

**ZDRAVJE DELOVNO  
AKTIVNE POPULACIJE**

**HEALTH  
OF THE WORKING-AGE  
POPULATION**

**Zbornik  
povzetkov z recenzijo  
Book of Abstracts**

Edited by Ana Petelin



**Uredniški odbor Založbe Univerze na Primorskem**

Gregor Pobežin, *UP Fakulteta za humanistične študije*

Maja Meško, *UP Fakulteta za management*

Vito Vitrih, *UP FAMNIT in UP IAM*

Silva Bratož, *UP Pedagoška fakulteta*

Matej Vranješ, *UP Fakulteta za turistične študije – Turistica*

Ana Petelin, *UP Fakulteta za vede o zdravstvu*

Janko Gravner, *University of California, Davis*

Krstivoje Špijunovič, *Učiteljski fakultet Užice*

Miloš Zelenka, *Jihočeská univerzita v Českých Budějovicích  
in Univerzita Konštantína Filozofa v Nitre*

Jonatan Vinkler, *Založba Univerze na Primorskem*

Alen Ježovnik, *Založba Univerze na Primorskem*

---

*zdravje delovno aktivne populacije*  
*health of the working-age population*



Univerza na Primorskem • Fakulteta za vede o zdravju  
Università del Litorale • Facoltà di scienze della salute  
University of Primorska • Faculty of Health Sciences

Dogodek je bil izveden v okviru projekta

»Podaljševanje delovne aktivnosti in zmanjševanje odsotnosti z dela v KRZS – STAR-VITAL:  
Združeni ukrepi za vitalnost starejših delavcev«



EVROPSKA UNIJA  
EVROPSKI  
SOCIALNI SKLAD  
NALOŽBA V VAŠO PRIHODNOST



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA DELO, DRUŽINO,  
SOCIALNE ZADEVE IN ENAKE MOŽNOSTI



Projekt »Podaljševanje delovne aktivnosti in zmanjševanje odsotnosti z dela v KRZS – STAR-VITAL: Združeni ukrepi za vitalnost starejših delavcev«. Naložbo financirata Evropska unija, in sicer iz Evropskega socialnega sklada ter Republika Slovenija, in sicer Ministrstvo za delo, družino, socialne zadeve in enake možnosti. Naložba se izvaja v okviru Operativnega programa za izvajanje Evropske kohezijske politike v obdobju 2014 – 2020, v okviru 8. prednostne osi: »Spodbujanje zaposlovanja in transnacionalna mobilnost delovne sile«, 8.3. prednostne naložbe: »Aktivno in zdravo staranje«, 8.3.1. specifičnega cilja »Podaljševanje in izboljšanje delovne aktivnosti starejših, vključenih v ukrepe«.

Ostali partnerji projekta



Nacionalni inštitut  
za javno zdravje



Fakulteta za zdravstvo **Angele Boškin**  
*Angela Boškin Faculty of Health Care*

Zdravje delovno aktivne  
populacije  
*Health of the Working-Age  
population*

---

4. znanstvena in strokovna konferenca  
z mednarodno udeležbo  
4<sup>th</sup> scientific and professional  
international conference

Zbornik povzetkov z recenzijo  
Book of Abstracts





# Vsebina Content

- 7**      **UVODNE MISLI**  
**PREFACE**
- 8      Zdravje delovno aktivne populacije
- 9      Health of the working age population
- 11**     **PROGRAM KONFERENCE**  
**CONFERENCE PROGRAMME**
- 23**     **VABLJENI PREDAVATELJI**  
**INVITED LECTURERS**
- 29**     **PLENARNA PREDAVANJA**  
**PLENARY LECTURES**
- KONFERENČNI POVZETKI**  
**CONFERENCE ABSTRACTS**
- 39**     **SEKCIJA/SECTION**  
**FIZIOTERAPEVTSKE IN KINEZILOŠKE PRILOŽNOSTI**  
**PRI DELOVNO AKTIVNI POPULACIJI**  
**OPPORTUNITIES IN PHYSIOTHERAPY AND KINESIOLOGY**  
**FOR THE WORKING-AGE POPULATION**
- 59**     **SEKCIJA/SECTION**  
**OHRANJANJE IN KREPITEV ZDRAVJA DELOVNO AKTIVNE POPULACIJE**  
**MAINTAINING AND PROMOTING HEALTH OF THE WORKING-AGE**  
**POPULATION**

- 133**    **SEKCIJA/SECTION**  
**PREHRANA IN HIDRACIJA DELOVNO AKTIVNE POPULACIJE**  
**NUTRITION AND HYDRATION OF THE WORKING-AGE POPULATION**
- 165**    **SEKCIJA/SECTION**  
**UPORABA IKT NA PODROČJU ZDRAVJA DELOVNO AKTIVNE**  
**POPULACIJE**  
**USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES**  
**IN HEALTH OF THE WORKING-AGE POPULATION**
- 191**    **POSTERJI**  
**POSTER PRESENTATIONS**



# Uvodne misli

## Preface

---

# Zdravje delovno aktivne populacije

Fakulteta za vede o zdravju je v letu 2017 prvo konferenco z naslovom *Zdravje delovno aktivne populacije* sklenila v upanju, da smo pripomogli k povečanju ozaveščenosti o zdravih vedenjskih navadah in možnostih preprečevanja kroničnih nenalezljivih bolezni pri delavcih različnih starosti in poklicev, ter spodbudili nadaljnje strokovno in raziskovalno delo na tam področju.

K organizaciji konference prispeva v tem letu tudi projekt *STAR-VITAL: Združeni ukrepi za vitalnost starejših delavcev*, v okviru katerega raziskovalci Univerze na Primorskem skupaj z Nacionalnim inštitutom za javno zdravje, Obrtno-podjetniško zbornico Slovenije in Fakulteto za zdravstvo Angele Boškin snujejo in izvajajo podjetju prilagojene ukrepe na področjih ergonomije, obvladovanja stresa, komunikacije, prehrane in podaljševanja delovne aktivnosti. Vizija projekta je vzpostavljanje zdravega delovnega mesta, tako da zaposleni in delodajalec sodelujeta pri aktivnostih varovanja in promocije zdravja, s čimer se na dolgi rok zagotavlja trajnostna delovna mesta ter zdravje in dobro počutje zaposlenih.

Konferenca je razdeljena na štiri vsebinske sklope, s čimer želimo spodbuditi povezovanje in izmenjavo znanja strokovnjakov sorodnih strok. Študije na različnih populacijah, od otrok, delovno aktivne populacije ter vse do starostnikov kažejo, da je za spodbujanje zdravja potrebno zagotoviti celostno obravnavo z vseh ključnih vidikov – telesne dejavnosti, prehrane, preprečevanje stresa in drugih. Zato si želim, da bi konferenca ponudila ali vsaj nakazala tudi odgovore na vprašanja kot so, 'Kako uporabiti informacijsko-komunikacijske tehnologije, da delavca spodbudimo k gibanju?' ali 'Kako zasnovati aktivni odmor na delu, da bo poleg razbremenitve kostno-mišičnega sistema pripomogel tudi k zmanjšanju stresa?'

Upam, da bo konferenca raziskovalcem, visokošolskim učiteljem, študentom in strokovnjakom ponudila širok pogled na problematiko zdravja delovno aktivne populacije, in jih spodbudila k raziskovalnemu, strokovnemu in razvojnemu delu na tem področju. Čeprav se v zadnjih letih zavedanje o tej problematiki dviguje in obenem rasteta tako količina kot kakovost projektov, storitev in aktivnosti nasploh, bo potrebno še veliko dela, da delavcem zagotovimo kar najboljše možno delovno okolje.

# Health of the working age population

In 2017, the Faculty of Health Sciences concluded the first conference entitled *Health of the Working-Age Population* with optimism, believing that we had contributed to the increase in awareness on healthy lifestyle habits and opportunities to prevent chronic non-communicable diseases in workers of different ages and professions, and encouraged further professional and scientific work on this topic. This year's conference is co-organized by the project *STAR-VITAL: Joint measures for the vitality of older workers*. Within this project, the researchers from University of Primorska, alongside with National Institute for Public Health, Chamber of Craft and Small Business of Slovenia, and Angela Boškin Faculty of Healthcare, design and implement interventions on in view of ergonomics, stress management, communication, nutrition and increasing the working year span. The vision of the project is to establish healthy workplaces, by promoting cooperation between employers and employees.

The conference is split into four sections, with the aim to encourage the communication and exchange of knowledge among the experts of similar backgrounds. At the same time, we must be aware that cooperation among different fields is also of paramount importance. Studies that had explored different populations, from children, working-age population and elderly, have shown that health and well-being is best promoted with comprehensive approach, involving physical activities, appropriate nutrition, stress management and so forth. Therefore, I hope that the conference will also offer or at least move us closer to the answers like "How to use information-communication technology to promote physical activity during work" or "How to design active workplace break in a way that it will, in addition to unloading the musculoskeletal system, also contribute to stress relief?"

I hope that the conference will offer the researchers, professors, students and experts a broad overview on the issues related to the health of the working-age population, and inspire them to research, development and professional work on this field. Although we have seen important progress in recent years, both in terms of research/project work, as well as other activities intended for workplace health promotion, there is nevertheless more work to be done to ensure the workers best possible workplace environment.



# **Program konference** **Conference Programme**

---

## PLENARNA PREDAVANJA PLENARY LECTURES

Uporaba IKT za spodbujanje aktivnega življenja  
in zdravega življenjskega sloga delovno aktivne populacije  
The use of ICT for active living and healthy lifestyle promotion  
of the working population  
*Marko Bajec* 30/31

Zdravstvene težave staršev dolgotrajno hospitaliziranih otrok  
Health problems experienced by parents of kids in long-term hospitalisation  
*Maria de Lurdes Lopes Freitas Lomba, Rafaela Oliveira, Inês da Luz Abreu,  
Ruben Pinto, Rodrigo Rato, Sofia Macedo* 32/33

Preprečevanje bolečine v spodnjem delu hrbta na delovnem mestu:  
kako zmanjšati obremenitev hrbtenice pri delavcih  
Low back pain prevention at the workplace:  
how to reduce spine loading in workers  
*Kingma Idsart* 34/35

Opolnomočiti in pritegniti delovno silo v zdravstvu:  
rezultati longitudinalne raziskave in kaj smo se pri tem naučili  
Empower and Engage the Healthcare Workforce: Findings of a Longitudinal  
Study and Lessons Learned  
*Peter Van Bogaert* 36/37

### **SEKCIJA Fizioterapevtske in kineziološke priložnosti pri delovno aktivni populaciji SECTION Opportunities in physiotherapy and kinesiology for the working-age population**

Stres na delovnem mestu kot možen dejavnik tveganja za srčno-žilne bolezni  
(VABLJENO PREDAVANJE)  
Work related stress as a potential risk factor for cardiovascular diseases  
(INVITED LECTURE)  
*Mladen Gasparini* 40/41

Povezanost gibalne aktivnosti in indeksa delovne učinkovitosti  
pri zaposlenih v vrtcu  
Relationship between physical activity and work efficiency among  
kindergarten employees  
*Anja Andrenšek, Matej Plevnik* 42/43

Kolikšen delež slovenskih policistov dosega smernice za gibanje in spanje?  
Proportion of Slovenian police officers meeting daily activity behaviours  
guidelines  
*Kaja Kastelic, Nastja Podrekar, Jure Žitnik, Nejc Šarabon* 44/45

Travmatski izpahi ramena pri starejši aktivni populaciji  
Shoulder traumatic luxation in elderly active population  
*Benjamin Marjanovic, Jakob Merkač, Marko Nabergoj, Samo Novak* 46/47

Ali lahko zmanjšamo tveganje za popoškodbeno obrabo kolena?  
Can we lower the risk of injury-related knee osteoarthritis?  
*Marko Nabergoj, Samo Novak, Jakob Merkač, Benjamin Marjanovič* 48/49

Odnos med nekaterimi vidiki duševnega zdravja, izgorelostjo in športno rekreacijo pri zaposlenih v zdravstveni negi  
Relationship between some aspects of mental health, burnout and sports recreation among health care workers  
*Marko Petrovič, Petra Dolenc* 50/51

Medgeneracijski planinski projekt »Z roko v roki gor na vrh« v vrtcu  
Intergenerational mountaineering project „Hand in hand up to the top“ in preschool  
*Tanja Plevnik Peternelj* 52/53

Vpliv 8-tedenske intervencije na gibalne, telesne in psihične dejavnike žensk s prekomerno maso  
The impact of 8-week intervention on motor, physical and psychological factors for overweight women  
*Ana Šuštaršič, Mateja Videmšek, Maja Dolenc, Damir Karpljuk, Vedran Hadžić* 54/55

Povezanost telesne aktivnosti v srednjem obdobju življenja s tveganjem za demenco  
Relation between middle age physical activity and risk of dementia  
*Monika Zadnikar, Danielle Jagodic* 56/57

**SEKCIJA Ohranjanje in krepitev zdravja delovno aktivne populacije**  
**SECTION Maintaining and promoting health of the working-age population**

Evropski kodeks proti raku naj ne obvisi v zraku: manj raka v delovno aktivni populaciji (VABLJENO PREDAVANJE)  
The European Code Against Cancer exploitation: less cancer in working-age population (INVITED LECTURE)  
*Urška Ivanuš* 60/61

Z gibanjem se sprostim in lažje učim  
Exercising helps me relax and teach more easily  
*Vesna Boštjančič* 62/63

Vadba za dobro počutje in zdravo telo – primer dobre prakse gibalne vadbe za zaposlene Exercise for health and well-being – good practice example of physical exercise for employees <i>Vesna Boštjančič</i>	64/65
Študij - priložnost za znanje in dobro počutje delovno aktivne populacije Study - opportunity for knowledge and well-being of the working-age population <i>Natalija Brečko</i>	66/67
Raziskovalna dela izrednih študentov na področju prehrane in zdravja Research tasks of part time-students on the nutrition and health topic <i>Natalija Brečko</i>	68/69
Vloga komunikacije za spodbujanje dobrega počutja v zdravstvenem timu: presečna raziskava Role of Communication to Promote Well-being in the Healthcare team: Cross-sectional Study <i>Mihela Čeč, Nastja Podrekar</i>	70/71
Brezplačni interventni programi v podporo družini in posameznikom v stiski Free interventions to support families and individuals in need <i>Nataša Demšar Pečak</i>	72/73
Izmensko delo medicinskih sester: vpliv na zdravje Nurses' shift work: impact on health <i>Lidija Dornik</i>	74/75
Kostno-mišična obolenja vzgojiteljev predšolskih otrok Musculoskeletal disorders among preschool teachers <i>Jera Gregorc, Mira Dolenc</i>	76/77
Poznavanje vina kot dejavnik varnega uživanja vina pri mladostnikih Knowledge about wine as a factor of safe use of wine among young population <i>Jurij Gunzek</i>	78/79
Z dokazi podprta izbira katetra za intermitentno samokatetrizacijo: Integrativni pregled literature Evidence-based catheter selection for intermittent self-catheterization: Integrative review <i>Tjaša Hrovat Ferfolja, Melita Peršolja</i>	80/81
Celiakija – izkušnje pacientov Celiac disease - patient experiences <i>Manca Košelnik, Mateja Bahun</i>	82/83



Stališča zaposlenih do usklajevanje poklicnega in zasebnega življenja: študija primera Employee attitudes towards work-life balance: A case study <i>Maja Krajnc</i>	84/85
Struktura družine, obšolske kulturne aktivnosti v OŠ ter zdravje mladih v Sloveniji Family structure, school extracurricular cultural activities and health of Slovenian young people <i>Danijela Lahe, Tina Cupar, Andrej Kirbiš</i>	86/87
Percepcija varnosti cepiva proti gripi med delovno aktivno in neaktivno populacijo v Sloveniji Influenza vaccine safety perception among working and non-working Slovenians <i>Monika Lamot, Andrej Kirbiš</i>	88/89
Povezanost vadbe dihanja in oceno kakovosti življenja pri odraslih – integrativni pregled literature Relationship between breathing exercises and quality of life in adults – a literature review <i>Eva Lenart, Karin Vrtar, Ana Benedik, Petra Zajc, Sabina Ličen, Milan Hosta, Matej Plevnik</i>	90/91
Egalitarno distribuirano ohranjanje zdravja s pomočjo tehnologij podaljševanja življenja Egalitarian distribution of health maintenance using technologies for life extension <i>Martin Lipovšek</i>	92/93
Zaposlovanje starejših deluje v prid raznolikosti in kakovosti družbe Hiring older people as a way to increase diversity and improve the quality of society <i>Marjeta Logar Čuček</i>	94/95
Zdravje in počutje medicinskih sester v slovenskih bolnišnicah Nurses' well-being and health in Slovenian hospitals <i>Mateja Lorber, Sonja Treven, Damijan Mumel</i>	96/97
Uporabnost Moiré topografije za oceno sprememb drže na delovnem mestu The applicability of Moiré topography to assess changes in posture in the workplace <i>Sandra Martinuč, David Ravnik</i>	98/99
Staranje na oddaljenih področjih alpskega sveta in zadrževanje delovne sile – mnenje deležnikov Ageing in the remote area of Alpine Spaces and retention of workforce – stakeholders opinion <i>Andreja Meziniec, Monika Robnik, Ria Jagodic, Luka Krongger, Mojca Gabrijelčič Blenkuš</i>	100/101

Ergonomska ocena obremenitev na izbranih delovnih mestih v livarni Ergonomic assessment and load management interventions for selected workplaces in a steel factory <i>David Mlakar</i>	102/103
Poškodbe z ostrimi predmeti med zdravstvenimi delavci: Kako ravnati? Injuries from sharp objects between health professionals: How to deal with it? <i>Helena Olenik, Damir Hećimović</i>	104/105
Kako lahko okolje vrtca prispeva k zdravju staršev? How can kindergarten environment contribute to parents' health? <i>Tanja Plevnik Peternejl</i>	106/107
Stres in z njim povezani stresorji med slovenskimi policisti Stress and Associated Stressors in Slovenian Police Officers <i>Nastja Podrekar, Kaja Kastelic, Jure Žitnik, Nejc Šarabon</i>	108/109
Analiza zdravstvenega absentizma v Sloveniji od leta 2015 do leta 2019 Analysis of health-related workplace absenteeism in Slovenia from 2015 to 2019 <i>Ticijana Prijon, Nina Pirnat, Ivan Eržen</i>	110/111
Z delom povezana kostno-mišična obolenja v Sloveniji v obdobju 2015–2018 Work-related musculoskeletal disorders in Slovenia: 2015 – 2018 <i>Ticijana Prijon, Dorjana Zerbo Šporin, Nejc Šarabon, Ivan Eržen</i>	112/113
Perceptions of physical activity interventions in a worksite in a Slovene company – a qualitative exploration study within the Star Vital project Perceptions of physical activity interventions in a worksite in a Slovene company – a qualitative exploration study within the Star Vital project <i>Martin Schultze, Klemen Širok</i>	114/115
Izvajanje promocije zdravja in učinki telesne dejavnosti na zmanjševanje izgorelosti pri učiteljih Implementation of health promotion and the effects of physical activity on burnout reduction of pedagogical workers <i>Urška Simnovčič Pišek, Miha Marinšek</i>	116/117
Pomen socialnih determinant za zdravje brezposelnih žensk: kvalitativna raziskava The importance of social determinants for health of unemployed women: a qualitative research <i>Gordana Šokić, Mirko Prosen</i>	118/119
Ukrepi za podaljšanje delovne sposobnosti zaposlenih v institucionalnem varstvu starejših Measures to extend the working capacity of employees in the institutional care of the elderly <i>Nataša Štandeker, Bojana Filej, Nadja Plazar</i>	120/121

Poučevanje na daljavo: zaznavanje stresa, psihološko zdravje in zadovoljstvo z delom pri učiteljih  
Distance learning: perceived stress, psychological health and work satisfaction among teachers  
*Janja Tekavc, Pia Novak* 122/123

Vadba na delovnem mestu: Sistematični pregled  
Exercise at the workplace: A systematic review  
*Nikola Todorovic, Valdemar Štajer, Nebojša Maksimović, Darinka Korovljević, Sergej Ostojić* 124/125

Vpliv različnih položajev med opravljanjem pisarniškega dela na aktivnost mišic ramenskega obroča  
The effect of various postures during office task work on shoulder girdle muscle activity  
*Tadej Vogrič, Matej Voglar* 126/127

Promocija aktivnosti za preprečevanje kostno-mišičnih obolenj in psihosocialnih tveganj pri delu  
Promotion of activities to prevent musculoskeletal disorders and psychosocial risks in the workplace  
*Dorjana Zerbo Šporin, Ticijana Prijon, Nejc Šarabon* 128/129

Vpliv telesne aktivnosti na zdravje delovno aktivne populacije  
The influence of physical activity on health of the working-age population  
*Anton Zupan, Mitja Slapar* 130/131

## **SEKCIJA Prehrana in hidracija delovno aktivne populacije** **SECTION Nutrition and hydration of the working-age population**

Vloga prebiotikov in probiotikov po gastrointestinalnih kirurških posegih (VABLJENO PREDAVANJE)  
The role of prebiotics and probiotics after gastrointestinal surgery (INVITED LECTURE)  
*Zdravko Štor* 134/135

Prehranski polifenoli in njihov vpliv na črevesno mikrobioto in zdravje ljudi  
Dietary polyphenols and their effect on the gut microbiota and human health  
*Katja Bezek, Darja Barlič – Maganja* 136/137

Slabše prehranjevalne navade v času karantene  
Poorer diet quality during quarantine  
*Nives Bogataj, Karin Novak, Zala Jenko Pražnikar, Nina Mohorko* 138/139

Vpliv uživanja sladoleada s probiotikom na število kariogenih bakterij v slini zdravih odraslih  
The effect of probiotic ice cream consumption on salivary cariogenic bacteria in healthy adults  
*Dominika Češek, Katja Bezek, Boris Kovač* 140/141

Znanje športne prehrane slovenskih rekreativnih športnikov Sports nutrition knowledge of Slovenian recreational athletes <i>Eva Gorup, Nina Mohorko</i>	142/143
Ugotavljanje prehranjevalnih navad delovno aktivne populacije Assessing the eating habits of the working population <i>Magda Guček</i>	144/145
Pomanjkanje in sezonsko nihanje vitamina D pri odraslih Slovencih Vitamin D deficiency and seasonal variation among Slovenian adult population <i>Maša Hribar, Hristo Hristov, Matej Gregorič, Urška Blaznik, Katja Zaletel, Adrijana Oblak, Joško Osredkar, Anita Kušar, Katja Žmitek, Irena Rogelj, Igor Pravst</i>	146/147
Energijski vnos in energijska razpoložljivost vzdržljivostnih športnikov Energy intake and energy availability endurance athletes <i>Tadeja Jakus, Mihaela Jurdana, Zala Jenko Pražnikar</i>	148/149
Zagotavljanje varne priprave živil med slovenskimi potrošniki Ensuring food safety among Slovenian consumers <i>Mojca Jevšnik, Lucija Pirc, Karmen Godič Torkar</i>	150/151
Evalvacija jedilnikov podjetja na Štajerskem Evaluation of menus in a company in Styria <i>Anja Kerec</i>	152/153
Poznavanje in navade uživanja kislega zelja in repe med Slovenci Sauerkraut and sour turnip consumption habits in Slovenia <i>Martina Nagode, Katja Bezek</i>	154/155
Vpliv uživanja kefirja in mleka na črevesno prepustnost The effect of kefir and milk intake on intestinal permeability <i>Karin Novak, Zala Jenko Pražnikar, Ana Petelin</i>	156/157
Prehranjevalne navade zaposlenih na različnih delovnih mestih Eating habits of employees from different working places <i>Mojca Stubelj, Simona Perčič, Matija Vodopivec</i>	158/159
Prehranska avtonomija družine v obdobju izrednih razmer Family Food Autonomy in Extraordinary Circumstances <i>Petra Vodopivec Kolar, Irena Hren</i>	160/161
Energijska bilanca pri slovenskih policistih Energy Balance in Slovenian Police Officers <i>Jure Žitnik, Kaja Kastelic, Nastja Podrekar, Nejc Šarabon</i>	162/163

**SEKCIJA Uporaba IKT na področju zdravja  
delovno aktivne populacije  
SECTION Use of information and communication  
technologies in health of the working-age population**

Izbira je preprosta, z mobilno aplikacijo "Veš, kaj ješ?" (VABLJENO PREDAVANJE) Informed choice is easy with "Veš, kaj ješ?" mobile application (INVITED LECTURE) <i>Anja Bolha, Nika Kremić</i>	166/167
Uporaba informacijsko telekomunikacijske tehnologije pri osebah z astmo Use of information telecommunications technology in asthma subjects <i>Tilen Dolinar, Lidija Jakupović, Urška Ugovšek, Andrej Starc</i>	168/169
Uporaba mobilne tehnologije v zdravstvu Use of mobile technology in healthcare <i>Grega Martin Glas, Sara Hafner, Špela Rozman, Andrej Starc</i>	170/171
STAR-VITAL WIKI: Repozitorij ukrepov promocije zdravja na delu STAR-VITAL WIKI: Workplace Well-Being Measures Repository <i>Urška Jerman, Klemen Širok</i>	172/173
SLOfit zaVse SLOfit forAll <i>Gregor Jurak, Bojan Leskošek, Gregor Starc</i>	174/175
Uporaba informacijsko-komunikacijske tehnologije pri srčnih bolnikih Use of information and communication technology in cardiac patients <i>Matej Korošec, Žiga Metelko, Tatjana Somi, Andrej Starc</i>	176/177
Vloga informacijsko komunikacijske tehnologije pri samovodenju sladkorne bolezni tipa 2 The role of information and communication technology in self-management of type 2 diabetes <i>Filip Krajnc, Maruša Magister, Klara Nartnik, Andrej Starc</i>	178/179
Uporaba nadgrajene resničnosti za izobraževanje laične populacije pri temeljnih postopkih oživljanja Use of augmented reality in education of lay population in basic life support <i>Davorin Marković, Andrej Starc, Neli Kocijančič, Eva Ferjančič</i>	180/181
Portal zVEM - varno stičišče storitev eZdravja in zdravstvene dokumentacije zVEM Portal - a Safe Hub for eHealth Services and Medical Documentation <i>Živa Rant, Jure Janet, Dalibor Stanimirovič</i>	182/183

STAR-VITAL projekt: Dejavniki zagotavljanja participacije  
v programih promocije zdravja  
STAR-VITAL project: Factors for ensuring participation  
in health promotion programs  
*Natalija Rozman, Klemen Širok* 184/185

Uporaba informacijsko komunikacijske tehnologije pri vodenju  
diabetesa tipa I  
Type I Diabetes Management Using Information Communication Technology  
*Eva Skočir, Tereza Sever, Tadeja Vidmar, Andrej Starc* 186/187

Vpliv informacijsko komunikacijske tehnologije na kakovost življenja  
delovno aktivne populacije  
The impact of information-communication technology on the quality  
of life of the working-age population  
*Mitja Slapar, Anton Zupan* 188/189

## **PREDSTAVITEV POSTERJEV POSTER PRESENTATIONS**

Indirektni psihosocialni dejavniki tveganja za zdravje zaposlenih v bolnišnici  
Indirect psycho-social factors of hospital health risks  
*Jana Bizjak, Melita Peršolja* 192/193

Uživanje probiotikov pri gibalno/športno aktivni populaciji  
Probiotics consumption in physically active individuals  
*Dominika Češek, Katja Bezek, Mihaela Jurdana* 194/195

Kakovost življenja delovno sposobnih ljudi po možganski kapi  
v okviru poklicne dejavnosti  
The quality of life of working-age people after stroke  
in the context of professional activity  
*Božena Kowalczyk, Božena Zawadzka, Bogumiła Lubińska-Żądło* 196/197

Uporaba IKT rešitev za zdrav življenjski slog delovno aktivne populacije  
v času pandemije COVID-19  
Use of ICT solutions for a healthy lifestyle of the working population  
during the COVID-19 pandemic  
*Matjaž Likar, Elena Likar* 198/199

Pomanjkanje spanja v povezavi z delazmožnostjo medicinskih sester  
Lack of sleep connection with the workability of nurses  
*Melita Peršolja, Anamarija Mišmaš, Mihaela Jurdana* 200/201

Direktni psihosocialni dejavniki tveganja za zdravje zaposlenih v bolnišnici  
Direct psychosocial health risk factors in hospital employees  
*Tanja Rus, Melita Peršolja* 202/203

- Biokemijski in hematološki parametri pri zaznavi stopnje ledvične okvare:  
učinki na zmožnosti dela  
Biochemical and hematological parameters in determination of renal disease:  
effects on work ability  
*Damir Suljević, Lejla Klepo, Muhamed Fočak* 204/205
- Depresija in delovanje kronično bolnih oseb v domačem okolju  
v smislu samopostrežbe  
Depression of the Chronically Ill Elderly and Their Functioning in Domestic  
Environment Concerning Self-Service  
*Stanisława Talaga, Sara Stanczak, Dominika Źądło* 206/207
- Projekt STAR-VITAL:  
Preliminarni rezultati glede stresa in spanja pri zaposlenih  
STAR-VITAL project:  
Preliminary results regarding employee stress and sleep  
*Matija Vodopivec, Ana Arzenšek* 208/209
- Poklicna in telesna dejavnost nosečnic  
Professional and physical activity of pregnant women  
*Bogumiła Lubińska-Źądło, Patrycja Szubryt, Bożena Kowalczyk* 210/211





**Vabljeni  
predavatelji  
Invited lecturers**

---



**M**arko Bajec je redni profesor na Fakulteti za računalništvo in informatiko Univerze v Ljubljani. Je vodja Laboratorija za podatkovne tehnologije in lot Demo Centra. Raziskovalno in aplikativno se ukvarja s podatkovno intenzivnimi sistemi, njihovim razvojem in obvladovanjem, predvsem v kontekstu pametnih mest. Sodeloval je pri razvoju različnih podatkovnih platform, vključno s platformo za mobilno in elektronsko zdravstvo, platformo za analizo medijev, platformo za simulacijo in upravljanje prometa itd. V zadnjem času se veliko ukvarja z razvojem podpore za razpoznavo in sintezo slovenskega govora. V svoji karieri je vodil ali koordiniral več kot 30 raziskovalnih in aplikativnih projektov ter prejel več priznanj in nagrad za prenos znanja v prakso.

*Marko Bajec, PhD, is a full Professor of computer science at the Faculty of Computer & Information Science, University of Ljubljana. He is the Head of the Laboratory for Data Technologies and lot Demo Center. His research interests are primarily focused on the development of data intensive systems and their governance with smart city initiatives and wider. He has contributed to the development of various data platforms that support different scenarios, including electronic and mobile health, media analysis, traffic simulation and management. Recently he has been involved in the development of systems for automatic speech recognition and synthesis of Slovenian language. In his career, Bajec has led or coordinated over 30 research and development projects and received several awards and recognitions for his contribution to transferring knowledge to industry.*



*Idsart Kingma* dela kot izredni profesor na Oddelku za znanost o gibanju človeškega telesa na Univerzi Vrije v Amsterdamu na Nizozemskem. Pedagoško deluje na področju biomehanike in patologije mišično-skeletnega sistema. Je (so)avtor več kot 180 znanstvenih člankov in mentor 19-im doktorskim študentom. Več kot polovica njegovih del se nanaša na biomehaniko hrbtenice v povezavi z bolečinami v spodnjem delu hrbta tako z uporabo "in vivo" kot tudi "in vitro" metod. Trenutno je njegovo osrednje raziskovalno delo usmerjeno v razvoj in testiranje zunanjih mehanskih podpor spodnjega dela hrbta (eksoskeletov). Poleg že omenjenih je objavil tudi številna dela o nadzoru drže, športnih poškodbah in športni biomehaniki.

*Idsart Kingma* works as an associate professor at the Department of Human Movement Sciences, Vrije Universiteit, Amsterdam, the Netherlands. He teaches courses on biomechanics and pathology of the musculoskeletal system. He (co)authored over 180 scientific papers and he supervised 19 PD students. Over 50% of his work concerns spine biomechanics in relation to low back pain, using both in vivo and in vitro methods. A current main focus is on the development and testing of exoskeletons to support the low back. Additionally, he published work on postural control, sports injuries and sports biomechanics.



**M**aria de Lurdes Lopes de Freitas Lomba je doktorica znanosti na področju zdravstvene nege, z znanstvenim magisterijem iz področja javnega zdravja. Na zdravstveni fakulteti, smer zdravstvena nega, je diplomirala leta 1989 s specializacijo iz zdravja otrok in pediatrične zdravstvene nege. Kot izredna profesorica je zaposlena na zdravstveni fakulteti v Coimbri na Portugalskem. Je raziskovalka v enoti za zdravstveno nego na fakulteti ter trenutno koordinira dva raziskovalna projekta. Je predsednica Chapterja Phi Xi – Sigma Theta Tau international, pridružena urednica številnih revij v zdravstveni negi, avtorica knjige, poglavij v monografijah in številnih znanstvenih člankih iz področja zdravstvene nege.

*Maria de Lurdes Lopes de Freitas Lomba has PhD in Nursing Sciences and Master in Public Health. She has a Degree in Nursing (1989) with specialization in Child Health and Pediatric Nursing. She is an adjunct teacher at Coimbra Nursing School (Portugal), researcher at the Health Research Unit coordinating two research projects, President of Chapter Phi Xi – Sigma Theta Tau international, Associate Editor, JBI Database of Systematic Reviews and Implementation Reports and Core-staff of The Joanna Briggs Institute -Portugal Centre for Evidence-Based Practice, Reviewer of international scientific journals and member of the organizing and scientific committee of national and international Nursing conferences. She has published several scientific papers and has authored 1 book and 8 book chapters.*



**P**eter Van Bogaert je zaključil dodiplomski študij zdravstvene nege, kasneje tudi magisterij in doktorat s področja medicinskih znanosti. Ima več kot 30 let delovnih izkušenj z delom v zdravstveni negi kot praktik, menedžer, direktor in raziskovalec. Od leta 2010 je vodja Katedre za babištvo in zdravstveno nego na Univerzi v Antwerpnu ter vodja Centra za raziskave in inovacije v zdravstveni skrbi (CRIC), kjer je zadolžen za razvoj in evalvacijo regionalnega, nacionalnega in mednarodnega znanstvenega sodelovanja. Kot visokošolski učitelj sodeluje na podiplomskem študijskem programu s področja babištva in zdravstvene nege. Vključen je tudi v številne druge aktivnosti povezane s kakovostjo in izboljšanjem nujenja zdravstvene nege in oskrbe. Usmerjajo se namreč na storitve zdravstvene nege in oskrbe ter s tem povezane izide, v vseh okoljih, kjer delujejo zdravstveni delavci. V tem kontekstu proučuje fizična in psihosocialna okolja zdravstvenih delavcev, ki vplivajo na izide zdravljenja pacienta, implementacijo inovacij za dvig kakovosti in varnosti pacientov ter vlogo menedžerjev zdravstvene nege v teh okoljih.

*Peter Van Bogaert is a registered nurse and received a bachelor degree in nursing sciences, master degree in sciences and doctoral degree in medical sciences. He has more than 30 year of experience in acute health care as a clinical nurse, a nurse manager, a director of nursing and a researcher. He is chair of the Department of Midwifery and Nursing Sciences and co-chair of a post-graduate program and chair of the international summer school Leadership in Nursing Excellence. He was a member of the Belgian Board of Quality of Nursing Care and member of the Nursing Quality Indicators for Reporting and Evaluation (NQuire) International Advisory Committee, Registered Nurses' Associations Ontario Canada. He is chair and co-chair of the CARE4 International Scientific Nursing and Midwifery Congress and co-chair of an International Meeting on Nursing Excellence: Magnet Recognition® in Europe Lesson Learned. Moreover, he is Fellow Ad Eundem Faculty of the Nursing and Midwifery Royal College of Surgeons in Ireland. Peter Van Bogaert research topics are focused within health services and outcomes research in all domains (acute care, mental health care, residential aged care and primary care) such a research program around nurse practice environments and psychosocial environments of healthcare workers related to various patient outcomes.*



**Plenarna  
predavanja  
Plenary lectures**

---

## Uporaba IKT za spodbujanje aktivnega življenja in zdravega življenjskega sloga delovno aktivne populacije

Marko Bajec

Univerza v Ljubljani, Fakulteta za računalništvo in informatiko, Večna pot 113,  
1000 Ljubljana, Slovenija

Posledice demografskega razvoja in še posebej staranja prebivalstva se kažejo na številnih področjih, med drugim pri delu, upokojevanju, pokojninah, medgeneracijskih transferjih, zdravju in stroških zdravljenja itn. Čeprav je aktivno in zdravo življenje tudi eden od razlogov za daljšanje življenjske dobe, s čimer povežemo nekatere izmed naštetih izzivov, pa je obenem predpogoj za ohranjanje zdrave družbe in skupaj z ustrezno rodnostjo največ prispeva k zagotavljanju ustreznega deleža delovno aktivne populacije. V predavanju se bom osredotočil na pomen sodobne informacijsko komunikacijske tehnologije (IKT) kot spodbujevalca k aktivnemu in zdravemu življenju. Uporabnost IKT bom demonstriral z opisom štirih projektov, pri katerih sem sodeloval in so bili s tem povezani. Prvi je imel naziv Ekosistem pametnega mesta ali krajše EkoSmart. To je bil v resnici program šestih projektov, od katerih so bili štirje povezani z elektronskim in mobilnim zdravstvom ter aktivnim in zdravim življenjem. Projekti so bili raziskovalno-razvojne narave in so rezultirali v pomembna izhodišča za razvoj konkretnih rešitev. Eno takih smo kasneje razvili v okviru projekta SOSTOP, kjer smo skupaj z nekaj drugimi podjetji in referenčnimi ambulantami vzpostavili in pilotno preskusili celovito platformo za oddaljeno spremljanje in telemedicinsko obravnavo bolnikov z nenalezljivimi kroničnimi boleznimi. V sodelovanju z inštitucijami, ki se ukvarjajo z medicino dela ter promocijo zdravja na delovnem mestu, smo rešitev kasneje nadgradili, tako da je primerna tudi za spodbujanje delovno aktivne populacije k aktivnemu in zdravemu življenjskemu slogu. Izsledke tega smo uporabili v projektu ZZZ, v katerem smo se posebej posvetili dvema podjetjema in s pomočjo različnih prijemov, povezanih z uporabo sodobne IKT, poskrbeli za ustrezno promocijo zdravja na delovnem mestu. Nazadnje bom predstavil še idejni projekt "Pametno zdravje", ki smo ga zasnovali skupaj s telekomunikacijskim podjetjem.

*Ključne besede:* informacijsko-komunikacijska tehnologija, oddaljeno spremljanje, pametno mesto, telemedicina



## The use of ICT for active living and healthy lifestyle promotion of the working population

Marko Bajec

University of Ljubljana, Faculty of computer and information science, Večna pot 113, 1000 Ljubljana, Slovenia

The consequences of the demographic development, and especially the aging of the population, are evident in different areas, including work, retirement, pensions, intergenerational transfers, health and healthcare costs, etc. Although active and healthy living is also one of the factors that extend the life expectancy, combined with some of the aforementioned challenges, it is at the same time a prerequisite for maintaining a healthy society and, in combination with adequate fertility, contributes the most to ensuring an adequate proportion of the working population. In this lecture, I will focus on the importance of modern information and communication technology (ICT) as a driver for an active and healthy life. The usefulness of ICT will be demonstrated through four projects in which I was involved related to this field. The first one, named The smart city ecosystem or Ekosmart was actually a programme, consisting of six projects related with electronic and mobile health and active and healthy life. In principle these were research and development projects, their results represented an important starting points for the development of concrete solutions. One of these was later developed as a part of the project SOSTOP, where a comprehensive platform for remote monitoring and telemedicine treatment of patients with non-communicable chronic diseases was implemented and piloted in collaboration with several companies and reference clinics. This was later upgraded in collaboration with institutions in the field of occupational health and workplace health promotion in order to be used active and healthy lifestyle promotion of the working-age population. The findings of this project were used in the project named ZZZ where in two companies, different approaches related to the use of modern ICT were properly applied in healthcare promotion activities. To conclude, a conceptual project called “Smart Health”, designed in collaboration with a telecommunications company.

*Key words:* information communication technology, remote monitoring, smart city, telemedicine

## Zdravstvene težave staršev dolgotrajno hospitaliziranih otrok

*Maria de Lurdes Lopes Freitas Lomba, Rafaela Oliveira, Inês da Luz Abreu, Ruben Pinto, Rodrigo Rato, Sofia Macedo*  
Coimbra Nursing School, Rua Quinta da Portela n. 91 2. esq, 3030 481 Coimbra, Portugalska

Uvod: Dandanes je aktivno vključevanje staršev pri hospitalizaciji otroka postala sprejeta praksa. Po drugi strani pa je malo znano in raziskano, kako tovrstna vključitev v zdravstveno oskrbo otroka vpliva na njihove finančne, socialne in osebne stroške, povezane s tem. Poleg tega je hospitalizacija otroka pogosto dogodek, ki se zgodi nepričakovano in ima pomemben vpliv tudi na zdravje staršev. Ugotovljeno je, da obstaja povezava med tesnobo, ki jo doživljata starša, in dolžino hospitalizacije otroka. Namen raziskave je tako raziskati in analizirati obstoječe dokaze o nekaterih zdravstvenih težavah, s katerimi se soočajo starši, ki imajo otroka v bolnišnici, v dolgotrajni zdravstveni obravnavi.

Metode: Uporabljen je bil intergrativni pregled literature. Znanstvene članke smo iskali s pomočjo baz podatkov, in sicer MEDLINE, SciELO in CINAHL. Kot vključitvene kriterije smo upoštevali starše otrok v dolgotrajni hospitalizaciji, stare med 0 in 18 let. Starši z znanim duševnim obolenjem ali motnjo so bili izključeni iz pregleda. Članke smo kritično ovrednotili s pomočjo šeststopenjske metode.

Rezultati: Otrokovo bivanje v bolnišnici ima velik vpliv na rutino in počutje družine. Starši so na nek način odvisni od zdravstvenih delavcev, katerim je glavni fokus otrokova dobrobit. Hospitalizacija otroka pogosto vodi v anksioznost, stres in motnje spanja pri starših. Ta stanja pa lahko sprožijo druga obolenja, kot so hipertenzija, debelost, diabetes tipa II ali celo srčni zastoj. Anksioznost je višja pri materah dojenčkov.

Razprava in zaključek: Dolgotrajna hospitalizacija otroka s seboj prinaša pomembne prilagoditve pri starših, kar lahko vpliva na njihovo zdravje in dobro počutje. Delo medicinske sestre naj bi vključevalo tudi delo s starši, predvsem prepoznavanje določenih znakov povezanih z njihovo stisko, da bi lahko pravočasno sprejeli ukrepe, ki bi, poleg oskrbe njihovih otrok, izboljšali proces prilagajanja in posledično dobro počutje staršev. Do zdaj je izpolnjevanje pričakovanj staršev dodatni izziv za medicinske sestre na pediatričnih oddelkih. Potrebne so dodatne raziskave o strategijah, ki jih starši uporabljajo pri dolgotrajni hospitalizaciji svojega otroka.

*Ključne besede:* dolgotrajna hospitalizacija, starši, anksioznost, stres, motnje spanja

## Health problems experienced by parents of kids in long-term hospitalisations

*Maria de Lurdes Lopes Freitas Lomba, Rafaela Oliveira, Inês da Luz Abreu, Ruben Pinto, Rodrigo Rato, Sofia Macedo  
Coimbra Nursing School, Rua Quinta da Portela n. 91 2. esq, 3030 481 Coimbra, Portugal*

**Background:** Parental participation now has become an accepted feature of the care of children in hospital. However, the financial, social and personal costs to parents of their involvement in the care of their hospitalized children have received little attention. On the other hand, a child's hospitalization is an event that occurs, in most cases, unexpectedly, having a significant impact on parents' health in such a way that there is a positive relationship between parental anxiety and the length of the child's hospitalization. **Aim:** To synthesize and analyse the existing evidence on the health problems experienced by parents of children in a long-term hospital stay.

**Method:** An on-line integrative review was carried out, using a literature search in three different health databases. Scientific articles were selected from MEDLINE, SciELO and CINAHL. Only parents of children (with ages between 0 and 18 years) submitted to long-term hospitalizations were included. Parents with any kind of mental or psychiatric disorder were excluded from the review. A six-step method was used to develop the revision and to analyse the results.

**Results:** A child's hospital stay holds major changes in the routines and well-being of a family. Parents present a need for care of themselves to nurses whose primary patients are children. Children's hospitalization causes their parents anxiety, which presents a much higher rate on mothers of male infants, as well as stress and sleep disorders in most cases. This condition can also lead to other pathologies such as hypertension, obesity, diabetes mellitus type II or stroke.

**Conclusion:** A long-term child's hospitalization requires their parents an enormous variety of changes, affecting their health and well-being. Thereby, nurses' interventions should focus on identifying the adversities experienced by the parents, improving the adaptation process and sharing care, in order to promote not only children well-being but their parents as well. Considering this, meeting family-centred care expectations is an additional paediatrics nurse challenge. Future studies on the strategies used by parents during their child's long-term hospitalization and its evaluation should be considered.

**Key words:** long-term hospital stay, parents, anxiety, stress, sleep disorders

## Preprečevanje bolečine v spodnjem delu hrbta na delovnem mestu: kako zmanjšati obremenitev hrbtenice pri delavcih

Idsart Kingma

Vrije Universiteit, van der Boechorststraat 9, 1081BT Amsterdam, Nizozemska

Bolečina v spodnjem delu hrbta (BSH) je resen družbeni problem s 37 % enoletno globalno prevalenco in je po vsem svetu vodilni vzrok invalidnosti. Pri pacientih z BSH se uporabljajo različni načini zdravljenja, ki imajo v najboljšem primeru, zmerne učinke. Poleg tega približno ena tretjina do ene polovice pacientov že v enem letu ponovno izkusi BSH. Zato se zdi, da je potrebno več pozornosti nameniti preventivi. Glede na to, da je mehanska obremenitev hrbtenice dejavnik tveganja za BSH, lahko preventivni ukrepi za zmanjšanje teh obremenitev pomagajo zmanjšati pojavnost BSH. Dvigovanje bremen povzroča kompresijske sile v hrbtenici, pri čemer se je pokazalo, da so te sile dovolj velike, da pri delu populacije lahko poškodujejo hrbtenico. Zato bi lahko zmanjšanje kompresijskih obremenitev hrbtenice med dvigovanjem učinkovito zmanjšalo tveganje za preobremenitve. Možni ukrepi za zmanjšanje kompresije hrbtenice so izboljšanje tehnike dvigovanja, ergonomski ukrepi ter uporaba dvižnih naprav in eksoskeletov. V zadnjih desetletjih smo izvajali študije o učinkih tehnik dvigovanja in o tem, kako se učinki spreminjajo v odvisnosti od značilnosti delovne naloge. Te študije kažejo, da je interakcija med tehniko dvigovanja in značilnostmi delovne naloge izjemno zapletena. Na primer, dobro znan nasvet »upognite kolena in ne hrbta« v nekaterih primerih zmanjša kompresijske obremenitve hrbtenice, v drugih pa jih celo poveča. Najboljši način izboljšanja tehnike dvigovanja je zagotavljanje povratnih informacij v dejanskem času med izvajanjem delovnih nalog. Povratne informacije naj temeljijo na mehanski obremenitvi in ne zgolj na preprostem pravilu dobre ali slabe tehnike. Ustrezni ergonomski ukrepi, lahko učinkovito zmanjšajo obremenitve hrbtenice, a se lahko učinki ukrepov delno izničijo s posameznikovo prilagojeno tehniko med dvigovanjem. Uvedba dvižnih naprav je bila na primer delno uspešna v zdravstvu a manj uspešna v industriji. Čeprav so tovrstne naprave učinkovite pri zmanjšanju obremenitev hrbtenice, je njihova uporaba omejena predvsem zaradi časovne zamudnosti dvigovanja s tako napravo v primerjavi z ročnim dvigovanjem bremen. Eksoskeleti so lahko boljša alternativa, saj so nošeni na telesu in so zato bolj vsestranski od »zunanjih naprav«. V zadnjih letih so bili storjeni številni koraki pri razvoju teh naprav. Pri EU projektu SPEXOR smo sodelovali s slovenskimi, nemškimi, avstrijskimi, belgijskimi in nemškimi partnerji, da bi preizkusili trenutne eksoskelete in izvedli naslednji korak v razvoju. Obstoječe naprave kažejo zmerne učinke na obremenitev hrbtenice. Pri projektu SPEXOR smo želeli razviti bolj zmogljive in vsestranske naprave. Učinki teh naprav na obremenitev hrbtenice so obetavni a je potrebno še veliko razvoja, preden bodo takšne naprave široko sprejete v delovnem okolju.

*Ključne besede:* bolečina v spodnjem delu hrbta, preprečevanje, dvigovanje, kompresija hrbtenice

## Low back pain prevention at the workplace: how to reduce spine loading in workers

*Idsart Kingma*

*Vrije Universiteit, van der Boechorststraat 9, 1081BT Amsterdam, Netherland*

Low back pain (LBP) is a major societal problem, with a global one-year prevalence of 37 %. Worldwide, LBP is the number one cause of disability. A wide variety of treatments is applied in patients with LBP, with moderate effects at best. Moreover, about one-third to half of the patients gets a new LBP episode within a year. Therefore, more focus on prevention seems needed. As mechanical loading of the spine is a risk factor for LBP, preventive measures to reduce these loads might help to reduce the incidence of LBP. Lifting causes high compression forces in the spine, and these forces have been shown to be high enough to cause damage to the spine in a part of the population. Therefore, reducing spine compression during lifting might be effective to reduce the risk of overloading. Possible measures to reduce spine compression are improvement in lifting technique, ergonomic measures, introduction of lifting devices, or the use of exoskeletons. In the last decades, we performed studies on effects of lifting technique, and how these effects interact with task conditions. These studies show that lifting technique interacts with task details in a complicated way. For instance, the well-known advice ‘bend your knees and not your back’ reduces spine compression in some conditions, but increases spine compression in other conditions. The best way to improve lifting technique would be to provide real time feedback during actual working conditions, with feedback based on mechanical rationale rather than a simple rule of right and wrong technique. Ergonomic measures, if feasible in the work environment, can effectively reduce spine loading, but these effects can be partially canceled by individual lifting behavior. Introduction of lifting devices has partially been successful in health care, but less so in industry. While such devices are mostly effective in reducing spine loading, their use is limited because commonly it takes much more time to lift with a device than by hand. Exoskeletons might be a better alternative, as these devices are body-worn, and thereby more versatile than ‘external’ devices. In recent years, substantial steps have been taken in development of these devices. In the EU project SPEXOR we collaborated with Slovenian, German, Austrian, Belgium, and German partners to test current exoskeletons and perform a next step in development. Existing devices show moderate effects on spine loading. In SPEXOR we aimed to develop devices that were stronger and more versatile. Effects of these devices on spine loading are promising. Yet substantial development is still needed before such devices are widely accepted on the work floor.

*Key words:* low back pain, prevention, lifting, spine compression

## **Opolnomočiti in pritegniti delovno silo v zdravstvu: rezultati longitudinalne raziskave in kaj smo se pri tem naučili**

*Peter Van Bogaert*

*Nursing and Midwifery Sciences, Centre for Research and Innovation in Care (CRIC), Faculty of Medicine and Health Sciences University of Antwerp Belgium, Universiteitsplein 1 B-2610 Wilrijk Antwerpen, Belgija*

Uvod: Delovna okolja in sistemi v zdravstvu in zdravstveni negi, ki so sposobni učenja, prilagajanja in izboljševanja svojega poslovanja bodo bistvenega pomena za soočanje s trenutnimi in bodočimi izzivi. Pred 15. leti je bil vzpostavljen raziskovalni program, katerega cilj je bil raziskati vpliv izboljšav v organizacijskem kontekstu zdravstvenega varstva in zdravstvene nege na delovno silo v teh sistemih kot tudi na paciente. Na dokazih utemeljene intervencije kot veliki in obsežni projekti, ki so del American Nurses Credentialing Center Magnet Recognition Program® vpeljujejo na primer bolj ploščato organizacijsko strukturo, participativni stil vodenja in pozitivno medpoklicno sodelovanje. Namen raziskave je bil preučiti povezanost med značilnostmi dela medicinskih sester povezanih z opolnomočenjem in zavzetostjo za delo, izgorelostjo, zadovoljstvom z delom, fluktuacijo in kakovostjo storitev, glede na demografske značilnosti.

Metode: V dveh učnih bolnišnicah v Belgiji je bila v obdobju 2015/15 in 2017/18 izvedena longitudinalna raziskava. Hierarhična regresijska analiza je ocenjevala jakost povezanosti z demografskimi značilnostmi, kot so starost (blok-1), spol in število otrok (blok-2), urnik dela in stopnja izobrazbe v zdravstveni negi ali babištvu (blok-3), tip oddelka (blok-4), obdobje merjenja (blok-5) in delovne značilnosti (blok-6) kot pojasnjevalne spremenljivke izgorelosti, delovne zavzetosti, zadovoljstva z delom in namere po zamenjavi službe (bolnišnica in poklic v zdravstveni negi) ter kakovosti oskrbe kot izhodnih spremenljivk.

Rezultati: Uravnoveženje delovnih značilnosti, vključno z delovno obremenitvijo, možnostjo odločanja in socialnim kapitalom, kaže na povezanost z nižjimi stopnjami izgorelosti in tveganjem za fluktuacijo, višjo stopnjo delovne zavzetosti in zadovoljstva z delom ter samo ocenjeno odličnost v zagotavljanju kakovosti oskrbe pri medicinskih sestrah in babicah. Pomembne razlike so bile ugotovljene med starostnimi kategorijami in različnimi oddelki.

Diskusija in zaključki: Uravnovežene delovne značilnosti ključnega pomena pri konfiguraciji delovnega sistema in močan pokazatelj počutja in zadovoljstva z delom in kakovosti oskrbe. Ti elementi omogočajo zdravstvenim delavcem spremljanje in oceno zdravstvenih ukrepov in organizacijskih sprememb. Spremembe so potrebne z izboljševanjem kakovosti, ki mora biti integrirana v vsakodnevne prakse s čimer se zagotavlja odličnost zdravstvene oskrbe, ki naslavlja pacientove potrebe.

Zaključki: Prakse v zdravstveni oskrbi potrebujejo dokaze in se ne smejo opirati samo na predpostavke. V osebo usmerjena zdravstvena oskrba zahteva usklajevanje medsebojnih ciljev na vseh organizacijskih ravneh.

*Ključne besede:* zdravstvo in delovna sila v zdravstveni negi, opolnomočenje, zavzetost, izgorelost, zadovoljstvo z delom, fluktuacija

## **Empower and Engage the Healthcare Workforce: Findings of a Longitudinal Study and Lessons Learned**

*Peter Van Bogaert*

*Nursing and Midwifery Sciences, Centre for Research and Innovation in Care (CRIC), Faculty of Medicine and Health Sciences University of Antwerp Belgium, Universiteitsplein 1 B-2610 Wilrijk Antwerpen Belgium.*

**Introduction:** Practice environments and work systems in healthcare and nursing that are able to learn, adapt and improve as business usual will be essential in order to face current and future challenges. A research program is set up since 15 year to investigate the impact of improvements in organizational context of healthcare and nursing practices on healthcare workforce and patient outcomes. Evidence-based Interventions as large-scale projects are underpinned on American Nurses Credentialing Center Magnet Recognition Program® such as flat organizational structure, participative management style and positive interdisciplinary collaborations.

**Aim:** To investigate associations between nurse work characteristics related to empowerment and work engagement, burnout as well as nurses' perception of job satisfaction, turnover intentions and care quality controlled for demographic characteristics.

**Study methods:** A longitudinal study based on survey data collected in two periods (2014/15 and 2017/18) was conducted in two academic acute care centers in Belgium. Hierarchical regression analysis estimated strength of associations with demographic characteristics such as age (block-1), gender and having children (block-2), work schedule and bachelor of sciences in nursing or midwifery (block-3), type of units (block-4), measurement period (block-5) and work characteristics (block-6) as explanatory variables of burnout, work engagement, job satisfaction and turnover intention (hospital and nursing profession) and quality of care as outcome variables.

**Study Results:** Balanced nurse work characteristics, including workload, decision latitude and social capital, were associated with lower levels of burnout and turnover intentions, higher levels of work engagement and job satisfaction and self-rated excellence of care quality in staff nurses and midwives. Relevant differences were identified between age categories and type of units.

**Discussion:** Balanced nurse work characteristics were found to be essential in work system configuration and strong indicators for professional wellbeing, job satisfaction and quality of care. These elements enabled healthcare professionals to monitor and evaluate care interventions and organizational changes. Changes are needed through quality improvements integrated in daily practices providing excellent care that address patient's needs.

**Conclusion:** Practices in care need evidence and not only rely on assumptions. Person-centered care need aligned mutual goals at all organizational levels.

**Key words:** Healthcare and Nursing Workforce, Empowerment, Engagement, Burnout, Job Satisfaction, Turnover Intentions.





**Konferenčni povzetki**  
**Conference abstracts**

**Sekcija/Section**

**Fizioterapevtske in kineziološke priložnosti  
pri delovno aktivni populaciji**  
**Opportunities in physiotherapy  
and kinesiology for the working-age  
population**

---

## Vabljeno predavanje Invited lecture

### Stres na delovnem mestu kot možen dejavnik tveganja za srčno-žilne bolezni

*Mladen Gasparini*

*Splošna bolnišnica Izola, Polje 40, 6310 Izola, Slovenija*

Izhodišča in namen: Srčno-žilne bolezni (SŽB) predstavljajo veliko zdravstveno breme saj so odgovorne za skoraj 50 % vseh smrti in za 25 % primerov invalidnosti pri delovno aktivni populaciji. Klasični modeli za napovedovanje tveganja za nastanek SŽB večinoma upoštevajo »običajne dejavnike tveganja«, kot so npr. sladkorna bolezen, arterijska hipertenzija, hiperlipidemija in starost. Ti dejavniki so soodgovorni za nastanek 60 % do 70 % vseh primerov SŽB. V ostalih primerih pa gre za vpliv nekaterih nekonvencionalnih dejavnikov tveganja kot so npr. stres, onesnaženost zraka, telesna neaktivnost, ki pa v zadnjem času pridobivajo na pomembnosti.

Predstavitev vsebine: Glede na to, da večina odrasle populacije preživi na delovnem mestu skoraj polovico budnega časa, postaja delovno mesto pomembno okolje v katerem so zaposleni izpostavljeni različnim oblikam stresa ta pa lahko negativno vpliva na nastanek SŽB. Na voljo je le malo eksperimentalnih študij, ki bi pojasnile povezavo med stresom na delovnem mestu in pojavom SŽB zato ugotovitve temeljijo v glavnem na opazovalnih študijah. Med pomembne mehanizme, ki lahko sprožijo pojav SŽB zaradi stresa spadajo motnje regulacije avtonomnega živčevja ter motnje v delovanju hipotalamo-hipofizne-nadledvične osi. Kot posledica teh disregulacij se lahko pojavijo kardiocirkulatorne in metabolne motnje, ki negativno vplivajo na srčno-žilni sistem tako, da pospešijo aterosklerotični proces ali celo sprožijo akutni srčno-žilni dogodek. Poleg neposrednega vpliva na kardiometabolne dejavnike lahko stres na delovnem mestu vpliva tudi na sprejemanje tveganih vedenj, kot so kajenje, telesna nedejavnost in neustrezna prehrana, ki še dodatno povečajo tveganje za SŽB. Ocena velikosti vpliva stresa na delovnem mestu na nastanek in napredovanje SŽB je zelo težavna, saj gre pri stresu za subjektivno doživljanje, ki ga ni mogoče enostavno prevesti v merljive in oprijemljive parametre. Preučevanje vloge stresa dodatno zapleta dejstvo, da psihosocialni stresorji velikokrat nastopajo v skupkih (npr. nizka izobrazba, stres, neustrezna prehrana in kajenje) kar otežuje opredelitev pomena posameznega stresorja ali dejavnika tveganja.

Sklepne ugotovitve: Stres na delovnem mestu je pomemben dejavnik tveganja za nastanek SŽB in lahko poveča tveganje za srčno-žilne zaplete celo za 40 %. Zato je pomembno, da morebitne povezave med stresom in SŽB podrobneje preučimo, zlasti zato, ker je na stres na delovnem mestu mogoče vplivati ali ga celo odpraviti.

*Ključne besede:* stres na delovnem mestu, srčno-žilne bolezni, dejavniki tveganja

## **Work related stress as a potential risk factor for cardiovascular diseases**

*Mladen Gasparini*

*Izola General Hospital, Polje 40, 6310 Izola, Slovenia*

**Aim and purpose:** Cardiovascular diseases (CVD) represent a major health burden for the working populations accounting for almost 50% of all deaths and 25% of work disability. CVD prediction models focuses mainly on “conventional cardiovascular risk factors,” such as diabetes, hypertension, dyslipidemia and advanced age, which in themselves account for 60% to 70% of all cases of CVD. Alternative nonconventional risk factors may account for some of this gap and are becoming increasingly important.

**Content:** With most adults spending half of their waking hours at work, the workplace became an important setting where employees could experience stress at work which could have negative effects on CVD. There are only few experimental studies available that studied the link between stress in the workplace and the occurrence of CVD, so data are based mainly on observational studies. Among the important mechanisms that can trigger the onset of CVD due to stress are the disruption of the sympathetic-parasympathetic balance and dysregulation of the hypothalamo-pituitary-adrenal (HPA) axis are well-known circumstances that adversely affect the cardiovascular system both by accelerating the atherosclerotic process and by precipitating the occurrence of a cardiovascular event. In addition to this intrinsic derangements, the work environment can contribute to the adoption of high-risk behaviors such as smoking, physical inactivity, and poor diet thus further increasing the risk of CHD. Defining the role of work stress as a potential risk factor for CVD is demanding, given its subjectivity and the difficulty associated with synthesizing its significant components into comparable metrics. Study of its role is further complicated by the fact that psychosocial stressors have a tendency to coexist and cluster making difficult to elucidate the importance of a single stressor or risk factor.

**Conclusions:** Stress in the workplace is an important risk factor for developing CVD and can increase the risk of cardiovascular complications by as much as 40%. It is therefore important to examine in more detail the possible links between stress and CVD, especially because stress in the workplace can be influenced or even eliminated.

**Key words:** work stress, cardiovascular disease, risk factors

## Povezanost gibalne aktivnosti in indeksa delovne učinkovitosti pri zaposlenih v vrtcu

Anja Andrenšek, Matej Plevnik

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Redna gibalna aktivnost ima dokazano pozitiven učinek na telesno in duševno zdravje, vpliva pa tudi na izboljšano delovno učinkovitost in splošno kakovost življenja. V vrtcu delajo različne skupine zaposlenih, ki jih lahko razvrstimo v tri skupine: (i) strokovni delavci (vzgojiteljice in pomočnice vzgojiteljic), (ii) administracija in vodstvo vrtca ter (iii) zaposleni v podpornih službah (kuharji, čistilke, hišniki). Največkrat preučevana skupina zaposlenih v vrtcu so strokovni delavci. Vzgojitelji v vrtcu opravljajo različne delovne naloge, ki vključujejo poučevanje, nadzor, naloge za vzdrževanje higiene, kot tudi pomoč pri prehranjevanju. Delovna obremenitev je z metaboličnega vidika opisana kot nizko intenzivna aktivnost (Grant idr., 1995). S pogostim zavzemanjem nepravilnih drž in položajev, hitrim delovnim tempom, nezadostno količino počitka in dvigovanjem težkih bremen se poveča tveganje za pojav mišično-skeletnih težav (Punnett in Wegman, 2004). Poleg fizične obremenitve so vzgojitelji izpostavljeni tudi visoki stopnji psihološkega stresa. Vzgojitelji poročajo o preobremenjenosti, časovnem pritisku, visoki odgovornosti, vendar kljub temu menijo, da je njihovo delo zanimivo (Čecho, Švihrová, Čecho, Novák in Hudečková, 2019). Namen naše študije je bil ugotoviti povezanost med stopnjo telesne aktivnosti in indeksom delovne učinkovitosti pri zaposlenih v vrtcu.

Metode: Študija je bila izvedena septembra 2019 v sodelovanju Centra za krepitev zdravja Piran in dveh vrtcev v Občini Piran. V njej je sodelovalo 73 zaposlenih v vrtcu (vzgojiteljice  $n=24$ ; pomočnice vzgojiteljic  $n=27$ ; administracija  $n=5$ ; podporne službe  $n=17$ ). Uporabili smo vprašalnika Global Physical Activity Questionnaire (WHO, n.d.) ter Work Ability Index (European Agency for Safety and Health at Work, n. d.). Analizo rezultatov smo izvedli v programu SPSS Statistics 26.0, z uporabo metod opisne statistike ter analize povezanosti in razlik.

Rezultati: Priporočila o količini dnevne gibalne aktivnosti (WHO, 2010) dosega 95 % vzgojiteljev, 83 % pomočnic vzgojiteljic, 50 % zaposlenih v administraciji ter 94 % zaposlenih v podpornih službah. V primerjavi med skupinami najvišjo gibalno aktivnost pri delu ocenjujejo zaposleni v podpornih službah (Kruskal-Wallis  $H(3)=16,667$ ,  $p=0,001$ ), ta skupina tudi najbolje ocenjuje svojo delazmožnost, in sicer v 54 % kot odlično. Količina gibalne aktivnosti je statistično značilno povezana z indeksom delovne učinkovitosti le v skupini pomočnic vzgojiteljic ( $\chi^2(2)=8,878$ ,  $p=0,012$ ).

Razprava in zaključek: Vrtec kot delovno okolje združuje različne skupine zaposlenih, ki se pri svojem delu soočajo z različnimi vrstami obremenitev. Skladno z dnevnimi obremenitvami mora biti spodbujanje varovanja zdravja na delovnem mestu prilagojeno potrebam posamezne skupine zaposlenih, pri čemer je priporočljivo spodbujanje redne gibalne aktivnosti vseh skupin zaposlenih.

*Ključne besede:* vrtec, gibalna aktivnost, delazmožnost, obremenitev, krepitev zdravja

## Relationship between physical activity and work efficiency among kindergarten employees

Anja Andrenšek, Matej Plevnik

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Regular physical activity has a proven positive effect on physical and mental health and it also has an impact on the improved work efficiency and the overall quality of life. There are different types of employees in a kindergarten: (i) kindergarten teachers/assistants, (ii) administration and management of the kindergarten and (iii) employees in support services (cooks, cleaners, janitors). The most frequently studied group of employees in the kindergarten are teachers/assistants. Kindergarten teachers/assistants perform a variety of work tasks that include teaching, supervision, hygiene maintenance tasks, as well as nutrition assistance. The workload is described from a metabolic point of view as low-intensity activity (Grant et al., 1995). Frequent incorrect postures and positions, fast work pace, insufficient amount of rest and lifting heavy loads increases the risk of musculoskeletal problems (Punnett and Wegman, 2004). In addition to physical exertion, educators are also exposed to high levels of psychological stress. Educators report overwork, time pressure, high responsibility, but nevertheless they find their work interesting (Čečo, Švihrová, Čečo, Novák and Hudečková, 2019). The purpose of our study was to determine the relationship between the level of physical activity and the work efficiency of kindergarten employees.

**Methods:** The study was conducted in September 2019 in cooperation with the Center for Health Promotion Piran and two kindergartens in the Municipality of Piran. It involved 73 kindergarten employees (teachers  $n = 24$ ; assistants  $n = 27$ ; administration  $n = 5$ ; support services  $n = 17$ ). We used the Global Physical Activity Questionnaire (WHO, n.d.) and the Work Ability Index Questionnaire (European Agency for Safety and Health at Work, n.d.). The analysis of the results was performed in the SPSS 26.0, using the methods of descriptive statistics and the analysis of correlations and differences.

**Results:** Recommendations on the amount of daily physical activity (WHO, 2010) are achieved by 95 % of kindergarten teachers, 83 % of assistants, 50 % of employees in administration and 94 % of employees in support services. The comparison between the groups shows the highest physical activity at work is assessed by the employees in support services (Kruskal-Wallis  $H(3) = 16.667$ ,  $p = 0.001$ ), this group also best evaluates their ability to work, namely in 54 % as excellent. The amount of physical activity is statistically significantly related to the work efficiency index only in the group of teacher assistants ( $\chi^2(2) = 8.878$ ,  $p = 0.012$ ).

**Discussion and conclusion:** The kindergarten brings together different groups of employees who face different types of workload in their work. In accordance with the daily workload, the promotion of health protection at the workplace must be adapted to the needs of each group of employees, and it is recommended to encourage regular physical activity of all groups of employees.

**Key words:** kindergarten, physical activity, work ability, workload, health promotion

## Kolikšen delež slovenskih policistov dosega smernice za gibanje in spanje?

Kaja Kastelic<sup>1,3</sup>, Nastja Podrekar<sup>3,2</sup>, Jure Žitnik<sup>3,2</sup>, Nejc Šarabon<sup>2,3</sup>

<sup>1</sup> Univerza na Primorskem, Inštitut Andrej Marušič, Muzejski trg 2, 6000 Koper, Slovenija

<sup>2</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

<sup>3</sup> InnoRenew Coe, Zdravje v grajenem okolju, Livade 6, 6310 Izola, Slovenija

Uvod: Nova 24-urna paradigma na področju gibalne aktivnosti za zdravje postaja široko sprejeta med raziskovalci in (med)narodnimi organizacijami, ki izdajajo smernice za gibalno aktivnost. Omenjena paradigma temelji na dejstvu, da 24-urni dan sestoji iz časa, ki ga preživimo gibalno aktivno, sedentarno in iz časa spanja, ter da iz vidika vpliva na zdravje cel dan šteje. Namen te študije je bil ugotoviti, kolikšen delež slovenskih policistov dosega posamične (izdane/predlagane) smernice in različne kombinacije smernic.

Metode: Študija je potekala znotraj regionalnega projekta PROZ-SIPO. V študiji so sodelovali slovenski policisti ( $n = 461$ ,  $42,6 \pm 7,5$  let, 75 % moških). Preko elektronske pošte smo jih pozvali k izpolnjevanju spletnega Vprašalnika o spanju, sedenju in telesni dejavnosti, s katerim smo ovrednotili njihovo količino udeleževanja v zmerno do visoko intenzivnih gibalnih aktivnostih (ZVGA), količino sedentarnosti in spanja. Rezultate smo predstavili s pomočjo opisne statistike in frekvenčne porazdelitve, s čimer smo ugotavljali prevalenco posamičnega obnašanja in delež preiskovancev, ki dosega posamične smernice ali kombinacijo smernic.

Rezultati: Slovenski policisti se v povprečju ukvarjajo z ZVGA  $320 \pm 323$  minut na teden, preživijo  $9,7 \pm 3,5$  ur na dan sedentarno in spijo  $7,1 \pm 1,2$  ur na dan. Delež preiskovancev, ki dosega smernice za ZVGA ( $>150$  minut na teden; priporočilo Svetovne zdravstvene organizacije), sedentarnost ( $<7$  ur na dan; meja postavljena glede na izsledke Patterson-a idr., 2018) in spanje (7-9 ur na dan; priporočilo Nacionalne fundacije za spanje) je 63 %, 22 % in 53 %. Le 9 % preiskovancev dosega vse tri smernice hkrati, medtem ko jih 16 % ne dosega nobene od smernic. Kombinacijo dveh smernic dosega 36 % in le eno smernico 39 % preiskovancev.

Razprava in zaključek: V preteklih letih so bile izdane 24-urne gibalne smernice za otroke in mladostnike, medtem ko so tovrstne smernice za odrasle in starejše odrasle šele v nastajanju. V tej študiji smo ugotavljali kolikšen delež policistov dosega dobro ustaljene smernice za ZVGA in spanje. Ker kvantitativne smernice za sedentarnost še niso bile izdane, smo privzeli mejo o še dopustni količini sedentarnosti iz literature. Ugotovili smo, da le majhen delež policistov dosega vse tri smernice hkrati, kar kaže na veliko priložnost za promocijo zdrave porabe časa (spanja-sedentarnosti-gibalne aktivnosti).

**Ključne besede:** gibalna aktivnost, sedentarnost, spanje, epidemiologija, priporočila

## Proportion of Slovenian police officers meeting daily activity behaviours guidelines

Kaja Kastelic<sup>1,3</sup>, Nastja Podrekar<sup>3,2</sup>, Jure Žitnik<sup>3,2</sup>, Nejc Šarabon<sup>2,3</sup>

<sup>1</sup> University of Primorska, Andrej Marušič Institute, Muzejski trg 2, 6000 Koper, Slovenia

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

<sup>3</sup> InnoRenew Coe, Human Health in the Built Environment, Livade 6, 6310 Izola, Slovenia

**Introduction:** A recent shift to the 24-hour movement paradigm is being widely accepted by the researchers and (inter)national authorities who develop physical activity guidelines. The new paradigm is based on the fact, that time spent in physical activity, sedentary behaviour and sleep add up to 24-hour day and that for the optimal health all day matters. The aim of this study was to examine the proportion of Slovenian police officers that meet each of the individual (issued/proposed) guidelines or combination of guidelines.

**Methods:** The study was a part of a regional PROZ-SIPO project. Participants were Slovenian police officers ( $n = 461$ ,  $42.6 \pm 7.5$  years, 75 % males). They were recruited via e-mail invitation to fulfil web based Daily activity behaviours questionnaire (DAB-Q) to assess time spent in moderate to vigorous physical activity (MVPA), sedentary behaviour (SB) and sleep. Descriptive statistics and frequency analysis were performed to examine the prevalence of each behaviour and the proportion of participants meeting individual and combination of the guidelines.

**Results:** On average, police officers engaged in  $320 \pm 323$  minutes of MVPA per week. Average time spent in SB was  $9.7 \pm 3.5$  hours and average sleep time was  $7.1 \pm 1.2$  hours per day. The proportion of participants who met MVPA ( $>150$  minutes per week; WHO recommendation), SB ( $<7$  hours per day; a threshold according to Patterson et al., 2018) and sleep (7-9 hours per day; National Sleep Foundation recommendation) guideline were 63 %, 22 % and 53 %, respectively. Only 9 % of participants met all three guidelines, while 16 % did not meet any of the guidelines. A combination of two guidelines was met by 36 % and a single guideline was met by 39 % of participants.

**Discussion and conclusion:** In recent years, the 24-hour movement guidelines have been published for younger age people, while guidelines for adults and older adults are yet underway. In this study, we examined the proportion of police officers that met well established guidelines for MVPA and sleep. Since for SB there is currently no quantitative guideline issued, we set up a threshold based on the best available evidence. We found that only a small proportion of police officers met all three guidelines, revealing a great opportunity for healthy time-use (sleep-sedentary behaviour-physical activity) promotion.

**Key words:** physical activity, sedentary behaviour, sleep, epidemiology, recommendations

## Travmatski izpahi ramena pri starejši aktivni populaciji

*Benjamin Marjanovič, Jakob Merkač, Marko Nabergoj, Samo Novak  
Ortopedska Bolnišnica Valdoltra, Jadranska cesta 31, 6280 Ankaran, Slovenija*

**Ozadje in namen:** Zaradi daljšanja pričakovane življenjske dobe in večanja športne aktivnosti starejše populacije, se število ramenskih izpahov pri tej populaciji veča. Izpahi mladih pacientov se razlikujejo od izpahov starejših. Izključitev pridruženih poškodb je ključna za normalno vrnitev na stanje kot pred poškodbo. Poškodbe rotatorne manšete izgledajo biti ključni problem izpahov pri tej starejši starostni skupini. Namen tega pregleda je ugotoviti kako najhitreje spoznamo pridružene komplikacije in kako pravilno ukrepati.

**Predstavitev vsebine:** Povprečna pričakovana življenjska doba za novorojenčke v Evropi, glede na trenutno umrljivost, je 75 let za moške in 82 let za ženske. Med leti 2010 in 2050 je pričakovati porast populacije starejše od 85 let za 351 %. Starejša ljudje postajajo vse bolj športno aktivni. S tem je povezano vse večje število ramenskih izpahov. Tetive in mišice igrajo ključno vlogo pri zagotavljanju stabilnosti ramenskega sklepa. S staranjem se natezna čvrstost tetiv in mišic manjša. To pripelje do bistveno različnih pridruženih poškodb, pri ramenskih izpaih starostnikov v primerjavi z mladino. Manjša frekvenca ponavljajočih izpahov, več pridruženih poškodb rotatorne manšete, kostnih zlomov, poškodb živcev, so le nekatere značilnosti, ki razlikujejo staro od mlade populacije. Pri repoziciji izpaha ramena mora priti v kratkem do zmanjšanja bolečine. Če bolečina vztraja več kot dva tedna po repoziciji, je potrebno posumiti na pridruženo poškodbo rotatorne manšete. Poškodbo izključimo s pomočjo slikanja CT artrografije ali magnetne resonance. Imobilizacija pri starejših pripelje hitreje do zakrčenosti sklepa kot pri mladih.

**Sklepne ugotovitve:** Ramenska nestabilnost ima ključne razlike glede na starost pacienta. Nujna je izključitev pridruženih poškodb. Vedno pričnemo z konzervativnim zdravljenjem. V primeru vztrajanja bolečin je prvo potrebno izključiti poškodbo rotatorne manšete. Pre dolga imobilizacija lahko pripelje do rigidnosti sklepa.

**Ključne besede:** ramenska nestabilnost, poškodbe rotatorne manšete, diagnostični protokol, ukrepanje



## Shoulder traumatic luxation in elderly active population

*Benjamin Marjanovič, Jakob Merkac, Marko Nabergoj, Samo Novak  
Orthopedic Hospital Valdoltra, Jadranska cesta 31, 6280 Ankaran, Slovenia*

**Background and purpose:** Because of prolonged life expectancy the prevalence of traumatic anterior shoulder dislocations in the elderly population has increased. Shoulder dislocations in the elderly are known to differ from those of the younger. The accurate diagnosis of associated injuries is crucial to restore normal shoulder function. Rotator cuff tears have been shown to be the predominant pathological lesion in the majority of elderly patients. The purpose of this review is to know how we can early detect those injuries and appropriate application of treatment modalities.

**Presentation of the content:** Average life expectancy in Europe of a newborn according to the current mortality rate is 75 for males and 82 for females. The 85-and-over population is projected to increase 351 % between 2010 and 2050. The prevalence of traumatic anterior dislocation of the shoulder in the elderly has increased over the years due to increased participation in sports, extended life expectancy and lifestyle changes. Tendons and muscles play a crucial role in shoulder stability. We know that with increasing of age the cuff loss its tensile strength and number of rotator cuff tears increase too. Low recurrence rate is another big difference from young patients. With increasing of the age, we have more nerve injuries and bone fractures as complication to shoulder instability. Reduction of a dislocated shoulder should be accompanied with a rapid decrease in pain. If the pain persists after 2 weeks, a rotator cuff tear should be strongly suspected. In general, after 2 weeks of immobilization control the patient and if pain persist, send him to shoulder CT arthrography or MRI to have a better assessment of associated lesions. Shoulder immobilization after reduction should be as short as possible due to decrease shoulder stiffness.

**Conclusion:** Shoulder instability in elderly defer from instability in young. Check for associated complications. Start always conservatively. In case of pain, exclude rotator cuff lesion. When immobilize think about overstuffing.

**Key words:** shoulder instability, rotator cuff tears, diagnosis, treatment options

## Ali lahko zmanjšamo tveganje za popoškodbeno obrabo kolena?

*Marko Nabergoj, Samo Novak, Jakob Merkač, Benjamin Marjanovič  
Ortopedska Bolnišnica Valdoltra, Jadranska cesta 31, 6280 Ankaran, Slovenija*

Ozadje in namen: Glavni dejavniki tveganja za obrabo (OB) kolena so starost, poškodbe in debelost. Zaenkrat nimamo zadovoljivih dokazov, da bi bila prej omenjena tveganja spremenljiva do te mere, da bi lahko učinkovito zmanjšali razvoj OB kolena in njegove simptomatike. Bistvena izjema je naraščajoča epidemija (športnih) poškodb OB kolena. Namen tega pregleda je predstaviti tveganja za popoškodbeno OB kolenskega sklepa in predstaviti načine kako jih lahko preprečimo.

Predstavitev vsebine: Poškodbe meniskusa in sprednjega križnega ligamenta (SKL) so pogoste pri športnikih in splošni populaciji. Ocenjujejo, da je kumulativno populacijsko tveganje za poškodbo SKL med 10. in 64. letom približno 5 % na podlagi ugotovitev MRI akutno poškodovanega kolena, pri poškodbah meniskusa, ki vodijo k operaciji, pa vsaj 15 %. Tveganje za razvoj popoškodbene OB kolenskega sklepa zaradi poškodbe kolena je visoko; približno 50 % posameznikov z SKL ali meniskusom razvije OB kolena. Dejavniki tveganja za poškodbo kolena vključujejo notranje (anatomske, živčno-mišične, hormonske) in zunanje dejavnike (okolje, uporaba kolenske opornice, tip podplata pri športni obutvi glede na podlago in vreme). Metaanaliza, ki vključuje podatke 27.000 posameznikov, je pokazala, da so živčno-mišični in proprioceptivni vadbeni programi uspešni pri preprečevanju približno 50 % poškodb SKL. Randomizirana študija pri bolnikih s patelofemoralno OB je pokazala, da nošenje kolenske opornice zmanjša bolečino in obseg lezij kostnega mozga v prizadetem predelu. Metaanaliza je pokazala, da so poškodbe spodnjih okončin približno 2,5-krat večje, če so med podlago in podplatom športne obutve prisotne višje stopnje rotacijskega vleka. Rotacijski vlek lahko spreminjamo s športnikovim izborom obutve za dano površino in glede na vremenske razmere.

Sklepne ugotovitve: Popoškodbena OB kolena je pogosta bolezen, katere incidenca bo predvidoma še narastla zaradi večjega športnega udejstvovanja populacije. Zato je uporaba preventivnih strategij bistvenega pomena za preprečevanje epidemije popoškodbene OB kolena.

*Ključne besede:* poškodba kolena, meniskus, sprednji križni ligament, preventiva, obraba

## Can we lower the risk of injury-related knee osteoarthritis?

*Marko Nabergoj, Samo Novak, Jakob Merkač, Benjamin Marjanovič  
Orthopedic Hospital Valdoltra, Jadranska cesta 31, 6280 Ankaran, Slovenia*

**Background and purpose:** The main risk factors for knee osteoarthritis (OA) are advanced age, obesity and injury. Nonetheless, there is limited or no evidence that they are changeable or to what degree changing them is effective in preventing development of knee OA or in preventing symptoms and progressive disease in persons with early OA. The notable exception is the growing epidemic of (sports) injury related knee OA. The purpose of this review is to present the risk of knee osteoarthritis from knee joint injuries and present ways of how we can prevent them.

**Presentation of the content:** Meniscus and anterior cruciate ligament (ACL) injuries are common in athletes and the general population. It is estimated that the cumulative population risk of an anterior cruciate ligament (ACL) injury between 10 and 64 years of age is about 5 % based on MRI findings of the acutely injured knee, and for meniscus injury leading to surgery is at least 15 %. The risk of knee OA from knee joint injury is high; approximately 50 % of individuals with an ACL or meniscus tear develop knee OA. Risk factors for knee injury include intrinsic (anatomic, neuromuscular, hormonal) and extrinsic factors (environmental, including knee bracing, shoe-surface interface, weather). A meta-analysis including data derived from 27,000 individuals found that neuromuscular and proprioceptive training programs are successful in preventing around 50 % of ACL injuries. In a randomized study in patients with patellofemoral OA, bracing was associated with pain relief and a decreased volume of bone marrow lesions in the affected compartment. Another meta-analysis has shown that the odds of lower limb injury are approximately 2.5 times higher when higher levels of rotational traction are present at the athletes shoe-surface interface. Rotational traction can be modified by the athlete's footwear selection for a given surface and weather conditions.

**Conclusion:** Injury related knee OA is a common disease, which is predicted to become more prevalent as rates of physical inactivity increase. The employment of prevention strategies is therefore essential to prevent an epidemic of injury related knee OA.

**Key words:** knee injury, meniscus, anterior cruciate ligament, prevention, arthritis

## Odnos med nekaterimi vidiki duševnega zdravja, izgorelostjo in športno rekreacijo pri zaposlenih v zdravstveni negi

Marko Petrovič<sup>1</sup>, Petra Dolenc<sup>2</sup>

<sup>1</sup> Zdravstveni dom Izola, Ul. Oktobrske revolucije 11, 6310 Izola, Slovenija

<sup>2</sup> Univerza na Primorskem, Pedagoška fakulteta, Cankarjeva ulica 5, 6000 Koper, Slovenija

**Uvod:** Povečana specializacija in širjenje poklicnega področja zdravstvene nege sta prispevala k povečanju obsega dela zaposlenih v zdravstveni negi, s čimer so se povečale tudi njihove delovne obremenitve in odgovornosti. Vse navedeno se lahko odraža v višji stopnji stresa in pojavu izgorelosti. Med učinkovite strategije ohranjanja duševnega zdravja prištevamo tudi redno telesno aktivnost. Namen raziskave je bil zato ugotoviti odnos med nekaterimi vidiki duševnega zdravja, izgorelostjo in količino športne rekreacije pri zaposlenih v zdravstveni negi.

**Metode:** V raziskavo smo vključili 305 zdravstvenih delavcev, ki so izpolnili vprašalnike, s katerim smo preverjali simptome stresa, anksioznosti, depresivnosti in izgorelosti, stopnjo zadovoljstva z življenjem ter količino športne rekreacije.

**Rezultati:** Rezultati kažejo, da približno dve tretjini udeležencev ne dosega priporočil glede zmerno-intenzivne kot tudi ne visoko-intenzivne vadbe. Nadalje ugotavljamo, da izražajo nekoliko nadpovprečno raven poklicnega stresa in čustvene izčrpanosti, ne pa tudi ostalih vidikov izgorelosti (depersonalizacije, osebne izpolnitve) ali težav v duševnem zdravju. Prav tako so s svojim življenjem razmeroma zadovoljni. Udeleženci z višjo stopnjo zmerno-intenzivne telesne aktivnosti navajajo manj simptomov depresivnosti ( $p < 0,01$ ), anksioznosti ( $p < 0,001$ ) in stresa ( $p < 0,01$ ) v primerjavi s tistimi z nižjo stopnjo zmerno-intenzivne telesne aktivnosti, medtem ko v dimenzijah izgorelosti in zadovoljstva z življenjem nismo ugotovili razlik. Prav tako nismo opazili razlik v preučevanih psiholoških spremenljivkah glede na količino visoko-intenzivne telesne aktivnosti. S korelacijsko metodo smo potrdili pozitivne srednje visoke povezanosti med posameznimi vidiki duševnega zdravja in izgorelosti ( $p < 0,01$ ). Preučevane spremenljivke duševnega zdravja in izgorelosti so negativno korelirale s splošnim zadovoljstvom z življenjem ( $p < 0,01$ ).

**Razprava in zaključek:** Rezultati raziskave v veliki meri odsevajo problematiko nezadostne telesne aktivnosti v splošni odrasli populaciji. Višja stopnja zmerno-intenzivne telesne aktivnosti se povezuje z boljšim duševnim zdravjem zaposlenih v zdravstveni negi. Izsledki spodbujajo razmislek o možnosti vključevanja preventivnih programov za učinkovitejše spoprijemanje z delovnim stresom zaposlenih, predvsem v smislu zagotavljanja primerne telesne vadbe.

**Ključne besede:** športna rekreacija, duševno zdravje, zdravstvena nega, izgorelost, blagostanje

## Relationship between some aspects of mental health, burnout and sports recreation among health care workers

Marko Petrovič<sup>1</sup>, Petra Dolenc<sup>2</sup>

<sup>1</sup> Health center Izola, Ulica Oktobrske revolucije 11, 6310 Izola, Slovenia

<sup>2</sup> University of Primorska, Faculty of Education, Cankarjeva ulica 5, 6000 Koper, Slovenia

**Introduction:** Increased specialization and expansion of the nursing profession have contributed to an increase in the workload of nursing staff as well as to their workload and responsibilities. All the above can be reflected in a higher level of stress and the onset of burnout. Effective strategies for mental health promotion also include regular physical activity. The purpose of the study was to determine the relationship between certain aspects of mental health, burnout, and the amount of sports recreation among health care employees.

**Methods:** The study included 305 health care workers who filled out questionnaires to examine the psychological variables studied (stress, anxiety, depression, burnout, satisfaction with life) and the amount of sports recreation.

**Results:** The results of the amount of sports recreation show that about two thirds of the participants do not meet the recommendations for moderate and high intensity physical activity. Furthermore, participants expressed slightly above-average level of work stress and emotional exhaustion, which is not the case with other aspects of burnout (depersonalization, personal accomplishment) and mental health problems. They were also relatively satisfied with their lives. Participants with higher levels of moderate physical activity exhibited less symptoms of depression ( $p < 0.01$ ), anxiety ( $p < 0.001$ ), and stress ( $p < 0.01$ ) compared with those with lower levels of moderate physical activity, while no differences were found in the dimensions of burnout and life satisfaction. There were also no differences in psychological variables studied in relation to the amount of high intensity physical activity. Positive associations between components of mental health and burnout have been identified ( $p < 0.01$ ). All mental health and burnout variables correlated negatively with life satisfaction ( $p < 0.01$ ).

**Discussion and conclusion:** The study largely reflect the problem of insufficient physical activity in the general adult population. However, it can be assumed that higher levels of moderate physical activity are associated with better mental health of health care workers. Based on the findings, possible prevention activities to cope with work stress should be considered, especially in terms of providing adequate levels of physical activity.

**Key words:** sports recreation, mental health, health care, burnout, wellbeing

## Medgeneracijski planinski projekt »Z roko v roki gor na vrh« v vrtcu

Tanja Plevnik Peternelj

Izhodišča in namen: Predšolski otroci so pogosto tudi pobudniki in motivatorji za dejavnosti celotne družine. V prispevku želimo predstaviti zasnovo projekta z naslovom »Z roko v roki gor na vrh«, ki ga nameravamo izpeljati v prihodnjem šolskem letu s skupino predšolskih, 5 do 6 let starih otrok ter njihovimi starši. Spodbuditi želimo dejavnosti celotne družine, širitev in krepitev socialnih mrež družin ter predstaviti možnosti raznolikih dejavnosti gibalnega značaja otrok ter njihovih staršev v lokalnem okolju. Medgeneracijske dejavnosti so namenjene tudi spodbudi staršev kot delovne aktivne populacije za vzpostavitev in/ali ohranjanje gibalno aktivnega in zdravega življenjskega sloga. Opažamo, da so pogosto starši predšolskih otrok tisti, ki jim moramo strokovni delavci v vrtcu nameniti posebno pozornost, če želimo spodbuditi dejavnosti otrok v naravi tudi v prostem času.

Predstavitev vsebine: Zasnovali smo obogatitveno dejavnost z naslovom »Z roko v roki gor na vrh«. Namen dejavnosti je spodbujanje aktivnega življenjskega sloga celotne družine predšolskega otroka. V šolskem letu bo organizirano sedem izletov na vrtcu bližnje okoliške pohodne točke. Otroci, ki se bodo skupaj s starši udeležili vsaj enega izleta bodo dobili priznanje za spodbudo »Korak v pravo smer«. Otroci, ki se bodo skupaj s starši udeležili vsaj treh izletov bodo dobili priznanje »Spodbudno proti cilju« in vsaj petih izletov skupaj s starši priznanje »Aktivna družina – skupaj smo dosegli vrh«.

Sklepne ugotovitve: Z organizacijo obogatitvenih dejavnosti v vrtcu želimo spodbuditi otroke in njihove starše k dejavnemu življenjskemu slogu, ozaveščanju staršev in otrok o pomembnosti in raznolikosti gibanja na prostem, kvalitetnega preživljanja prostega časa z igro, sproščanjem in medsebojnim druženjem, spoznavanju flore in favne ter pri tem širiti obzorja poznavanja lokalnega okolja. Starši predšolskih otrok kot predstavniki delovno aktivne populacije prebivalcev so postavljeni pred izziv dnevnega usklajevanja delovnih obremenitev in družinskih obveznosti. Obogatitvene dejavnosti, ki se izvajajo v organizaciji vrtčevskega okolja pogosto predstavljajo tudi priložnost za kvalitetno preživljanje njihovega prostega časa.

*Ključne besede:* hoja, planine, vzgoja, družina, vrtec

## Intergenerational mountaineering project “Hand in hand up to the top” in preschool

*Tanja Plevnik Peternelj*

**Introduction and purpose:** Preschool children are often also the initiators and motivators for the activities of the whole family. In this paper, we want to present the design of the project titled “Hand in hand up to the top”, which we intend to carry out in the coming school year with a group of 5- and 6-year-old preschool children and their parents. We want to encourage the activities of the whole family, expand and strengthen the social networks of families and present the possibilities of various physical activities of children and their parents in the local environment. Intergenerational activities are also intended to encourage parents as an active working population to establish and/or maintain a physically active and healthy lifestyle. We notice that often the parents of preschool children are the ones to whom the professionals in the kindergarten need to pay special attention in order to encourage children’s activities in nature also in their free time.

**Content presentation:** We designed an enrichment activity titled “Hand in hand up to the top”. The purpose of the activity is to promote an active lifestyle of the whole family of a preschool child. During the school year, seven excursions will be organized at the kindergarten to the nearby hiking points. Children who take part in at least one trip together with their parents will receive recognition for the “Step in the right direction” encouragement. Children who take part in at least three trips together with their parents will receive the “Encouraging towards the goal” award, and those with at least five trips together with their parents will receive the “Active family – we have reached the top together” award.

**Conclusions:** By organizing enrichment activities in the kindergarten, we want to encourage children and their parents to an active lifestyle, raising awareness of parents and children about the importance and diversity of outdoor activities, quality leisure time with play, relaxation and socializing, learning about flora and fauna and broadening horizons and the knowledge of the local environment. Parents of preschool children, as representatives of the working population, are faced with the challenge of daily juggling their workloads and family obligations. Enrichment activities carried out in the organization of the kindergarten environment often represent an opportunity for quality spending of their free time.

**Key words:** walking, mountains, education, family, preschool

## Vpliv 8-tedenske intervencije na gibalne, telesne in psihične dejavnike žensk s prekomerno maso

Ana Šuštaršič, Mateja Videmšek, Maja Dolenc, Damir Karpljuk, Vedran Hadžić  
Univerza v Ljubljani, Fakulteta za šport, Gortanova 22, 1000 Ljubljana, Slovenija

**Uvod:** Namen raziskave je bil ugotoviti, kako vpliva 8-tedenska vadbeno-terapevtska intervencija s spremembo življenjskega sloga na gibalne sposobnosti (gibljivost, vzdržljivost v moči in vzdržljivost), telesne značilnosti ter psihično počutje (samopodoba, stres, depresija itd.) žensk s prekomerno telesno maso.

**Metode dela:** V raziskavo je bilo vključenih 13 preiskovank starih  $31,85 \pm 4,3$  let, z indeksom telesne mase večjim od  $30 \text{ kg/m}^2$  (povprečna telesna masa je bila  $110,2 \text{ kg}$ ). Program, v katerega so bile vključene preiskovanke, je potekal 8 tednov. V program je bilo zajetih 16 vadbenih enot, ki so potekale dvakrat tedensko na Fakulteti za šport pod vodstvom diplomantke Fakultete za šport, dvakrat tedensko pa so morale preiskovanke samostojno izvajati aerobno aktivnost dolgo vsaj 30 min, kar pomeni, da so bile vsaj štirikrat tedensko telesno dejavne. Na začetku in koncu programa so opravile meritve, ki so zajemale preizkus gibalnih sposobnosti, telesnih značilnosti in psiholoških dejavnikov. Preizkus gibalnih sposobnosti je bil sestavljen iz 9 testov, in sicer smo uporabili 2 testa za preverjanje gibljivosti (predklon sede, FMS rame – gibljivost ramenskega obroča), 6 testov za vzdržljivost v moči (skleca, potegi proti drogu, upogibi trupa, dvig nog iz leže na trebuhu, počep, drža v opori na podlahteh) in en test za preverjanje aerobne vzdržljivosti (YMCA 3-min test stopanja). Merjenje telesnih značilnosti (telesna masa in maščoba ter mišična masa) smo izvedli z bioimpedanco. Izmerili smo tudi obsege trebuha, pasu in bokov. Psihološke dejavnike smo preverjali z anketnim vprašalnikom, ki se je navezoval na življenjski slog, zdravje, stres, zadovoljstvo in samopodobo. Pri statistični analizi dobljenih podatkov smo uporabili t-test za odvisne vzorce, dvosmerni hi-kvadrat test in Wilcoxonov test predznačnih rangov. Vse analize smo izvedli pri stopnji značilnosti  $p \leq 0,05$ .

**Rezultati:** Razlike med začetnimi in končnimi meritvami telesnih značilnosti so bile statistično značilne; telesna masa se je povprečno znižala za  $6,28 \text{ kg}$ , telesna maščoba za  $2,55 \%$ , ITM za  $2,17 \text{ kg/m}^2$ , obseg trebuha za  $6,31 \text{ cm}$ , obseg pasu za  $9,02 \text{ cm}$  in obseg bokov za  $6,31 \text{ cm}$ . Statistično značilno so se izboljšali rezultati vseh gibalnih testov (povprečna izboljšanja: predklon sede –  $6,5 \text{ cm}$ , FMS rame –  $3,7 \text{ cm}$ , skleca –  $12,1$  ponovitev, potegi k drogu –  $2,3$  ponovitev, upogib trupa –  $15,3$  ponovitev, dvig nog iz leže na trebuhu –  $53,2 \text{ s}$ , počep –  $19,2$  ponovitev, drža v opori na podlahteh –  $37,2 \text{ s}$  in YMCA 3-min test stopanja –  $11,6$  udarcev srca na minuto). Izboljšalo se je tudi psihično počutje žensk (zadovoljstvo, stres, pozitivna samopodoba, kvaliteta spanja ...).

**Razprava in zaključek:** Omejitev raziskave je velikost vzorca in odsotnost kontrolne skupine, vendar smo ugotovili, da ima telesna vadba pozitiven vpliv na izgubo telesne mase, izboljšanje gibalnih sposobnosti, telesnih značilnosti in psihološkega počutja žensk s prekomerno telesno maso.

**Ključne besede:** debelost, vadba, hujšanje, psihično počutje



## The impact of 8-week intervention on motor, physical and psychological factors for overweight women

Ana Šuštaršič, Mateja Videmšek, Maja Dolenc, Damir Karpljuk, Vedran Hadžić  
University of Ljubljana, Faculty of Sport, Gortanova 22, 1000 Ljubljana, Slovenia

**Introduction:** The purpose of the study was to determine how 8-week intervention programme and a healthy lifestyle change affects overweight women, how it affects their motor capabilities (flexibility, strength endurance and endurance), physical characteristics and psychological condition (self-image, stress, satisfaction).

**Methods:** The sample consisted of 13 test subjects with excessive body weight (average body weight was 110.2 kg), with IBM higher than 30 kg/m<sup>2</sup>, aged 31,85 ± 4.3 years. The program lasted 8 weeks, included 16 exercise units and had been held twice a week at the Faculty of Sport under the guidance of a graduate from the Faculty of Sport. The subjects had to individually perform aerobic activity for at least 30 minutes, which means they were physical active at least four times per week. They performed measurements of motor capabilities, physical characteristics and psychological factors at the very beginning and the very end of the program. The motor capability assessment consisted of 9 tests, which were used to measure flexibility (2 tests: sit and reach test, shoulder flexibility), strength endurance (6 tests: push-ups, pull-ups, sit-ups, the strength of hip and back extensors, squats, plank test) and endurance (1 test: YMCA 3-min stepping test). We measured the body characteristics using a bioelectrical impedance analysis. In addition to the abovementioned parameters we measured abdominal, waistline and hip circumferences as well. The psychological factors were measured by questionnaire which was related to a lifestyle, health, stress, satisfaction and self-image. We compared the differences between the initial and final states with the T-test for dependent samples, or in the case of a normal distribution violation, with a nonparametric test (Wilcoxon). All the analyses were carried out at the characteristic level  $p \leq 0.05$ .

**Results:** The differences between initial and final measurements of body characteristics have been statistically significant; on average, the subjects' body weight decreased by 6.28, body fat by 2.55 %, BMI by 2.17 units, abdominal circumference by 6.3 cm, waistline circumference by 9.0 cm, and hip circumference by 6.3 cm. All motor capabilities statistically significant improved (average improvements: sit and reach test – 6.5 cm, shoulder flexibility – 3.7 cm, push-ups – 12.1 repetitions, pull-ups – 2.3 repetitions, sit-ups – 15.3 repetitions, the strength of hip and back extensors – 53.2 s, squats – 19.2 repetitions, plank test – 37.2 repetitions and YMCA 3-min stepping test – 11.6 heart rate per minute). The psychological well-being of test subjects has also improved (positive self-image, quality of sleep...).

**Discussion and conclusion:** A limitation of the study is the sample size and the absence of a control group but anyway we found that a regular physical activity has had positive effects on weight loss, motor capabilities, physical characteristics and psychological conditions consequently a better quality of life.

**Key words:** obesity, regular exercise, weight loss, psychological condition

## Povezanost telesne aktivnosti v srednjem obdobju življenja s tveganjem za demenco

Monika Zadnikar<sup>2</sup>, Danielle Jagodic<sup>1</sup>

<sup>1</sup> Dom starejših Škofljica, Ob potoku 11, 1291 Škofljica, Slovenija

<sup>2</sup> Fakulteta za zdravstvo Angele Boškin, Spodnji Plavž 3, 4270 Jesenice, Slovenija

**Uvod:** Demenca je skupek simptomov oziroma oviranosti pri katerem gre za motnjo več višjih kortikalnih, kognitivnih in intelektualnih funkcij. Je progresivno, ireverzibilno in terminalno stanje, ki poleg posameznika prizadene njegovo družino in posredno celotno družbo. Razvoj demence je povezan z življenjskim slogom v srednjem obdobju življenja. Telesna aktivnost velja kot pomemben varovalni dejavnik življenjskega sloga za zdravje. Namen raziskave je bil ugotoviti povezanost telesne aktivnosti v srednjem obdobju življenja s tveganjem za demenco in incidenco demence ter kognitivnim zdravjem v starosti.

**Metoda:** Izveden je bil sistematični pregled literature. S ključnimi besedami: »physical activity«, »exercise«, »cardiovascular fitness«, »midlife«, »midle age«, »dementia risk«, »dementia incidence«, »cognitive impairment« in »cognitive decline«, smo iskali v bibliografskih bazah: PubMed Central, Google Učencjak, ProQuest in Wiley. Iskanje je potekalo v časovnem obdobju od leta 2015 do 2020.

**Rezultati:** Od 39 člankov jih je po vključitvenih kriterijih: dostopnost, znanstvenost, vsebinska ustreznost, polno besedilo, IMRAD struktura in aktualnost v končno analizo vključenih 15. Od tega je 12 longitudinalnih in prospektivnih kohortnih raziskav, 2 metaanalizi in 1 sistematični pregled literature. Raziskava ima omejitve v različnih metodah in časovnih intervalih zbiranja podatkov v vključenih študijah, kar ne zagotavlja primerljivih raziskovalnih rezultatov. **Razprava in zaključek:** Raziskava je pokazala, da si avtorji niso enotni o povezanosti telesne aktivnosti v srednjem življenjskem obdobju s tveganjem za nastanek demence in kognitivnim zdravjem v kasnejšem obdobju življenja. Prav tako imajo deljena mnenja o povezanosti telesne aktivnosti v srednjih letih z incidenco različnih vrst demence. Za oblikovanje priporočil glede telesne aktivnosti v srednjem življenjskem obdobju za ohranjanje kognitivnih zmogljivosti in preprečevanje demence so potrebne nadaljnje raziskave, ki bodo z uporabo standardnih metod ugotovljale vpliv telesne aktivnosti na varovanje pred demenco.

**Ključne besede:** telesna aktivnost, srednje življenjsko obdobje, kognitivno zdravje, demenca

## Relation between middle age physical activity and risk of dementia

Monika Zadnikar<sup>2</sup>, Danielle Jagodic<sup>1</sup>

<sup>1</sup> Dom starejših Škofljica, Ob potoku 11, 1291 Škofljica, Slovenia

<sup>2</sup> Angela Boškin Faculty of Health Care, Spodnji Plavž 3, 4270 Jesenice, Slovenia

**Introduction:** Dementia is a set of symptoms or disabilities that is a disorder of several higher cortical, cognitive and intellectual functions. It is a progressive, irreversible and terminal condition that affects not only the individual but also his family and indirectly the whole society. The development of dementia is associated with a lifestyle in middle age. Physical activity is considered an important protective factor of lifestyle for health. The aim of the study was to determine the association of physical activity in middle age with the risk of dementia and the incidence of dementia and cognitive health in old age.

**Method:** Performed was a systematic review. With the *Key words*: „physical activity“, „exercise“, „cardiovascular fitness“, midlife „,“ midle age „,“ dementia risk „,“ dementia incidence „,“ cognitive impairment „and“ cognitive decline „, we searched in bibliographic PubMed Central, Google Scholar, ProQuest and Wiley. The search took place in the period from 2015 to 2020.

**Results:** Out of 39 articles, 15 were included in the final analysis according to the inclusion criteria: accessibility, scientificity, content relevance, full text, IMRAD structure and topicality. cohort research, 2 meta-analyzes and 1 systematic review of the literature. The research has limitations in the different methods and time intervals of data collection in the included studies, which does not provide comparable research results.

**Discussion and conclusion:** The research showed that the authors do not agree on the association of physical activity in middle life with the risk of developing dementia and cognitive health in later life. They also have divided opinions about the association of middle-aged physical activity with the incidence of different types of dementia. Further research is needed to make recommendations regarding physical activity in middle life to maintain cognitive performance and prevent dementia, using standard methods to determine the impact of physical activity on protection against dementia.

*Key words:* physical activity, middle life, cognitive decline, dementia



**Sekcija/Section**  
**Ohranjanje in krepitev zdravja delovno**  
**aktivne populacije**  
**Maintaining and promoting health**  
**of the working-age population**

---

## Vabljeno predavanje Invited lecture

### Evropski kodeks proti raku naj ne obvisi v zraku: manj raka v delovno aktivni populaciji

*Urška Ivanuš*

*Onkološki inštitut Ljubljana, Zaloška 2, 1000 Ljubljana, Slovenija  
Zveza slovenskih društev za boj proti raku, Trubarjeva 76 a, 1000 Ljubljana,  
Slovenija*

Izhodišča: Rak je vodilni vzrok prezgodnje smrti v Sloveniji, odgovoren je za okrog 44 % vseh smrti pred 65. letom starosti, v delovno aktivnem obdobju življenja. Ker z ukrepi primarne in sekundarne preventive lahko pomembno zmanjšamo breme raka, je Mednarodna agencija za raziskovanje raka pri SZO izdala Evropski kodeks proti raku z 12 nasveti, z upoštevanjem katerih si lahko posameznik pomembno zmanjša verjetnost, da bo zbolel ali umrl zaradi raka. Več kot polovico raka lahko pripišemo staranju, 70–90 % preostalih rakov pa dejavnikom življenjskega okolja.

Vsebina: Najbolj pomembni preprečljivi raki pri delovno aktivnem prebivalstvu so raki, povezani s tobakom. Kadilci izgubijo 10 do 15 let življenja. V Sloveniji kadi četrтина odraslih prebivalcev, dve tretjini jih želi kajenje opustiti, zaradi posledic rabe tobaka pa letno umre več kot 3.000 ljudi. Kajenje povzroča rake na 16 različnih lokacijah. Pljučni rak je odgovoren za 20 % vseh smrti zaradi raka in je vodilni vzrok smrti zaradi rakov pri obeh spolih. Okrog 13 % vseh rakov je posledica okužb, v razvitih predelih sveta manj. Ti raki se pojavljajo pri mlajših, delovno aktivnih. Okrog 90 % teh rakov povzročajo *Helicobacter pylori* (okoli 75 % želodčnega raka), človeški papilomavirusi (HPV, skoraj vsi primeri raka materničnega vratu in nekateri drugi raki) ter virusi hepatitisa B in C (okrog 50–80 % jetrnoceličnega raka). V Sloveniji imamo vse tri priporočene organizirane presejalne programe, ZORA, DORA in SVIT. Posebno mesto med raki zavzema rak materničnega vratu, ki se najpogosteje pojavlja v starosti, ko so ženske delovno aktivne. V Sloveniji ta rak zaradi učinkovitega presejalnega programa ZORA ni več pogost. SZO je leta 2018 napovedala eliminacijo tega raka kot javnozdravstvenega problema s kombinacijo cepljenja proti HPV ter organiziranih presejalnih programov.

Ugotovitve: Z upoštevanjem 12 enostavnih priporočil Evropskega kodeksa proti raku lahko preprečimo okrog 50 % vseh rakov. Delovno aktivno prebivalstvo je smiselno opolnomočiti za opuščanje kajenja, izogibanje tobačnemu dimu iz okolja, udeležbo v presejalnih programih ZORA, DORA in SVIT, odločitev za cepljenje svojih otrok proti okužbam s HPV in virusom hepatitisa B ter upoštevanje drugih priporočil, vključno z zdravim življenjskim slogom.

*Ključne besede:* rak, preventiva, delovno aktivno prebivalstvo, Evropski kodeks proti raku

## **The European Code Against Cancer exploitation: less cancer in working age population**

*Urška Ivanuš*

*Institute of Oncology, Zaloška 2, 1000 Ljubljana, Slovenia*

*The association of Slovenian cancer societies, Trubarjeva 76 a, 1000 Ljubljana, Slovenia*

Introduction: Cancer is the leading cause of premature death in Slovenia, contributing to 44% of all deaths before the age of 65. Due to a highly effective primary and secondary prevention the International Agency for Research on Cancer at WHO launched European Code Against Cancer, with an advice how to prevent cancers at individual level. More than half of new cancers develop due to aging, however 70-90% of the remaining cancers develop due to risk factors that can be controlled by individuals themselves.

Cancer risk factors: Most important preventable cancers in working age are tobacco-attributed cancers. Smokers lose on average 10-15 life-years. In Slovenia, about a quarter of adult population smokes, two thirds want to quit and more than 3,000 people die each year due to tobacco use. Tobacco use is associated with 16 cancers. In Slovenia, lung cancer contributes to 20% of all cancer deaths and is the leading cause of cancer related deaths in men and women. Around 13% of all cancers are caused by infections, less in developed regions. These cancers typically develop in working age, 90 % are caused by *Helicobacter pylori* (around 75% of gastric cancer), human papillomaviruses (HPV, almost all cervical cancers and partially some other cancers) and hepatitis B and C viruses (around 50–80% of hepatocellular cancer). Cervical cancer has a special position among cancers. The WHO launched a global call in 2018 for the elimination of cervical cancer as a public health problem through a combination of HPV vaccination and population-based organised screening. In Slovenia, all three recommended population-based organised cancer screening programmes are implemented and cervical cancer is not common any more due to a success of the screening programme ZORA.

Cancer prevention conclusions: By following 12 simple recommendation of the European Code Against Cancer around 50% of all cancers can be prevented. It is important to empower individuals in the working age to quit smoking, avoid second-hand smoke, participate in the organised screening programs, support the vaccination of children against HPV in hepatitis B virus and also, to follow other recommendations, including healthy lifestyle.

Key words: cancer, prevention, working age population, European Code Against Cancer

## Z gibanjem se sprostim in lažje učim

Vesna Boštjančič

Osnovna šola Dragotina Ketteja Ilirska Bistrica, Župančičeva ulica 7,  
6250 Ilirska Bistrica, Slovenija

Izhodišča in namen: Danes že praktično vsi vemo, da gibanje pomeni zdravje. Kljub visoki ozaveščenosti o pomembnosti gibalne aktivnosti, je v praksi delež redno gibalno aktivnih Slovencev znatno manjši. Zadostna gibalna dejavnost je varovalni dejavnik zdravja, saj vpliva tako na telesno kot tudi duševno zdravje. Gibalna neaktivnost zmanjšuje splošno odpornost, vpliva na nastanek dejavnikov tveganja za zdravje in na razvoj številnih kroničnih nenalezljivih bolezni ter posledično slabša kvaliteto življenja posameznika. Poleg gibalne neaktivnosti postaja stres v delovnem okolju druga najpomembnejša težava na področju zdravja.

Predstavitev vsebine: Številne raziskave dokazujejo, da je opravljanje učiteljskega poklica stresna dejavnost ter da v učiteljskem poklicu izgorelost postaja vse večji problem. Zelo pomembno je učenje obvladovanja stresa, pri čemer so bolj uspešni tisti učitelji, ki razvijajo zdrav življenjski slog: imajo zdrave prehranjevalne navade, redno telesno dejavnost in čim manj nezdravih razvad (kajenje, premalo spanja, prekomerno pitje kave). Zavedamo se, da redna in pravilno dozirana gibalna dejavnost pomembno vpliva na zdravje in dobro počutje posameznika, kar posledično vpliva tudi na učinkovitost njegovega dela. Z namenom ohranjanja in krepitev telesnega ter duševnega zdravja učiteljev smo na Osnovni šoli Dragotina Ketteja Ilirska Bistrica v zadnjih letih sistematično uvedli ciljne aktivnosti. Z namenom motivacije in opolnomočenja za zdrav ter aktiven življenjski slog smo vpeljali aktivne odmore za učenci, gibalne odmore med sestanki učiteljskega zbora, izobraževanja o pozitivnih učinkih vaj za moč in gibljivost na telo ter pestro paleto popoldanskih gibalnih dejavnosti. V sodelovanju z Zdravstvenim domom Ilirska Bistrica tudi redno izvajamo meritve telesne pripravljenosti zaposlenih, analizo telesne sestave ter meritve krvnega tlaka in sladkorja v krvi. Začeli smo z majhnimi koraki in postopoma dodajali več aktivnosti, pri čemer je bil odziv zaposlenih raznolik. Na področju ozaveščanja o zdravju preko meritev sta odzivnost in zadovoljstvo visoka, medtem ko je na področju gibalnih aktivnosti zaposlenih na šoli kot tudi v prostem času zanimanje manjše.

Sklepne ugotovitve: Ohranitev zdravja je zahtevna naloga vsakega posameznika. Zdravja ne moremo jemati kot samoumevno stanje telesa in duha. Pomembno je zavedanje, da z redno gibalno dejavnostjo izboljšamo svoje psihofizične sposobnosti, ki pripeljejo tudi do večje delovne storilnosti. Spodbuda za zdrav življenjski slog je prednost tako za delovno aktivno populacijo kot tudi za njihove delodajalce, saj se lažje spopadanje z obremenitvami in boljše delovna učinkovitost odražata tako na osebni kot tudi poslovni področji.

*Ključne besede:* učitelji, zdravje, stres, gibalna aktivnost



## Exercising helps me relax and teach more easily

Vesna Boštjančič

Elementary school Dragotina Ketteja Ilirska Bistrica, Župančičeva ulica 7,  
6250 Ilirska Bistrica, Slovenia

Background and purpose: Today, practically everybody knows that physical exercise means health. Despite a high awareness of the importance of physical exercise, in practice the actual share of Slovenians who regularly exercise is significantly lower. Engaging in sufficient physical exercise is a health protecting factor, as it benefits both physical and mental health. Physical inactivity reduces general resistance, impacts the occurrence of health risk factors and contributes to the development of numerous non-communicable chronic diseases, thus lowering the quality of life of individuals. In addition to physical inactivity, stress in the work environment is becoming the second most important concern in the area of health.

Presentation of the content: Many studies have shown that performing the teaching profession is a stressful activity and that burnout among teachers is becoming an increasing problem. It is very important to learn how to manage stress, and those teachers who maintain a healthy lifestyle, i.e. who have healthy dietary habits, engage in regular physical activity, and have as few healthy vices (smoking, too little sleep, heavy coffee drinking) as possible, are more successful in achieving this. We are aware that regular physical exercise taken in proper measures has a significant impact on the health and well-being of an individual, which consequently contributes to his/her work performance. At the Dragotin Kette Primary School in Ilirska Bistrica, targeted activities have been systematically introduced in recent years, aimed at maintaining and strengthening the physical and mental health of teachers. In order to motivate and empower the school staff for a healthy and active lifestyle, we have introduced active breaks with pupils, breaks with exercises during meetings of the teachers' assembly, educational sessions on the positive effects of strength and flexibility exercises on the body, and a wide range of afternoon physical exercising activities. In cooperation with the Ilirska Bistrica Community Health Centre, we also regularly perform measurements of physical fitness of the staff, body composition analysis, and blood pressure and sugar measurements. We started with small steps, gradually adding more activities, and responses from the staff have been diverse. Regarding awareness-raising about health through measurements, responsiveness and satisfaction are high, while regarding the physical exercising activities of the staff in the school and during free time, the level of interest is lower.

Conclusions: Maintaining health is a challenging task for everybody. Health cannot be seen as a taken-for-granted state of body and mind. It is important to be aware that physical exercise improves our mental and physical capacity, which also leads to higher work performance. Motivation for a healthy lifestyle benefits both the working-age population and their employers, as easier coping with burdens and better on-the-job efficiency are reflected in both private and working life.

*Key words:* teachers, health, stress, physical exercise

## Vadba za dobro počutje in zdravo telo – primer dobre prakse gibalne vadbe za zaposlene

Vesna Boštjančič

Osnovna šola Dragotina Ketteja Ilirska Bistrica, Župančičeva ulica 7, 6250 Ilirska Bistrica, Slovenija

Izhodišča in namen: Človeško telo je ustvarjeno za gibanje, vendar je sodoben način življenja z najrazličnejšimi tehnologijami bistveno spremenil primarno potrebo človeka po gibalnih aktivnostih. Svetovna zdravstvena organizacija opozarja, da je pomanjkanje gibanja oziroma sedeč življenjski slog pomemben vzrok za mnoge kronične bolezni sodobnega časa in je tako posledično eden izmed dejavnikov, ki prispevajo k prezgodnji umrljivosti. Slovenija pri tem ni nobena izjema.

Predstavitev vsebine: Aktivna populacija v Sloveniji glede varovanja in krepitev zdravja spada med ogrožene skupine prebivalcev. Skrb za lastno zdravje je v tem obdobju pogosto zanemarjena zaradi zadovoljivega zdravstvenega stanja. Različne epidemiološke raziskave so pokazale, da gibalna dejavnost varuje pred večino kroničnih nenalezljivih bolezni, krepi kosti in mišice, vzdržuje psihofizične in funkcionalne sposobnosti telesa, pripomore k zmanjšanju stresa in depresije ter pomaga pri krepitvi samozavesti. Stroka priporoča paleto predlogov ali ukrepov, ki bi že z manjšimi spremembami na področju gibanja, prispevali k boljšemu, bolj zdravemu in prijaznejšemu delovnemu okolju za zaposlene. Upoštevanje vse prednosti in koristi, ki jih prinaša tako posredna kot tudi neposredna uvedba gibalne dejavnosti v delovno okolje, je to lahko za podjetje ali delodajalca samo korak naprej. Na podlagi določil, smernic in spodbud javnih institucij v zvezi z zdravjem na delovnem mestu so v Domu starejših občanov Ilirska Bistrica uvedli aktivnosti za varovanje in krepitev zdravja zaposlenih. Kot primer dobre prakse bo predstavljena vadba za zaposlene, ki je uravnoteženo sestavljena iz vaj za aerobno zmogljivost, gibljivost, moč in ravnotežje. Pri izvajanju redne enourne gibalne dejavnosti so bili upoštevani varnostni ukrepi ter načeli uravnotežene in učinkovite vadbe.

Sklepne ugotovitve: Uporaba različnih rekvizitov in pripomočkov je v vadbo vnesla pestrost in igrivost, medtem ko so se različne oblike dela izkazale za pomembno motivacijsko sredstvo. Vadeči so izpostavili zadovoljstvo z načinom dela, ki je vključeval postopnost in lastno izbiro intenzitete gibanja. Redna gibalna dejavnost deluje kot varovalni dejavnik, ki krepi zdravje, večja kvaliteto življenja, podaljšuje življenje, omogoča boljše počutje in izboljšanje sposobnosti ter posledično vpliva na boljšo delovno učinkovitost. Zavedanje, predvsem pa upoštevanje tega je zelo pomembno za delovno aktivno populacijo ter za njihove delodajalce.

*Ključne besede:* delovno aktivna populacija, zdravje, dobro počutje, gibalna aktivnost, primer dobre prakse

## Exercise for health and well-being – good practice example of physical exercise for employees

Vesna Boštjančič

Elementary school Dragotina Ketteja Ilirska Bistrica, Župančičeva ulica 7, 6250 Ilirska Bistrica, Slovenia

**Background and purpose:** The human body was made to move; unfortunately, contemporary lifestyles with their wide array of modern technologies have considerably influenced the primal human need for physical activity. The World Health Organisation warns that a lack of movement combined with a sedentary lifestyle is a significant cause of numerous chronic diseases, and is among the leading causes of premature death. Slovenia is no exception in this regard.

**Presentation of the content:** The working-age population of Slovenia is perceived as threatened as regards health protection and promotion. Working-age people are generally in good health, which is why they do not take good care of themselves. Different epidemiological research has shown that physical activity not only protects against the majority of non-communicable chronic diseases but also strengthens bones and muscles, maintains the psychophysical and functional abilities of the body, helps to reduce stress and depression, and boosts confidence. Professionals recommend a variety of measures that contribute to healthier and better working environments for employees. These do not require major changes; on the contrary, only minor changes in terms of movement give great results. Considering all the strengths and benefits that are gained when physical exercise is, directly or indirectly, introduced into a working environment, a company or an employer should embrace this as an opportunity for advancement. Ilirska Bistrica Old People's Home has introduced some activities for the health protection and promotion of their employees. In an attempt to offer an example of good practice, we present our workout programme for employees, which is well-balanced and incorporates exercises for aerobic capacity, mobility, strength and balance. When performing regular one-hour physical activity, safety measures as well as the principles of balanced and effective exercise were observed.

**Conclusions:** Various accessories and equipment made the experience dynamic and created a sense of playfulness, while different methods of work have been proven to be an important means of motivation. Workout programme participants pointed out satisfaction with the way the work is to include a gradual approach and their own choice of movement intensity. Regular physical activity is a protective factor that strengthens health, improves the quality and length of life, has a favourable effect on general well-being and capabilities, leading to better work efficiency. Awareness and, above all, taking into account these considerations are of great importance for the working-age population and their employers.

**Key words:** working-age population, health, well-being, physical exercise, good practice example

## Študij - priložnost za znanje in dobro počutje delovno aktivne populacije

Natalija Brečko

Šolski center Šentjur, Cesta na kmetijsko šolo 9, Šentjur, Slovenija

Anketiranje študentov po končanem študiju je ena izmed pomembnih metod za ugotavljanje zadovoljstva študentov s pridobljenim znanjem ter njihov splošni vtis. Od študentov želimo pridobiti informacije: kdo ali kaj je imel največji vpliv na odločitev za študij na naši šoli, kako so bili zadovoljni s študijem, kaj je bila za njih najpomembnejša pridobitev, kaj so pridobili s študijem, kaj je po njihovem mnenju glavna prednost in slabost študija na naši šoli. Izobraževalna ustanova s tem pridobi pomembne smernice za nadaljnje delo s študenti.

V prispevku bomo predstavili rezultate anket študentov Šolskega centra Šentjur po zaključenem diplomskem izpitu. Anketa je poleg vprašanj, ki so bila opredeljena, omogočala tudi opisne odgovore. Ankete so izpolnjevali študenti vseh štirih višješolskih študijskih programov. Največ anket so izpolnili študenti iz programa Živilstvo in prehrana (31,58 %). Študentov, ki so bili v času diplomskega izpita že zaposleni je bilo 52,64 %. Izrednih študentov (zaposlenih in delovno aktivnih) je bilo 42,10 %. Rezultati ankete so pokazali na vsebino, ki je študentom poleg formalne izobrazbe največ pomenila. To so: zadovoljstvo s pridobljenim znanjem, veščinami/ kompetencami (sem zadovoljen 42,11 %, popolnoma sem zadovoljen 57,89 %), pridobil sem sposobnost sodelovanja v skupini, timu (precej se strinjam 52,63 %, popolnoma se strinjam 47,37 %), pridobil sem socialne spretnosti (precej se strinjam 57,89 %, popolnoma se strinjam 42,11 %), pridobil sem podjetnost in samoiniciativnost (delno se strinjam 5,26 %, precej se strinjam 26,32 %, popolnoma se strinjam 68,42 %), pridobil sem spretnosti za organizacijo lastnega dela in časa (delno se strinjam 15,79%, precej se strinjam 21,05 %, popolnoma se strinjam 57,89 %), pridobil sem sposobnost raziskovanja (precej se strinjam 47,37 %, popolnoma se strinjam 52,63 %). Vsi anketiranci (100 %) pa bi svojim prijateljem/sodelavcem/otrokom svetovali študij na naši višji strokovni šoli.

Študij študentom omogoča pridobitev novih in uporabnih znanj. Študenti tekom študija vzpostavijo razvejano socialno mrežo, pristne medosebne odnose in ostale spretnosti. Študenti pridobijo višjo stopnjo izobrazbe in s tem možnosti za zaposlitev, ki si jo želijo. Veliko študentov bi študij še enkrat ponovilo, ne samo zaradi pridobljenega znanja ampak, tudi zaradi ostalih pozitivnih izkušenj, ki so vplivale na njihovo dobro počutje. Ta povratna informacija je potrditev kakovostne izvedbe študijskega programa ter dela in odnosa zaposlenih. Na osnovi rezultatov anket šola pripravi analizo (prednosti, slabosti, priložnosti, nevarnosti) in akcijski načrt. Ugotovitve se objavi na spletni strani šole ter opravi primerjavo z drugimi šolami.

*Gljučne besede:* zadovoljstvo študentov, pridobljene sposobnosti, zaposlitev

## Study - opportunity for knowledge and well-being of the working-age population

Natalija Brečko

Šolski center Šentjur, Cesta na kmetijsko šolo 9, Šentjur, Slovenia

Interviewing students after they complete the study is one of the important methods for establishing their satisfaction with the achieved knowledge and their impression in general. From students we want to get information: who or what had the biggest influence on their decision to study at our school, how satisfied they were with study, what was for them the most important acquisition, what they gained with their study, what in their opinion is the main advantage and disadvantage of studying at our school. The educational institution with this gains important guidelines for further work with students.

In this paper we will present results of a survey from students of the School Centre Šentjur after their diploma exam. In addition to the questions that were defined, the survey provided descriptive answers. The surveys were completed from students of all four higher vocational programs. Most of the surveys were completed by students from the Food and Nutrition program (31.58 %). Students who were already employed at the time of the diploma exam was 52.64 %. Part-time students (employed and work active) was 42.10 %. Results of a survey have shown on the content that is most important for students besides formal education. These are: satisfaction with the acquired knowledge, skills/ competences (satisfied with 42.11 %, completely satisfied with 57.89 %), I gained the ability to participate in a group, a team (pretty much agree 52.63 %, agree entirely 47.37 %), I gained social skills (pretty much agree 57.89 %, agree entirely 42.11 %), I gained entrepreneurship and self initiative (I partially agree 5.16 %, pretty much agree 26.32 %, agree entirely 68.42 %), I gained the skills to organize my own work and time (partially agree 15.79 %, pretty much agree 21.05 %, agree entirely 57.89 %), I gained the ability to research (pretty much agree 47.73 %, agree entirely 52.63 %). All the respondents (100 %) would advise their friends/ colleagues/ children to study at our Higher Vocational school.

Study for students enables to acquire new and useful knowledge. Students during their study establish an extensive social network, genuine interpersonal relationships and other skills. Students gain a higher level of education and opportunity for performing a job they want. A lot off students would repeat the study, not just because of the knowledge they gained, but also due to other positive experiences which affected their well-being. This feedback is a confirmation of the quality implementation of the study program and the work and attitude of the employees. Based on the survey results, the school prepares an analysis (strengths, weaknesses, opportunities, threats) and an action plan. The findings are published on the school's website and compared with other schools.

*Key words:* student's satisfaction, gained abilities, employment

## Raziskovalna dela izrednih študentov na področju prehrane in zdravja

Natalija Brečko

Šolski center Šentjur, Cesta na kmetijsko šolo 3230 ,9 Šentjur, Slovenija

Študenti (izredni in redni) zaključijo študij na višji strokovni šoli z diplomskim izpitom. Diplomski izpit je sestavljen iz diplomske naloge in zagovora. Diplomska naloga je rezultat samostojnega dela študenta, ki raziskuje prepoznaten in točno določen problem iz prakse. Tema diplomske naloge se nanaša na vsebine višješolskega študijskega programa in predstavi praktične rešitve. V tem prispevku bomo predstavili raziskovalna dela iz programa Živilstvo in prehrana. Vsebine diplomske naloge so povezane z živilstvom in prehrano ter z delovnimi področji podjetja, kjer je študent opravljal praktično izobraževanje. Izredni študenti, ki so v večini zaposleni in delovno aktivni si temo diplomske naloge izberejo v podjetju, kjer so zaposleni. 31 % diplomskih nalog izrednih študentov se nanaša na točno določeno podjetje. Študentje so imeli poleg mentorja predavatelja višje strokovne šole tudi mentorja v podjetju, kjer so pod njegovim mentorstvom izvajali raziskovalni del naloge. Preostalih 69 % študentov je v raziskovalnem delu naloge predstavilo strokovne teme in rešitve iz živilstva in prehrane, ki niso vezane na točno določeno podjetje. V prispevku bomo predstavili raziskovalna dela izrednih študentov, ki se nanašajo na strokovno področje Prehrana in zdravje. V raziskovalnem delu naloge so študenti raziskovali teme: Priprava na pridobitev certifikata IFS Food v podjetju Agona d.o.o., Poznavanje izraza zdrava prehrana, Prehrana bolnikov z akutno levkemijo, Dvig krvnega sladkorja glede na določena živila pri sladkornih bolnikih tipa I, Ugotavljanje porasta števila diet v vrtcih, Vpliv prehranjevalnih navad na nosečniški diabetes, Načrtovanje prehrane dijakov in uporabnost spletnega portala šolski lonec, Vpliv fizikalnih dejavnikov na kakovost čokoladne deklaracije, Verifikacija HACCP sistema Term Olimia d.d., Ugotavljanje vzrokov kontaminacije finih pekovskih izdelkov s plesnimi in insekti, Prisotnost gensko spremenjenih organizmov v živilih, Pomen prehrane za bolnike s kronično ledvično odpovedjo, Obvladovanje legionele v vrtcu Ciciban Sevnica, Vpliv beljakovin v različnih vrstah mleka na pojav alergij pri otrocih, itd. Študenti s svojim delom raziskujejo praktične primere in predlagajo rešitve s področja prehrane in zdravja. Rezultati so javno predstavljeni in objavljeni. Z ugotovitvami raziskave in rešitvami so seznanjena podjetja, kjer se je izvajala raziskava. Podjetja pogosto te predloge upoštevajo pri iskanju izboljšav tehnoloških postopkov, ki vodijo k uspešnejšemu poslovanju podjetja. Na splošno pa te raziskave veliko pripomorejo k ozaveščenosti ljudi o pomenu prehrane za zdravje.

*Ključne besede:* raziskovalna dela, prehrana in zdravje, delovno aktivni -izredni študenti

## Research tasks of part time-students on the nutrition and health topic

Natalija Brečko

Šolski center Šentjur, Cesta na kmetijsko šolo 3230 ,9 Šentjur, Slovenia

Students (part-time and full-time) finish their study at the higher vocational school with diploma exam. Diploma exam consists of diploma thesis and presentation. The diploma thesis is the result of the student's independent work, which explores a recognizable and exactly specified problem from practice. The topic of the diploma thesis refers to contents of the higher vocational educational program and presents practical solutions. In this paper we will present research tasks from the Food and Nutrition higher vocational program. The contents of the diploma thesis are referring to the food and nutrition and to the areas of work in the company where the student take practical training. Part-time students, who are mostly employed and work active, choose a diploma topic in the company where they are employed. 31% diploma thesis of part-time students are related to a specific company. The students in addition to the mentor at the higher vocational school had a mentor at the company. Under his mentorship they conducted a research part of the diploma thesis. The remaining 69% students in the research part of the thesis presented topics and solutions in food and nutrition, which are not referring to a specific company. In this paper we will present research tasks of part-time students which are referring to the nutrition and health topics. In the research part of the diploma thesis, students explored topics: Preparing for the IFS Food certification at Agona d.o.o., Knowing the term healthy eating, Nutrition of patients with acute leukemia, Increasing blood sugar related to certain foods in type I diabetic patients, Findings of the increase number of diets in kindergartens, The influence of eating habits on pregnant diabetes, Nutrition planning for students and the usefulness of the school pot online portal, The influence of physical factors on the quality of the chocolate declaration, Verification of the HACCP system in Term Olimia d.d., Identifying causes of contamination on fine bakery products with molds and insects, The presence of genetically modified organisms in food, Importance of diet for patients with chronic renal failure, Controlling legionella in kindergarten Ciciban Sevnica, Influence of protein in different types of milk on the occurrence of allergies at children, etc. Through their work, students explore practical cases and propose solutions in the nutrition and health. The results are publicly presented and published. With the research findings and solutions are informed companies, where the research was conducted. Companies often take notice on these suggestions at seeking improvements in technological process, which leads to successful business. In general this researches help raise awareness of the importance of nutrition for health.

*Key words:* research tasks, nutrition and health, work active-part time students

## Vloga komunikacije za spodbujanje dobrega počutja v zdravstvenem timu: presečna raziskava

Mihela Čeč,<sup>1</sup> Nastja Podrekar<sup>2,1</sup>

<sup>1</sup> Fakulteta za vede o zdravju, Univerza na Primorskem, Polje 42, 6310 Izola, Slovenija

<sup>2</sup> InnoRenew Coe, Zdravje v grajenem okolju, Livade 6, 6310 Izola, Slovenija

Izhodišča in namen: Timsko delo je najbolj razširjena oblika dela v zdravstvu, ki združuje posameznike različnih zdravstvenih strok. Posamezniki različnih zdravstvenih strok v okviru svojih kompetenc rešujejo zdravstvene probleme pacienta ter načrtujejo njegovo zdravstveno oskrbo. Prav zato so ključnega pomena zdravje, dobro počutje in komunikacija vseh, ki so del zdravstvenega tima. Namen raziskave je bil opredeliti vlogo komunikacije v zdravstvenem timu za spodbujanje dobrega počutja.

Predstavitev vsebine: V presečni raziskavi je bila na priložnostnem vzorcu 64 zdravstvenih delavcev (65 % žensk, starost  $35 \pm 9$  let) uporabljena kvantitativna deskriptivna metoda. Podatki so bili zbrani s pomočjo vprašalnika sestavljenega iz petih sklopov, ki so spraševali o vlogi tima, njegovi dinamiki in vodenju ter pomenu komunikacije in prepoznanih vplivov na kakovost. Odgovori so bili analizirani s pomočjo opisne statistike in frekvenčne porazdelitve. Več kot polovica anketirancev se strinja, da timsko delo pozitivno vpliva na uspeh in učinkovitost pri delu ter zmanjšuje tveganje za napake pri delu. Vendar je petina anketiranih mnenja, da sodelovanje med zdravstvenimi timi ni dobro, da primanjkuje zaupanja med skupinami ter da člani znotraj zdravstvenega tima nimajo enakih možnosti pri odločanju o skupinskih zadevah. Prav tako več kot dve tretjini anketirancev meni, da so v zdravstvenih timih prisotni hierarhični odnosi. Skoraj polovica anketiranih je mnenja, da so napake najpogosteje posledica slabe komunikacije v timu.

Sklepne ugotovitve: Anketirani se zavedajo dodane vrednosti uspešnega timskega dela v zdravstvu. Kljub temu lahko na podlagi izvedene ankete sklepamo, da je v slovenskih zdravstvenih timih do določene mere prisotna neenakost med člani tima, kar se lahko odraža v slabši komunikaciji in posledično vpliva tudi na slabše počutje in kakovost dela zdravstvenega tima. Za boljše počutje zdravstvenih delavcev na delovnem mestu se predlaga izvajanje programov promocije zdravja za izboljšanje komunikacije in posledično počutja znotraj zdravstvenih timov. Izvedena raziskava, ki ima sicer določene omejitve, kot sta uporaba vrste vzorčenja, majhno število anketirancev ter morebitna subjektivnost glede na kontekst zdravstvene organizacije, kljub temu nudi vpogled v interakcijo v zdravstvenih timih.

*Ključne besede:* zdravje, timsko delo, zdravstveni delavci



## Role of communication to promote well-being in the healthcare team: cross-sectional study

Mihela Čeč,<sup>1</sup> Nastja Podrekar<sup>2,1</sup>

<sup>1</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

<sup>2</sup> InnoRenew Coe, Human Health in the Built Environment, Livade 6, 6310 Izola, Slovenia

**Introduction and aim:** Teamwork is the most widespread form of work in healthcare, bringing together individuals from different healthcare professions. Individuals of various medical professions solve the patient's health problems within their competencies and plan their medical care. Consequently, good health, well-being, and communication of everyone who is part of the healthcare team is crucial. The aim of this research was to assess the role of team communication in promoting well-being of the Slovenian healthcare professionals.

**Content:** In a cross-sectional study, a quantitative descriptive method was used on a random sample of 64 healthcare professionals (65% women, age  $35 \pm 9$  years). Data were collected using a questionnaire consisting of five sets, which asked about the role of the team, its dynamics and leadership, the importance of communication, and impacts on quality. Results were analysed using descriptive statistics and frequency distribution. More than half of the respondents agreed that teamwork has positive effect on success and job satisfaction and reduces the risk of mistakes at work. However, a fifth of respondents believed cooperation between health teams is not good, that there is a lack of trust between teams and that members within the health team do not have equal opportunities in deciding on group matters. Also, more than two-thirds of respondents believed that hierarchical relationships are present in health teams. Almost half of the respondents believed mistakes are most often the result of poor communication in the team.

**Conclusion:** Slovenian healthcare professionals are aware of the added value of successful teamwork in healthcare. Nevertheless, based on the survey, we can conclude that in Slovenian health teams there is a certain degree of inequality between team members, which can be reflected in poorer communication and poorer well-being and quality of work of the health team. To improve the well-being of health professionals at the workplace, it is suggested to implement specific health promotion programs to improve communication and consequently well-being within health teams. The conducted research has certain limitations, such as the use of the subjective method, small number size and possible subjectivity according to the context of the health care organization. Nevertheless, the results offer an insight into the current situation regarding the interaction in healthcare teams.

**Key words:** health, teamwork, health care professionals

## Brezplačni interventni programi v podporo družini in posameznikom v stiski

Nataša Demšar Pečak

Ministrstvo za delo, družino, socialne zadeve in enake možnosti, Štukljeva 44, 1000 Ljubljana, Slovenija

S prispevkom želimo izpostaviti pomen brezplačnih interventnih programov pri opolnomočenju uporabnikov pri iskanju psihosocialne pomoči in podpore. Namen prispevka je nasloviti pomen mreže različnih programov v podporo družini in posameznikom v stiski, ki se srečujejo z različnimi življenjskimi preizkušnjami in izzivi ter pri katerih potrebujejo strokovno pomoč, saj jim sami niso kos. Velik problem lahko identificiramo na primer ravno na področju dolgih čakalnih dob ne plačljivih, terapevtskih in psihosocialnih storitev. Zaradi tega prihaja do razslojevanja, namreč, plačljive storitve si lahko privoščijo le finančno močnejše družine in posamezniki. V prispevku bomo predstavili tudi pomen povezovanja ciljnih skupin s povezovanjem nevladnih organizacij, ki nudijo različne oblike pomoči, ozaveščenost o možnostih njihovega vključevanja v programe in predvsem informiranost o dostopnosti psihosocialnih programov v pomoč družini in posameznikom v stiski. Programi so oblikovani za posamezna področja oziroma posamezne ciljne skupine in so financirani s strani Ministrstva za delo, družino, socialne zadeve in enake možnosti. Pristojno ministrstvo je v letu 2019 sofinanciralo 170 različnih socialnovarstvenih programov, na podlagi javnih razpisov v letih 2018 - 2020 pa sofinancira/financira tudi 26 programov v podporo družini, in sicer 11 izvajalcev vsebin centrov za družine in 15 programov psihosocialne pomoči otrokom, mladostnicam in mladostnikom oziroma njihovim družinam. Ustrezno pomoč, psihosocialno svetovanje in nastanitev lahko nudijo le izvajalci, ki imajo veljavno verifikacijo ali pa veljavno pozitivno mnenje s strani Socialne zbornice Slovenije. Prav tako v okviru sredstev Operativnega programa za izvajanje evropske kohezijske politike v obdobju 2014 – 2020, pristojno ministrstvo sofinancira Večgeneracijske centre, ki se smiselno dopolnjujejo z vsebinami omenjenih programov. Poleg nalog, ki se izvajajo v okviru javnih služb pa številne naloge uspešno izvajajo tudi nevladne organizacije, ki prevzemajo pobudo za zagotavljanje različnih socialnovarstvenih aktivnosti. Omenimo lahko, da se v zadnjih mesecih veliko družin zaradi pandemije korona virusne bolezni 2019 (COVID-19), sooča s travmatičnimi dogodki in izgubami, kot so izguba zaposlitve in posledično izguba socialne ter ekonomske varnosti, izguba zdravja, lahko tudi izguba bližnjega itd. S temi intervencijami si država, za boljšo možnost enake dostopnosti, želi doseči ranljive skupine in zmanjšati neenakost pri dostopnosti tovrstnih storitev. Z omenjenimi programi lahko dosežemo zmanjševanje različnih čustvenih stisk in motenj v duševnem zdravju, spremembo neustreznih vzorcev vedenja, preprečevanje nasilja, preprečevanje zlorabe drog in alkohola, izboljšanje medsebojnih odnosov, oblikovanje socialnih vlog posameznika kot tudi podporo pri lažjem usklajevanju družinskega in poklicnega življenja.

*Ključne besede:* psihosocialna pomoč, intervencije, duševno zdravje, vedenjski vzorci, družinski odnosi

## Free interventions to support families and individuals in need

*Nataša Demšar Pečak*

*Ministry of Labour, Family, Social Affairs and Equal Opportunities, Štukljeva 44,  
1000 Ljubljana, Slovenia*

With this article, we want to emphasize the importance of free intervention programs in empowering users to seek psychosocial help and support. The purpose of article is to addresses the importance of a network of various programs to support families and individuals in need who face various life trials and challenges and who need professional help because they cannot cope with them. A major problem can be identified, for example, in the area of long waiting periods for unpaid, therapeutic and psychosocial services. As a result, stratification occurs, namely, only financially stronger families and individuals can afford paid services. The paper will also present the importance of connecting target groups by connecting non-governmental organizations that offer various forms of assistance, awareness of the possibilities of their inclusion in programs and especially information on the availability of psychosocial programs to help families and individuals in need. The Ministry of Labour, Family, Social Affairs and Equal Opportunities fund the programs. In 2019, Ministry co-financed 170 different social welfare programs, and based on public tenders in 2018-2020 it co-finances 26 programs in support of the family, namely 11 providers of family centres and 15 psychosocial assistance programs for children and adolescents. Providers who have a valid verification or a valid positive opinion from the Social Chamber of Slovenia can only provide appropriate assistance, psychosocial counselling and accommodation. Also within the funds of the Operational Programme for the Implementation of the European Cohesion Policy in the period 2014-2020, the Ministry co-finances the Multigenerational Centres, which are mutually complementary with the contents of the mentioned programs. In addition to the tasks performed within the framework of public services, many tasks are also successfully performed by non-governmental organizations that take the initiative to provide various social welfare activities. It can be mentioned that in recent months many families are facing traumatic events and losses due to the coronavirus disease pandemic 2019 (COVID-19), such as loss of employment and consequent loss of social and economic security, loss of health, possibly loss of loved ones, etc. Through these interventions, the state wants to reach vulnerable groups and reduce inequalities in the accessibility of such services in order to improve the possibility of equal access. Mentioned different programs can reduce various emotional distress and mental health disorders, change inappropriate behaviour patterns, prevent violence, prevent drug and alcohol abuse, improve family relationships, create social roles of the individual, and support easier reconciliation of family and professional life.

*Key words:* psychosocial support, interventions, mental health, behavior patterns, family relationships

## Izmensko delo medicinskih sester: vpliv na zdravje

Lidija Dornik

Visoka zdravstvena šola v Celju, Mariborska cesta 7, 3000 Celje, Slovenija

**Uvod:** Delo je pomembno za preživetje in osebni dosežek posameznih ljudi, obenem pa vpliva na življenjski slog ljudi, ki so v delovnem procesu in vodi do raznoraznih zdravstvenih težav, s katerimi se soočajo zaposleni. Izmensko delo in nočno delo je s prenatrpanostjo, pomanjkanjem kadra in pomanjkanjem kontrole, povezano z izgorelostjo, osebnostno izčrpanostjo, dolgi urniki pa tudi s povečano telesno težo. Na kvaliteto življenja, preutrujenost, obolenost, učinkovitost in splošno zadovoljstvo z delom medicinskih sester odraža posluš delodajalca za urejen urnik, relaksacijo, psihološko podporo in dostopa do kotičkov za sproščanje.

**Metode:** Uporabili smo metodo kvantitativnega raziskovalnega pristopa z deskriptivno metodo raziskovanja. Uporabili smo metodo pregleda znanstvene literature, ki temelji na dostopnosti, vsebinski ustreznosti in aktualnosti. Dostopali smo preko elektronske povezave v knjižnici Celje. Omejitveni kriteriji so bili za obdobje od januarja 2017 do aprila 2020, angleški jezik, na voljo za prenos, celotno besedilo in znanstvene revije s ključnimi besedami »nurse«, »shift work«, »night shift« in »health« v podatkovnih bazah EBSCO in MEDLINE. Rezultate smo ponazorili z metodologijo pregleda PRISMA. Raziskava je potekala v mesecu aprilu in maju 2020. Za prikaz rezultatov smo uporabili program MS Word.

**Rezultati:** Za pregledni znanstveni članek smo uporabili, pregledali in obdelali 21 člankov v polnem besedilu, po uporabi vključitvenih kriterijev: medicinska sestra, pogoji dela, vrsta dela, povezava z zdravjem, vrsto publikacije, časovnega obdobja, jezika in dostopnosti celotnega besedila, je v končno raziskavo vključenih 11 znanstvenih člankov. Ugotovili smo, da nočno delo z mnogimi dejavniki negativno vpliva na zdravje medicinskih sester. To se kaže kot izgorelost, izčrpanost, preutrujenost, vpliva na depresijo, tesnobo, zbranost, pojavnost napak, bolečine v hrbtu, slabe prehranjevalne navade, vse skupaj pa močno vpliva na nivo stresa. Slabša je tudi kakovost spanja, porušen je vzorec spanja in več se nespečnost.

**Razprava in zaključek:** Ugotovitve kažejo, da medicinske sestre, ki delajo v izmenah in opravljajo tudi nočno delo, ugotavljajo slabšo kakovost življenja, slabo kvaliteto spanja, višji stres na delovnem mestu, imajo manj časa za družino, socialne stike in fizično aktivnost in so bolj nagnjene k prekomerni telesni teži in razvoju kroničnih bolezni. Vse to je zaskrbljujoče za splošno dobro počutje medicinskih sester in njihovo zdravje. Delodajalci bi morali dobro organizirati izmensko delo, dneve počitka in obremenjenost medicinskih sester. Tako bi lažje ohranjali, vzpodbujali dobro psihofizično stanje medicinskih sester in z zgledi za paciente povečevali zdrav življenjski slog in nivo zdravja zaposlenih medicinskih sester.

**Ključne besede:** medicinska sestra, izmensko delo, nočno delo, zdravje

## Nurses' shift work: impact on health

Lidija Dornik

College of Nursing in Celje, Mariborska cesta 7, 3000 Celje, Slovenia

**Introduction:** Work is important for the survival and personal attainment of individual people, but it also affects the lifestyle of people who are in the work process and leads to various health problems that employees are facing. Shift work and night work are associated with burnout, lack of personnel and lack of control effect on burnout, personal exhaustion, long working hours are associated also with excess body weight. Quality of life, tiredness, sickness, effectiveness and overall satisfaction with the work of nurses reflects the employer's sense for an appropriate time schedule, relaxation, psychological support and access to relaxation spaces.

**Methods:** We used the quantitative research approach method with the descriptive research method. We used the method of reviewing of the scientific literature based on accessibility, content relevance and actuality. We accessed it via an electronic link in the Celje Library. The restrictive criteria were the period January 2017 to April 2020, English language, availability for download, full text and scientific journals with the keywords „nurse“, „shift work“, „night shift“ and „health“ in the EBSCO and MEDLINE databases. The results were presented using the PRISMA review methodology. The survey was conducted in April and May 2020. MS Word was used to display the results.

**Results:** We have used, reviewed and processed 21 full-text articles for a review scientific article, after applying the inclusion criteria: nurse, working conditions, type of work, health link, type of publication, time period, language and availability of the full text, so 11 scientific articles are included in the final research. We found out that night work with many factors has a negative impact on the health of nurses. This is manifested as burnout, exhaustion, fatigue, depression, anxiety, concentration, chance for defects, back pain, poor eating habits, all of which have a profound effect on stress levels. The quality of sleep is also worse, the pattern of sleep is broken and insomnia increases.

**Discussion and conclusions:** Findings show that nurses who work shifts and also do night work feel poorer quality of life, poor quality of sleep, higher stress level at work, have less time for family, social contacts and physical activity and are more prone to overweight and development of chronic diseases. All this is of concern for the general well-being of nurses and their health. Employers should be able to well organize the shift work, rest days and the workload of nurses. This would make it easier to maintain, promote the good psychophysical status of nurses and increase healthy lifestyles and health levels of employed nurses through patient-centered examples.

**Key words:** nurse, shift work, night shift, health

## Kostno-mišična obolenja vzgojiteljev predšolskih otrok

*Jera Gregorc, Mira Dolenc*

*Univerza v Ljubljani, Pedagoška fakulteta, Kardeljeva ploščad 16, 1000 Ljubljana, Slovenija*

Uvod: Poklic vzgojitelja predšolskih otrok (VPO) je fizično in psihično zahteven ter tako predstavlja tveganje za nastanek kostno-mišičnih obolenj. Namen raziskave je zato ugotoviti, kako pogosto se med VPO pojavljajo kostno-mišična obolenja, kateri predeli telesa so najpogosteje prizadeti in ugotoviti, ali obstaja povezanost med zaznavnostjo bolečin in dejavniki tveganja za njihov nastanek.

Metode: V raziskavo smo vključili 155 VPO iz različnih vrtcev osrednjeslovenske regije, ki so odgovorili na vprašanja rekonstruiranega anketnega vprašalnika CMDQ (angl. Cornell Musculoskeletal Discomfort Questionnaires) (Hedge in sod., 1999). Vprašalnik je bil razdeljen na 3 dele. Prvi del je obsegal vprašanja demografskega tipa, drugi vprašanja o občutenju stresa ter o pogostosti in intenzivnosti ukvarjanja z gibalnimi/športnimi aktivnostmi, tretji del pa samoočeno zaznave bolečin v mišicah in sklepih. Podatke smo obdelali s statističnim paketom SPSS – 22.0. Uporabili smo opisno in inferenčno statistiko (Hi-kvadrat test enakih verjetnosti, t-test za neodvisne vzorce ter bivariantno analizo povezanosti).

Rezultati: Ugotovili smo, da več kot polovica VPO zaznava kostno-mišična obolenja, najpogosteje v spodnjem delu hrbta (52%). VPO pogosteje in intenzivneje zaznavajo težave v vratu, ramenih ter zgornjem in spodnjem delu hrbta, kot v rokah in kolenih. Ugotovili smo tudi, da imajo tisti VPO, ki ocenjujejo svoje delo bolj stresno, več težav z bolečinami v mišicah in sklepih. Med najbolj problematičnimi aktivnostmi, pri katerih občutijo bolečine, so VPO izpostavili sklanjanje, dvigovanje otrok, sedenje na otroških stoli in čepenje.

Razprava in zaključek: Glede na dobljene podatke menimo, da bi bilo smiselno ponuditi VPO izobraževanja in usposabljanja glede biomehanike in uporabe pravih tehnik dvigovanja bremen, izvesti ergonomske prilagoditve v igralnici ter izvajati krajše programe ustrezne gibalne vadbe na delovnem mestu.

*Ključne besede:* kostno-mišična obolenja, vzgojitelj predšolskih otrok, dejavniki tveganja

## Musculoskeletal disorders among preschool teachers

*Jera Gregorc, Mira Dolenc*

*University of Ljubljana, Faculty of Education, Kardeljeva ploščad 16, 1000 Ljubljana, Slovenia*

**Introduction:** The profession of pre-school teacher (PST) is physically and mentally demanding and thus poses a risk to musculoskeletal disorders. The purpose of the study is therefore to determine how often musculoskeletal disorders occur among PST, which parts of the body are most affected, and to analyze whether there is a connection between pain perception and the risk factors.

**Methods:** The research has included 155 PST from different kindergartens in the Central Slovenian region, who have answered questions from the reconstructed Cornell Musculoskeletal Discomfort Questionnaires CMDQ (Hedge et al. 1999). The questionnaire was divided into 3 sections. The first part covered demographic questions, the second questions about stress and frequency and intensity of motor / sport activities, and the third part was a self-evaluation assessment of muscle and joint pain. Data were processed with the statistical package SPSS - 22.0. Descriptive and inferential statistics were used (Hi-square test of equal probabilities, t-test for independent samples, and bivariate correlation analysis).

**Results:** We found out that more than half of PST detect musculoskeletal disorders, most commonly in the lower back (52%). PST more frequently and intensely perceive problems in the neck, shoulders and upper and lower back than in the arms or knees. We also found that those PST who evaluate their work more stressfully have more problems with muscle and joint pain. Among the most problematic pain-relieving activities, PST emphasized leaning, lifting of children, sitting on children's chairs and squatting.

**Discussion and conclusions:** Based on the data obtained, we believe it would be reasonable to offer PST of biomechanics education and training and the use of proper load-lifting techniques, to make ergonomic adjustments in the playroom, and to carry out shorter work-appropriate exercise programs.

**Key words:** musculoskeletal disorders, preschool teacher, risk factors

## Poznavanje vina kot dejavnik varnega uživanja vina pri mladostnikih

Jurij Gunzek

Šolski center Šentjur, Cesta na kmetijsko šolo 3230 ,9 Šentjur, Slovenija

Slovenija je vinogradniška dežela z dolgoletno tradicijo. Vino je pomemben pridelek v trženju in turističnem segmentu. Na vinu temelji prepoznavnost Slovenije kot vinske in turistične destinacije v Evropi in svetu. Strokovna literatura navaja preko 1300 različnih sestavin v grozdju, moštu in vinu. V prispevku predstavljamo ugotovitve o poznavanju vina do katerih smo prišli z anketiranjem mlajše populacije (18 do 25 let). Anketirali smo 100 mladostnikov iz celjske, ljubljanske, mariborske in dolenske regije. Anketirane smo povprašali o poznavanju različnih sort vinske trte, samo 25 % vprašanih je zapisalo imena 5 ali več žlahtnih sort vinske trte. Poznavanje sestave vina je glede na odgovore anketiranih slabo. Velika večina anketiranih (71 %) meni, da vino vsebuje zgolj do 100 različnih spojin. Slabo poznavanje sestave vina se je potrdilo pri vprašanju, pri katerem smo želeli, da anketirani zapišejo imena treh, petih ali desetih spojin v vinu. Največ odgovorov smo dobili v prvi skupini, 64 % anketiranih je navedlo da vedo, da vino vsebuje vodo, alkohol in sladkor. Samo 5 % anketiranih je pravilno zapisalo 10 ali več spojin v vinu. Zanimalo nas je tudi, ali mladostniki poznajo razvrstitev vin v različne kakovostne razrede. Samo 37 % anketiranih je navedlo, da se vina glede kakovosti razvrščajo v kategorijo deželnih, kakovostnih ali vrhunskih, ostali so navajali izraze kot so: višji, nižji, kvalitetno, boljše, slabše, dražji, cenejši, prvovrstno ... ali pa so pustili prazen prostor. Anketirane smo tudi povprašali, kaj bi bila njihova izbira glede sladkega okusa vina. Večina bi najraje izbrala polsladko vino, sledi sladko, polsuho in suho vino. Na vprašanje o izbiri vina glede barve, so bili odgovori skoraj enakomerno razdeljeni, nekaj več vprašanih bi raje poseglo po belem vinu kot po rdečem. Iz odgovorov anketnih vprašalnikov ugotavljamo, da je pri mladostnikih poznavanje vina skromno. Večina vprašanih je izrazila, da je informacij o vinu dovolj, da jih najraje pridobijo s spleta, četrtnina vprašanih pa si znanje o poznavanju vina nadgradi z obiskom prireditelj, povezanih s promocijo vina.

*Ključne besede:* poznavanje vina, mladostniki, spojine v vinu



## Knowledge about wine as a factor of safe use of wine among young population

*Jurij Gunzek*

*Šolski center Šentjur, Cesta na kmetijsko šolo 3230 ,9 Šentjur, Slovenia*

Slovenia is a wine-growing country with a long tradition. Wine is an important product in the marketing and tourism segment. Slovenia is known as a wine and tourist destination in Europe and in the world. In professional literature there is listed over 1300 different ingredients in grapes, musts and wine. In this paper we will present findings that were obtained by interviewing a younger population (18 to 25 years old) regarding knowledge about wine. We interviewed a 100 young people from Celje, Ljubljana, Maribor and Dolenjska region. The young people that we interviewed we asked about knowing different vine varieties. Only 25% of the respondents wrote down the names of 5 or more noble vine varieties. Knowledge about ingredients in the wine is according to the respondents poor. The majority (71%) believes that wine contains only up to 100 different ingredients. Poor knowledge about the ingredients in the wine was confirmed by the question where we wanted the respondents to write down the names of three, five or ten ingredients in the wine. Majority of the answers we received in the first group. 64% of respondents stated that they knew that wine is containing water, alcohol and sugar. Only 5% respondents wrote 10 or more ingredients. We were also interested in whether are familiar with the classification of wines into different quality classes. Only 37% of respondents answered that quality wines were categorized as country, quality or premium. Others used terms such as: higher, lower, quality, better, worse, more expensive, cheaper, first-class, ... or left empty space. We also asked the respondents about their choice regarding the sweet taste of the wine. Most of them would prefer semi-sweet wine, followed by sweet, semi-dry and dry wine. When we asked about the choices regarding the color of the wine, the answers were almost evenly split, with a few more respondents preferring white wine rather than red wine. From the answers we found out that the knowledge about wine is among young people poor. Most of the respondents wrote that there is enough information about wine and they get it on web. A quarter of respondents are upgrading their knowledge about wine with attending events related to wine promotion.

*Key words:* knowledge about wine, young population , ingredients in wine

## **Z dokazi podprta izbira katetra za intermitentno samokatetrizacijo: Integrativni pregled literature**

*Tjaša Hrovat Ferfolja, Melita Peršolja*

*Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija*

**Uvod:** Intermitentna katetrizacija je znana kot varna metoda, primerna za dolgotrajno uporabo, ki zaščiti zgornja sečila in izboljša kakovost življenja pacientov s težavami izločanja. Cilj te raziskave je bil določiti optimalno vrsto katetra za intermitentno katetrizacijo ob upoštevanju izidov pri pacientu.

**Metode:** Uporabljen je bil pregled literature. Iskalni izrazi so bili samokatetrizacija, krvavitev, poškodba, okužba, material, vrsta katetra, dolžina, obseg, oblika, prevleka, pakiranje. Uporabljeni so bili logični operaterji (AND, OR). Iskanja so bila omejena na znanstvene revije, dostopnost do celotnega besedila, angleščino in slovenski jezik ter čas objave med letoma 1999 in 2019. Za pridobitev in potrditev literature smo uporabili štiristopenjsko strategijo iskanja PICO. Pregled literature je bil opravljen julija 2019.

**Rezultati:** Izmed 440 najdenih zadetkov je bilo 41 izbranih glede na namen raziskave in kakovost prispevka. Izbrane raziskave so bile: 16 pregledov literature, 4 randomiziranih kliničnih raziskav, 20 kohortnih raziskav in ena študija primera. Sinteza pregleda je bila izvedena z orodjem PRISMA. Kakovost raziskav sta ocenila dva recenzenta z uporabo hierarhije dokazov.

**Razprava in zaključek:** S pregledom literature smo ugotovili, da nobene vrste katetrov ni mogoče na splošno priporočiti za intermitentno katetrizacijo. Zaradi pomanjkanja dokazov je izbira katetra odvisna predvsem od pacientove izbire vrste katetra glede na izbrano tehniko samokatetrizacije. Ta integrativni pregled lahko služi kot referenca za zdravstvene delavce pri skrbi za novega pacienta z zastajanjem urina. Priporočljivo je, da medicinske sestre in pacienti najprej izberejo tehniko samokatetrizacije in šele nato izberejo vrsto katetra.

**Ključne besede:** z dokazi podprta praksa; intermitentna katetrizacija; pregled literature; kakovost storitev, izidi pri pacientu

## Evidence-based catheter selection for intermittent self-catheterization: Integrative review

*Tjaša Hrovat Ferfolja, Melita Peršolja*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** Intermittent catheterization is known as a safe method suitable for long-term use that can protect the upper urinary tract and improve the quality of patients' life with significant voiding problems. This research aimed to identify an optimal type of catheter for intermittent self-catheterization considering patient outcomes.

**Methods:** A literature review was used. The search terms were self-catheteriz(s)ation, bleeding, injury, infection, material, catheter type, length, circumference, shape, coating, packing. Boolean operators (AND, OR) were used. Searches were limited to scientific journals, full text accessibility, English and Slovene language, and publication time between 1999 and 2019. We used a four-step PICO search strategy to obtain and validate the literature. The literature review was performed in July 2019.

**Results:** From 440 results found, 41 were selected according to the purpose and quality of the research. The selected research were 16 literature reviews, 4 randomized control trials, 20 cohort research, and one case study. The synthesis of the review was done using the PRISMA tool. The quality of the research was assessed by two reviewers using hierarchy of evidence.

**Discussion and conclusions:** The review found that none of the catheter types can be generally recommended for intermittent self-catheterization. Due to the lack of evidence, the selection of the catheter depends primarily on the patients' preference of the catheter type considering selected technique of self-catheterization. This integrative review may serve as a reference for healthcare workers in caring for a new patient with urine retention. It is recommended that nurses and patients together firstly select the technique of self-catheterization, and only after that select the catheter type.

**Key words:** evidence-based nursing; intermittent urethral catheterization; literature review; patient outcome assessment; quality assurance

## Celiakija – izkušnje pacientov

Manca Košelnik, Mateja Bahun

Fakulteta za zdravstvo Angele Boškin, Spodnji Plavž 3, 4270 Jesenice, Slovenija

**Uvod:** Celiakija je resna avtoimunska bolezen, ki se pojavi pri posameznikih, ki imajo genetske predispozicije in jim zaužitje glutena povzroči poškodbe v tanem črevesju. Medicinska sestra mora pri obravnavi pacienta s celiakijo ob znanju s področja zdravstvene nege uporabljati tudi znanja s področja medicine, dietetike, psihologije in splošno razgledanost, da lahko izvaja kvalitetno zdravstveno nego. Cilj raziskave je ugotoviti, kako celiakija vpliva na posameznikovo življenje in kakšne prilagoditve so potrebne, da posameznik v čim manjši meri občuti posledice bolezni.

**Metode:** Uporabljena je bila deskriptivna neeksperimentalna kvantitativna metoda empiričnega raziskovanja, za zbiranje podatkov je bila uporabljena metoda anketiranja. Vključenih je bilo 500 članov Slovenskega društva za celiakijo, vrnjenih je bilo 313 vprašalnikov (62,6 %). Rezultati so prikazani z opisno statistiko - frekvencami, odstotki, povprečnimi vrednostmi in standardnimi odkloni. Za statistično obdelavo podatkov so bile uporabljene bivariatne metode: ANOVA, t-test, Pearsonov koeficient ter Hi-kvadrat. Upoštevali smo statistično značilnost na ravni 0,05. Za kvantitativno obdelavo podatkov je bil uporabljen program SPSS verzija 22.0.

**Rezultati:** Do statistično pomembne, pozitivne in šibke povezanosti prihaja z vidika prehranskih prekrškov med starostjo in telesnimi reakcijami ( $r = 0,126$ ,  $p = 0,042$ ) ter starostjo in potrebo po dodatni pomoči pri obvladovanju celiakije ( $r = 0,194$ ,  $p = 0,047$ ). ANOVA test je pokazal statistično značilne razlike med delovnim statusom anketiranih in vključevanjem anketiranih v družbo ( $F = 2,126$ ,  $p = 0,042$ ).

**Razprava in zaključek:** Edini način, da pacienti s celiakijo obvladujejo svojo bolezen, je brezglutenska dieta, zato bi jo moral vsak pacient s celiakijo dosledno izvajati. Ker se diete velikokrat nenamerno ne upošteva, je naloga zdravstvenega sistema, da vzpostavi učinkovito izobraževanje in informiranje ter spremljanje in usmerjanje pacientov. S pridobljenimi kompetencami in naprednimi znanji bi medicinske sestre lahko izvajale celostno zdravstveno vzgojo in svetovanje tako pri pacientih z diagnosticirano celiakijo, ki bi na ta način dolgoročno bolje obvladovali celiakijo, kot pri ostalih posameznikih, ki ta znanja potrebujejo.

**Ključne besede:** celiakija, brezglutenska prehrana, zdravstvena nega, Slovensko društvo za celiakijo

## Celiac disease - patient experiences

*Manca Košelnik, Mateja Bahun*

*Angela Boškin Faculty of Health Care, Spodnji Plavž 3, 4270 Jesenice, Slovenia*

**Introduction:** Celiac disease is a serious autoimmune condition occurring in individuals with genetic predispositions for it in whom gluten ingestion causes damage to the small intestine. In addition to employing their nursing knowledge when treating patients with celiac disease, nurses should also have knowledge in medicine, dietetics, psychology, and broad general knowledge to be able to provide high-quality nursing care. The aim of the study was to determine how celiac disease affects patients' lives and what changes should be adopted to mitigate the consequences of the disease on their lives.

**Methods:** A descriptive non-experimental quantitative method of empirical research was employed. Data were collected with a questionnaire. Questionnaires were administered to 500 members of the Slovenian Celiac Society and 313 questionnaires were returned, making the response rate 62.6 %. The results are presented with descriptive statistics and frequencies, percentages, means and standard deviations. For statistical data processing, bivariate methods were used: ANOVA, t-test, Pearson's coefficient and chi-square. The level of statistical significance was set at  $p = 0.05$ . Quantitative data processing was performed using SPSS software, version 22.0.

**Results:** Statistically significant, positive and weak correlations were found to exist between the age of respondents and physical reactions following the intake of forbidden foods ( $r = 0.126$ ,  $p = 0.042$ ), and the age of respondents and the need for additional help with management of the disease ( $r = 0.194$ ,  $p = 0.047$ ). The ANOVA test revealed significant differences between the working status of respondents and their integration into society ( $F = 2.126$ ,  $p = 0.042$ ).

**Discussion and conclusions:** Since the only way for patients with celiac disease to manage the condition is to adopt a gluten-free diet, patients should strictly follow the diet. Because dieting is often unintentionally ignored, the health system should establish effective training programs and make information on the disease widely available to patients while monitoring and guiding them. With their acquired competencies and advanced knowledge, nurses could carry out comprehensive health education and counseling for both patients with diagnosed celiac disease, helping them to better manage the condition, and other individuals who might require such knowledge.

**Key words:** celiac disease, gluten-free diet, nursing, Slovenian Celiac Society

## Stališča zaposlenih do usklajevanje poklicnega in zasebnega življenja: študija primera

Maja Krajnc

Srednja elektro-računalniška šola Maribor, Smetanova 6, 2000 Maribor, Slovenija

Izhodišča in namen: Stres na delovnem mestu je eden od najpomembnejših dejavnikov počutja in zdravja posameznika. Namen prispevka je izvesti študijo primera zaposlenih v eni izmed delovnih organizacij v Podravju. Analizirali smo usklajevanje poklicnega in družinskega življenja, bolniško odsotnost in predloge ukrepov zaposlenih za zmanjšanje stresa.

Predstavitev vsebine: Stres na delovnem mestu in načini spoprijemanja s stresom imajo velik vpliv na zdravje in na kakovost opravljenega dela zaposlenih, česar se vse bolj zavedajo tudi delodajalci. Ker je v interesu delodajalcev in države, da zaposleni kvalitetno opravljajo delo in da ima čim manjši delež zaposlenih status (dolgotrajnih) bolniških odsotnosti, se sprejemajo različni ukrepi za zagotavljanje ustreznih delovnih pogojev in za opremljanje zaposlenih z učinkovitimi strategijami aktivnega spoprijemanja s stresom na delovnem mestu. Pomembna dejavnika, ki prispevata k zmanjšanju stresa na delovnem mestu in k boljšemu duševnemu in telesnemu zdravju so medsebojni odnosi na delovnem mestu (Argyle, 1992) in uspešno usklajevanje družinskega in poklicnega življenja. Pomembno je tudi zavedanje podjetij, da sta zadovoljstvo in pripadnost zaposlenih ključna za uspešen razvoj podjetja (Hartman in drugi, 2015).

Študija primera: Izvedli smo anketni vprašalnik med 55 zaposlenimi v organizaciji v javnem sektorju. Vzorec je sestavljalo 60 % žensk. 65 % respondentov je bilo starih 51 let ali več. 27 % anketiranih navaja, da imajo težave pri usklajevanju družinskega in poklicnega življenja, razlike med spoloma niso bile zaznane. 32 % anketirancev je odgovorilo, da zaradi časa, ki ga porabijo za službene obveznosti, pogosto ne morejo sodelovati v družinskih aktivnostih, 37 % pa zato, ker se iz službe vrnejo preveč izčrpani. 46 % anketiranih v zadnjih 12-ih mesecih ni koristilo bolniškega dopusta zaradi lastne bolezni, 46 % jih je bilo bolniško odsotnih 1-5 delovnih dni, 8 % pa več kot 20 dni. Pri tem ni bilo razlik med tistimi, ki so dejali, da imajo težave pri usklajevanju družinskega in poklicnega življenja in tistimi, ki tovrstnih težav nimajo. 70 % anketiranih kot pomemben ukrep za zmanjševanje in soočanja s stresom navaja izobraževanja na temo zmanjševanja stresa in učinkovitega usklajevanja družinskega in poklicnega življenja. Aktivnosti za zmanjševanje stresa zaposlenih, ki bi se izvajale v organizaciji (npr. delavnice soočanja s stresom, športne aktivnosti,...) pa kot pomemben ukrep vidi 72 % anketiranih.

Sklepne ugotovitve: Organiziranost delovnega procesa je pomemben dejavnik duševnega in telesnega zdravja zaposlenih. Z zagotavljanjem ne zgolj ustreznih delovnih pogojev, ampak tudi zdravju in počutju prijaznih delovnih organizacij pridobijo vsi: država, delodajalci, zaposleni ter uporabniki storitev delovnih organizacij. Bistvenega pomena za doseg cilja je zato sodelovanje vseh deležnikov, sprotne analize stanja in ustrezno odzivanje na spreminjajoče se družbene pogoje dela.

*Ključne besede:* usklajevanje poklicnega in zasebnega življenja, zdravje, počutje zaposlenih, stres

## Employee attitudes towards work-life balance: A case study

*Maja Krajnc*

*Srednja elektro-računalniška šola Maribor, Smetanova 6, 2000 Maribor, Slovenia*

**Background and Purpose:** Workplace stress is one of the most important determinants for individual's well-being and health. The purpose of our paper is to carry out a case study of employees in one of the work organizations in Podravje region. We analysed work-life balance, sick leave and employee's proposals for workplace stress.

**Content:** It is becoming increasingly realized by employers that work-related stress and coping strategies have a major impact on employees' health and quality of their work. Since it is in the interest of both employers and the state that employees perform high-quality work and that employees do not have a large number of (long-term) sick leaves, various measures have been taken to ensure appropriate work conditions and to equip employees with effective strategies for coping with work stress. Important determinants that contribute to reducing workplace stress and better mental and physical health are workplace relationships (Argyle, 1992) and successful work-life balance. It is also important for companies to be aware that employee satisfaction is key to successful business development (Hartman et al., 2015).

**Case Study:** We conducted a survey of 55 employees in a work organization in the public sector. The sample consisted of 60% of women. 65% of respondents were 51 years of age or older. 27% of respondents indicated that they had difficulties reconciling family and professional life. Interestingly, gender differences were not detected. 32% of respondents said that they often cannot participate in family activities because of the amount of time they spend on work-related responsibilities, and 37% because they return from work feeling too exhausted. In the last 12 months, 46% of respondents did not take a sick leave, 46% were absent for 1-5 working days, and 8% for more than 20 days. There were no differences between those who said that they had difficulty reconciling family and professional life and those who did not face this issue. 70% of the respondents cited education programmes on stress reduction and on effective reconciliation of family and work life as important measures for reducing and coping with stress. 72% of those surveyed saw activities for reduction employee stress carried out within the organization as an important measure (e.g., stress management workshops, sports activities, etc.).

**Conclusion:** The organization of the work process is an important determinant of mental and physical health of employees. Everyone gains when as optimal as possible working conditions are provided, and when employee-friendly work organizations are set up: the state, employers, employees and users of work organizations' services. The cooperation of all stakeholders and the efficient response to the changing social conditions of work are essential for achieving this goal.

**Key words:** work-life balance, health, employee well-being, stress

## Struktura družine, občolske kulturne aktivnosti v OŠ ter zdravje mladih v Sloveniji

Danijela Lahe, Tina Čupar, Andrej Kirbiš

Univerza v Mariboru, Filozofska fakulteta, Koroška cesta 160, 2000 Maribor, Slovenija

Uvod: Ker je zdravje delovno aktivne populacije odraslih tesno povezano z njihovim zdravjem v mladosti, je pomembno preučiti zgodnejše dejavnike njihovega trenutnega zdravja. Raziskave npr. kažejo, da pomembno vlogo pri zdravju in počutju mladostnikov, pa tudi njihovih kasnejših izidih v odraslosti, npr. pri poklicni uspešnosti in dohodku, igra šolski kontekst, vključno z občolskimi kulturnimi, umetniškimi in ustvarjalnimi dejavnostmi (KUD). Ob tem je družina ključno socialno okolje, v katerem poteka razvoj otroka in mladostnika, prav tako pa pomembno prispeva in strukturira njegove občolske KUD aktivnosti. Raziskave npr. kažejo, da struktura družine lahko igra vlogo pri zdravju mladih, relativno nepojasnjen, tudi v Sloveniji, pa v raziskavah ostaja odnos med strukturo družine orientacije in občolskimi KUD aktivnostmi v času odraščanja ter odnos med slednjima in trenutnimi zdravstvenimi izidi mladostnikov. Namen raziskave je bil analizirati 1) ali je struktura družine orientacije dejavnik KUD aktivnosti v času osnovnošolskega izobraževanja; 2) ali je struktura družine dejavnik trenutnega subjektivnega zdravja mladostnikov; 3) ali je udeleževanje v KUD v času posameznikovega OŠ izobraževanja povezano z njihovim trenutnim zdravjem, ob kontroli sociodemografskih spremenljivk.

Metoda: Analizirali smo vzorec mladih iz Slovenije, starih do 34 let (povprečna starost = 19,25 let; 57,5 % žensk), ki smo ga s pomočjo spletne ankete pridobili v decembru 2019 in januarju 2020. Strukturo družine orientacije so predstavljale štiri kategorije (1 = dvostarševska družina z obema biološkima staršema; 2 = enostarševska družina (biološka mati); 3 = enostarševska družina (biološki oče); 4 = reorganizirana družina (vsaj dva skrbnika izmed katerih je vsaj en biološki starš). Prav tako smo merili pogostost udeležbe v petih občolskih KUD na področju glasbe, računalništva, fotografije, gledališča in na drugih področjih KUD (0 do 5 aktivnosti). Zdravje mladostnika smo merili s petstopenjskim kazalnikom samoocenjenega zdravja (1 = slabo; 5 = odlično).

Rezultati: Bivariatna analiza je pokazala statistično značilno ( $p < 0,05$ ) povezanost med vsemi tremi spremenljivkami. Samoocenjeno zdravje in pogostost KUD sta bila najnižja v reorganizirani družini, višja pogostost udeležbe v KUD pa je bila statistično značilno povezana z boljšim trenutnim zdravjem. Rezultati ordinalne regresijske analize so pokazali, da sta ob kontroli spola in starosti reorganizirana družina orientacije in odsotnost kulturnih aktivnosti ostali statistično značilno povezani s slabšim samoocenjenim zdravjem.

Razprava: Naša raziskava je pokazala, da sta družinski in šolski kontekst v času odraščanja povezana z zdravjem mladih v kasnejšem obdobju mladostništva. V Sloveniji bi morali nameniti več pozornosti zagotavljanju enakih možnosti mladostnikom v šoli ter preučiti mehanizme, preko katerih lastnosti družine prispevajo k mladostnikovemu zdravju in dobremu počutju ter njegovemu občolskemu kulturnemu angažmaju.

*Ključne besede:* družina, mladostniki, kulturne aktivnosti, občolske dejavnosti, zdravje



## Family structure, school extracurricular cultural activities and health of Slovenian young people

Danijela Lahe, Tina Cupar, Andrej Kirbiš

University of Maribor, Faculty of Arts, Koroška cesta 160, 2000 Maribor, Slovenia

**Introduction:** Since health of working population is related to health in life period of youth, it is important to study earlier determinants of their current health. Studies show that one of important determinants of health and well-being of young people, as well as their later outcomes in adulthood, such as professional success and income, includes their participation in cultural, artistic and creative activities (CA). Family is also a crucial social environment in which development of a child and adolescent takes place; moreover, family impacts his/her CA activities. For example, research show that family structure can have important role in young people's health. However, the relation between the structure of the family of orientation and extracurricular CA activities during adolescence, and the between the latter and youth's current health outcomes remain relatively unexamined, including in Slovenia. The purpose of this study is to analyse 1) whether family of orientation is a determinant of CA activities during primary school education; 2) whether family structure is a determinant of current subjective health of young people; 3) whether participation in CA activities during adolescence is related to youth's current health, controlling for sociodemographic variables.

**Method:** We analysed a sample of young people in Slovenia up to 34 years old (average age = 19.25 years old; 57.5% females), acquired through an online survey in December 2019 and January 2020. Structure of family of orientation was measured with four categories (1 = two-parent family with both biological parents; 2 = one-parent family (biological mother); 3 = one-parent family (biological father); 4 = reorganised family (at least two carers, one of which is a biological parent). We also measured frequency of participation in five extracurricular CA activities in areas of music, computer/ICT, photography, theatre and other fields of CA (0 to 5 activities). Current health of young people was measured with a 5-point scale of self-rated health (SRH) (1 = poor; 5 = excellent).

**Results:** Bivariate analysis showed statistically significant ( $p < 0.05$ ) correlation between all three variables of interest. Self-rated health and frequency of CA activities were the lowest in reorganised families, higher frequency of CA was statistically significantly related to better SRH. Results of ordinal regression analysis showed that, when controlled for gender and age, reorganised family of orientation and lower frequency of CA remained statistically significantly related to worse SRH.

**Discussion:** Our research showed that family and school contexts during adolescence are related to health of young people in later periods of youth. In Slovenia, a greater focus should be placed on ensuring equal opportunities for adolescents in school environment, and on explaining the mechanisms through which family characteristics contribute to young people's health and to their extracurricular cultural engagement.

**Key words:** family, young people, cultural activities, extracurricular activities, health

## Percepcija varnosti cepiva proti gripi med delovno aktivno in neaktivno populacijo v Sloveniji

Monika Lamot, Andrej Kirbiš

Univerza v Mariboru, Filozofska fakulteta, Koroška cesta 160, 2200 Maribor, Slovenija

**Uvod:** Za gripo v Sloveniji po ocenah vsako leto zboli 5–10 % populacije. Najučinkovitejše jo preprečimo s cepljenjem, s katerim preprečujemo nastanek bolezni, hospitalizacijo in z gripo povezane smrtne izide. Čeprav cepljenje proti gripi velja za varno in učinkovito zaščito pred obolenjem za gripo, je v Sloveniji precepljenost proti gripi ena najnižjih v Evropi, saj je bilo v sezoni 2018/19 cepljenih le 4,5 % populacije. Raziskave kažejo, da je sprejemanje (ali zavračanje) cepiv povezano z različnimi družbenimi dejavniki, vendar so se pretekle študije, ki so proučevale stališča do cepljenja med delovno aktivno populacijo, prvenstveno osredotočale na zdravstvene delavce. V Sloveniji primanjkuje raziskav o stališčih do cepiva proti gripi. Ker so se percepcije varnosti cepiva v preteklih študijah izkazale kot pomemben dejavnik cepljenja proti gripi, je bil namen pričujoče raziskave ugotoviti, ali obstajajo razlike v percepciji varnosti cepiva proti gripi med delovno aktivnimi in delovno neaktivnimi prebivalci Slovenije (zaposlenimi za nedoločen čas, določen čas, samostojnimi podjetniki, brezposelnimi in študenti).

**Metoda:** Analizirali smo vzorec prebivalcev Slovenije ( $n = 661$ ; povprečna starost = 34,9 let; v vzorcu 76,6 % žensk), ki smo ga pridobili s pomočjo spletne ankete izvedene v novembru 2019. Preverjali smo sociodemografske (spol, velikost kraja bivanja) in socioekonomske (aktivnostni status, izobrazba staršev, dohodek, samoocenjeni ekonomski status gospodinjstva) dejavnike percepcije varnosti cepiva proti gripi, ki je bila merjena s postavko »Menim, da je cepivo proti gripi zelo varno« (1 = sploh se ne strinjam; 5 = povsem se strinjam).

**Rezultati:** Ordinalna regresijska analiza je pokazala, da je percepcija cepiva proti gripi kot "bolj varnega" povezana z višjim dohodkom anketirancev in višjim samoocenjenim socioekonomskim statusom gospodinjstva anketirancev. Nadalje se je izkazalo, da moški v primerjavi z ženskami dojemajo cepivo proti gripi kot bolj varno; takšno prepričanje pa velja tudi za anketirance, ki bivajo v mestnih okoljih v primerjavi s tistimi iz podeželja. Izobrazba staršev ni statistično značilen napovedovalec percipirane varnosti cepiva. V primerjavi z zaposlenimi za nedoločen čas samostojni podjetniki in brezposelni percipirajo cepivo proti gripi kot manj varno, medtem ko študenti v primerjavi z zaposlenimi za nedoločen čas dojemajo cepivo kot bolj varno.

**Razprava:** K precepljenosti proti gripi ter k boljšemu zdravju delovno aktivne in neaktivne populacije v Sloveniji bi (z osredotočanjem predvsem na družbene skupine, ki cepivo dojemajo kot manj varno) pozitivno pripomogle promocijske in komunikacijske aktivnosti na državni ravni in v množičnih medijih ter izboljšanje komunikacije med zdravniki in pacienti glede varnosti cepiv proti gripi.

**Ključne besede:** cepljenje proti gripi, delovno aktivno prebivalstvo, zaposlitveni status, javno zdravje, stališča, javno mnenje

## Influenza vaccine safety perception among working and non-working Slovenians

Monika Lamot, Andrej Kirbiš

University of Maribor, Faculty of Arts, Koroška cesta 160, 2200 Maribor, Slovenia

**Introduction:** Seasonal influenza (flu) usually affects 5-10% of Slovenian population. It can be most effectively prevented by vaccination, which reduces the risk of flu illnesses, hospitalization and flu-related deaths. Despite influenza vaccination generally being safe and effective method of protection against flu illnesses, Slovenia has among the lowest flu vaccination coverage in Europe, with only 4.5% of the population being vaccinated in the 2018/9 season. Research indicates that the acceptance (or rejection) of vaccines is related to various social determinants, yet previous studies on attitudes toward vaccination among the working population have largely focused on healthcare professionals. In addition, there is a lack of research on attitudes towards influenza vaccine in Slovenia. As perceptions of vaccine safety were previously found to be a significant determinant of seasonal influenza vaccination uptake, the purpose of our study was to determine whether there are differences in the perception of influenza vaccine safety among working and non-working residents of Slovenia (permanent employees, part-time employees, entrepreneurs, the unemployed and students), controlling for other relevant factors.

**Method:** We analyzed a sample of Slovenians (n = 661; Mage = 34.9 years; 76.6% women), which was obtained through an online survey in November 2019. We examined sociodemographic (gender and size of residential settlement) and socioeconomic (activity status, parental education, income, self-assessed household economic status) determinants of perceived safety of the influenza vaccine, which was measured with the following item: "I think the influenza vaccine is very safe" (1 = strongly disagree; 5 = strongly agree).

**Results:** Ordinal regression analysis indicated that perception of greater influenza vaccine safety was associated with respondents having higher personal income and higher self-assessed household socioeconomic status. In addition, men (more than women) perceived the influenza vaccine to be safe, as did respondents living in urban environments. Parental education was not a significant predictor of perceived vaccine safety. Finally, compared to full-time employees, entrepreneurs and the unemployed had significantly less trust in vaccine safety, while students' perceptions were significantly higher.

**Conclusion:** Promotion and communications activities for flu vaccine safety, especially among groups who perceive it as less safe, may have a positive impact on flu vaccination coverage and on the health of the working and non-working population of Slovenian residents.

**Key words:** influenza vaccination, employment status, working population, public health, attitudes, public opinion

## **Povezanost vadbe dihanja in oceno kakovosti življenja pri odraslih – integrativni pregled literature**

*Eva Lenart, Karin Vrtar, Ana Benedik, Petra Zajc, Sabina Ličen, Milan Hosta, Matej Plevnik*

*Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija*

**Uvod:** Motnja dihanja je pri odraslih pogost pojav, ki se pojavi tudi pri osebah brez medicinsko diagnosticiranih bolezenskih stanj. Najpogosteje gre za hiperventilacijski sindrom, ki je po podatkih prisoten pri 6 % do 10 % odraslih. Dihalna zmogljivost, povezana z uporabo optimalnih dihalnih vzorcev, ima vpliv tudi na zdravje. Razlogi so predvsem izpostavljenost stresnim situacijam in dogodkom ali nezavednim strahovom, ki lahko povzročajo anksioznost, depresijo in stres. Ta stanja so povezana s prekomerno frekvenco in volumnom dihanja, ki običajno vodita v hiperventilacijo. Na psihološki in telesni ravni se tako stanje lahko občuti kot utrujenost, omotica, mravljinčenje, šibkost, glavobol, bolečina v prsih, motnje spanca in podobno. To so znaki, s katerimi lahko opišemo motnje dihanja. Namen naše študije je bil pregledati literaturo o povezanosti vadbe dihanja z izboljšanjem pljučnih funkcij in oceno kakovostjo življenja pri odraslih.

**Metode:** V raziskavi je bil uporabljen integrativni pregled znanstvene literature, do katere smo v aprilu 2020 dostopali preko elektronskih baz PubMed, Google Scholar in Science Direct. Iskalni niz je vključeval naslednje ključne besede in njihove sinonime: dihanje, zmogljivost, odrasli, kakovost življenja, življenjski slog. V vseh bazah podatkov je bilo uporabljeno napredno iskanje z vključenim Bolovim operaterjem AND/IN med dvema ali več ključnimi besedami. Pri tem smo upoštevali vključitvene kriterije, in sicer objava raziskav med 2010 in 2020, populacijo odraslih med 18 in 65 let ter dostopnost do celotnega besedila; kot izključitveni kriterij pa medicinsko diagnosticirano bolezensko stanje.

**Rezultati:** Izmed 52 zadetkov smo prepoznali 7 relevantnih študij. Rezultati nakazujejo povezanost med vadbo dihanja in oceno splošne kakovosti življenja ter oceno kvalitete življenja in izboljšanjem pljučne funkcije, med vadbo dihanja in zmanjšanjem stanja hiperventilacije oziroma hiperventilacijskih napadov, z izboljšanjem pljučne zmogljivosti ter z izboljšanjem telesne komponente ocene kakovosti življenja in zmanjšanjem števila ambulantnih obiskov zdravnika. Rezultati so tudi pokazali, da so dihalne tehnike lahko alternativno sredstvo zdravljenja stresa, anksioznosti, depresije in nekaterih čustvenih težav ter da lahko vadba preponskega dihanja vpliva na pozornost, prisotnost stanj afekta in zmanjšanje nivoja kortizola v krvi.

**Razprava in zaključek:** Rezultati kažejo povezanost med vadbo dihanja ter dejavniki splošne kakovosti življenja ter zdravja pri odraslih brez medicinsko diagnosticiranih bolezenskih stanj. Ugotavljamo pomanjkanje raziskav, ki bi vključevale preučevanje vadbe tehnik dihanja in njihovega vpliva na izboljšanje pljučnih funkcij in oceno kakovosti življenja pri zdravih odraslih brez prisotnih diagnosticiranih bolezenskih stanj. Zaključimo lahko, da je vadba dihanja pri zdravih odraslih povezana z oceno kakovosti življenja in izboljšanjem pljučnih funkcij, kot tudi, da je področje pomanjkljivo raziskano.

**Ključne besede:** dihanje, vadba, življenjski slog, kakovost življenja, dihalna tehnika

## Relationship between breathing exercises and quality of life in adults – a literature review

*Eva Lenart, Karin Vrtar, Ana Benedik, Petra Zajc, Sabina Ličen, Milan Hosta, Matej Plevnik*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** Respiratory disorders are a common occurrence in adults, which also occur in people without medically diagnosed medical conditions. The most common is the hyperventilation syndrome, which is present in 6 % to 10 % of adults. Overall respiratory capacity associated with the use of optimal breathing patterns also has an impact on health. The reasons are mainly exposure to stressful situations or unconscious fears that can cause anxiety, depression and stress. These conditions are associated with excessive frequency and volume of respiration, which usually lead to hyperventilation. On a psychological and physical level, such a condition can express itself as fatigue, dizziness, tingling, weakness, headache, and the like. These are the signs with which we can describe respiratory disorders. The purpose of our study was to review the literature on the association of breathing exercises with improving lung function and assessing the quality of life in adults.

**Methods:** The research used an integrative review of the scientific literature, which was accessed in April 2020 via the electronic databases PubMed, Google Scholar and Science Direct. The search string included the following keywords and their synonyms: respiration, performance, adults, quality of life, lifestyle. All databases used an advanced search with the included Bol operator AND / IN between two or more keywords. We took into account the inclusion criteria, namely the publication of papers between 2010 and 2020, the adult population between 18 and 65 years of age, and the accessibility to the full text; and an exclusion criterion: a medically diagnosed medical condition.

**Results:** Out of 52 items found, 7 relevant studies were identified. The results suggest a connection among breathing exercises, the quality of life and the improvement of lung function, between breathing exercises and the decrease in the number of hyperventilation attacks, the improvement of lung capacity and the improvement of body component of the assessment of the quality of life and the decrease in ambulance visits. The results also showed that breathing techniques can be an alternative treatment for stress, anxiety, depression and some emotional problems, and that diaphragmatic breathing exercises can affect attention, the presence of outburst events and reduce blood cortisol levels.

**Discussion and conclusion:** The results show a connection between breathing exercises and the general quality of life and health factors in adults without medically diagnosed medical conditions. We note a lack of research that would examine the study of breathing techniques and their impact on the improvement of lung function and the assessment of the quality of life in healthy adults without the presence of diagnosed diseases. We can conclude that breathing exercises in healthy adults are associated with the assessment of the quality of life and the improvement of lung function, as well as that the area is poorly researched.

**Key words:** breathing, exercise, lifestyle, quality of life, breathing technique

## Egalitarno distribuirano ohranjanje zdravja s pomočjo tehnologij podaljševanja življenja

*Martin Lipovšek*

*Univerza v Ljubljani, Filozofska Fakulteta, Aškerčeva cesta 2, 1000 Ljubljana, Slovenija*

Izhodišča in namen: Izhodišče našega prispevka je teza, da bi v določenih pogojih morale biti medicinske tehnologije podaljševanja življenja na voljo vsem državljanom preko brezplačnega javnega zdravstva. Namen predlagane teze pa je večplasten. Prvič, s tem da bi nudili podaljševanje življenja, ki ga tu definiramo kot medicinske in farmakološke terapije, ki delujejo proti biološkemu procesu staranja in nekatere od njih lahko pričakujemo že v bližnji prihodnosti, bi ohranjali in krepili zdravje populacije – med drugim tudi delovno aktivne populacije. Ta populacija bi bila zaradi teh intervencij v telo bolj vitalna dlje v starost in bi s tem lahko dlje časa ostajala delovno aktivna. Drugič, podaljševanje življenja je nekaj, kar si prebivalstvo samo večinsko želi – da bi bili zdravi in živeli dlje. To tezo je mogoče trdno podpreti z empiričnimi sociološkimi raziskavami. In tretjič, če bi bilo podaljševanje življenja v določenih pogojih, katerih glavni pogoj je preračunana finančna upravičenost, del javnega zdravstva (in ne le kar si lahko kupijo le bogati), bi s tem zadostili naši ideji socialne pravičnosti, kakor jo lahko dojemamo skozi egalitarne politično-filozofske teorije.

Predstavitev vsebine: Za zgornjo tezo je mogoče predstaviti argumente za in proti. Če se naslonimo na tradicijo liberalne filozofske pozicije, katere predstavnik je John Rawls, lahko branimo pozicijo, ki je bila predstavljena zgoraj. Glavni argument pri tem je aplikacija tančice nevednosti na konkretno vprašanje pravične distribucije medicinskih sredstev. Obstajajo pa tudi argumenti iz nekaterih drugih etičkih in politično-filozofskih tradicij. O pojmu pravičnosti pri podaljševanju življenja je obsežno pisal dr. Adrian Bunn, na katerega se v prispevku tudi sklicujemo.

Sklepne ugotovitve: S pričakovanim prihodom podaljševanja življenja se odpirajo nova vprašanja in izrisujejo nove etiške in politično-filozofske dileme. Eno od teh novih vprašanj je, ali zagotoviti nekatere od teh novih tehnologij vsem državljanom, da se svobodno odločijo zanje, ali ne. Liberalna politično-filozofska tradicija ne le dopušča tovrstne nove tehnologije, temveč v določenih pogojih postavlja etično zahtevo družbi, da so te tehnologije dostopne vsem, ne le bogatim.

*Ključne besede:* javno zdravstvo, podaljševanje življenja, filozofija

## **Egalitarian distribution of health maintenance using technologies for life extension**

*Martin Lipovšek*

*University of Ljubljana, Faculty of Arts, Aškerčeva cesta 2, 1000 Ljubljana, Slovenia*

**Background and purpose:** Background of our paper is the thesis that, under certain conditions, life-extension medical technologies should be available to all citizens through free public health care. The purpose of the proposed thesis is multifaceted. First, by offering life extension, which we define as medical and pharmacological therapies that work against the biological aging process and some of which can be expected in the near future, we would maintain and strengthen the health of the population - including the working population. As a result of these interventions in the body, this population would be more vital in old age and could thus remain active for a longer period of time. Secondly, prolonging life is something that the majority of the population wants - to be healthy and live longer. This thesis can be firmly supported by empirical sociological research. And third, if prolonging life under certain conditions, the main condition of which is recalculated financial eligibility, would be part of public health (and not just what only the rich can buy), it would satisfy our idea of social justice as we can perceive it through egalitarian political-philosophical theories.

**Presentation of the content:** For the above thesis it is possible to present arguments for and against. If we rely on the tradition of the liberal philosophical position represented by John Rawls, we can defend the position presented above. The main argument here is the application of the veil of ignorance to the concrete question of the fair distribution of medical devices. But there are also arguments from some other ethical and political-philosophical traditions. The concept of justice in prolonging life has been extensively written about by dr. Adrian Bunn, to whom we also refer in the article.

**Conclusions:** With the expected arrival of life extension, new questions open up and new ethical and political-philosophical dilemmas emerge. One of these new questions is whether or not to provide some of these new technologies to all citizens to choose freely. The liberal political-philosophical tradition not only allows such new technologies, but under certain conditions places an ethical requirement on society that these technologies are accessible to all, not just to the rich.

**Key words:** public health, life extension, philosophy

## Zaposlovanje starejših deluje v prid raznolikosti in kakovosti družbe

Marjeta Logar Čuček

Univerzitetni klinični center Ljubljana, Zaloška cesta 2, 1000 Ljubljana, Slovenija

Uvod: »Nova resničnost« v svetu in doma ne deluje v prid podaljševanju zaposlovanja starejših. Ta čas je starejše, delovno aktivne, stlačil v »predal« rizičnih skupin, navidezne skrbi za njihovo zdravje. Svet zahteva aktivno vlogo vsakega posameznika v družbi; razumevanje dogodkov in okolja bo vedno vodilo k upoštevanju strokovnega znanja, delovnih izkušenj, kritične misli, zmožnosti presoje starejših zaposlenih. Zaupati jim je treba aktivno vlogo, a ne pod pogoji, ki ljudi žene v absentizem, izostajanje z delovnega mesta brez medicinskih vzrokov ali prezentizem, prisotnost za vsako ceno. Namen študije je ugotoviti, v kolikšni meri se v slovenskem prostoru raziskujeta omenjena pojava na ravni podiplomskega študija na zdravstvenih fakultetah, fakulteti za vede o zdravju oz. visokih šolah za zdravstveno nego, in sicer v soodvisnosti različnih dejavnikov tveganja v delovnih okoljih in sočasni skrbi za podaljševanje delovne vpetosti starejših zaposlenih v organizaciji oziroma podjetju.

Metode: Uporabljen je bil pregled magistrskih del in doktorskih disertacij z izbranih fakultet, objavljenih na spletu od 2015 do 2020, izveden s pomočjo protokola PRISMA. Identificirani zadetki so bili opisani, analizirani ter evalvirani.

Rezultati: Pojav absentizma raziskujejo na različnih smereh izobraževanja podiplomskega študija, tudi zdravstveni; prezentizma, prepoznane v novem času, se ne raziskuje v obsegu, ki bi dal temeljitejši uvid v reševanje nakazane težave. Zaposlovanje starejših je predstavljeno v smislu ohranjanja fizične sposobnosti, delno premagovanja stresa; vplivi drugih psihosocialnih dejavnikov so premalo raziskani glede na kompleksnost problematike.

Razprava in zaključek: Absentizem in prezentizem sta velikokrat posledica strahu pred »nemogočim« oz. pred »izgubo«. Sprememba družbe je pogojena s spreminjanjem lestvice posameznikovih vrednot. Te se počasi, a z vso vztrajnostjo ukoreninijo v vseh sferah družbe, a ne brez pomoči razvoja in znanosti. Raziskovanje o posledicah staranja in dolgoživosti družbe in pomenu zaposlovanja starejših še ni pomembneje doseglo širšega raziskovanja na akademski ravni in posledično spreminjanja in udejanjana ugotovitev v realnosti, v smeri boljšega. Napredek, ki je že dosežen v prid enakovredne obravnave starejših pri zaposlovanju, lahko vsaka sprememba na globalni in lokalni ravni izniči, pogosto tudi prikrito.

*Ključne besede:* delovna aktivnost, delovni pogoji, preobremenjenost, prezentizem, absentizem



## Hiring older people as a way to increase diversity and improve the quality of society

*Marjeta Logar Čuček*

*University Medical Centre Ljubljana, Zaloška cesta 2, 1000 Ljubljana, Slovenia*

**Introduction:** The co-called »new reality«, as observed both in Slovenia and abroad, does not favour the employment of older population. Older people, who are still active, are labelled as high-risk groups that need special health care. The society expects an active participation of every individual— being knowledgeable about the world, understanding the events and environment leads us to value expertise, work experience and critical reasoning of older employees. They need to be given an active role, but not under conditions that drive a worker into absenteeism, failing to appear at work, even without health reasons, or presenteeism, being present at work at all costs. The purpose of this study is to find out to what extent the two phenomena have been researched at the post-graduate level at medical faculties, faculty of health sciences or health care faculties in Slovenia, considering various risk factors present at work and maintaining effort to extend the years of service of older employees.

**Methods:** Master's and Doctoral theses from chosen faculties, published online between 2015 and 2020, have been studied by using the PRISM protocol. The identified hits have been described, analysed and evaluated.

**Results:** Absenteeism has been researched in different postgraduate study programmes, including health studies, whereas presenteeism, which is increasingly observed in current time, has so far not been dealt with in the scope that would provide a more through insight into finding solutions. The employment of older population is presented in the sense of maintaining their physical fitness, partially also as a stress-coping mechanism. The influences of other psychosocial factors still remain insufficiently explored, considering the complexity of the issue.

**Discussion and conclusion:** Both absenteeism and presenteeism are frequently the result of a fear of the »impossible« or »loss«. The changes in society are more often than not dependent on the changes in an individual's value system. New values slowly but surely take root in all pores of society; the process is greatly accelerated by development and science. The research into the consequences of aging society and longevity and the growing importance of employment of older population has so far not been widely conducted on the academic level and, consequently, changes and improvements have not been implemented in real life yet. The improvements that have already been achieved in the field of equal treatment of older people in employment can be cancelled out, sometimes very subtly, by a change on the global, or even local level.

**Key words:** employment, working conditions, excessive workload, presenteeism, absenteeism

## Zdravje in počutje medicinskih sester v slovenskih bolnišnicah

Mateja Lorber<sup>1</sup>, Sonja Treven<sup>2</sup>, Damijan Mumel<sup>2</sup>

<sup>1</sup> Univerza v Mariboru, Fakulteta za zdravstvene vede, Žitna ulica 15, 2000 Maribor, Slovenija

<sup>2</sup> Univerza v Mariboru, Ekonomsko-poslovna fakulteta, Razlagova 14, 2000 Maribor, Slovenija

**Uvod:** Zdravstvena nega predstavlja čustveno in fizično naporno delo. Kronični delovni stres in izgorelost v zdravstveni negi sta povezani s počutjem in zdravjem medicinskih sester. Nižja stopnja dobrega počutja je povezana z zdravjem, le-to pa z absentizmom v zdravstveni negi. Cilj raziskave je bil preučiti raven počutja in zdravja medicinskih sester ter ugotoviti dejavnike na delovnem mestu, ki vplivajo na počutje in zdravje medicinskih sester.

**Metode:** Uporabljena je bila kvantitativna metodologija raziskovanja, in sicer presečna študija. V raziskavi so sodelovale medicinske sestre iz osmih bolnišnic v Sloveniji. Uporabljen je bil strukturiran vprašalnik, kjer so se trditve nanašale na psihološko dobro počutje (Psychological Well-being Scale), splošno zdravje (GHQ12), stil vodenja (Multifactorial Leadership Questionnaire), kompetence vodij, ter pogostost in obvladovanje stresa na delovnem mestu. Razmerja med spremenljivkami so bile analizirane s korelacijsko in linearno regresijsko analizo.

**Rezultati:** 85 % medicinskih sester ima dobro zdravje, 26 % pa eno ali več kroničnih bolezni. V povprečju se medicinske sestre na delovnem mestu dobro počutijo ( $17,9 \pm 8,2$  od 30). Rezultati so pokazali, da lahko 41 % zdravja medicinskih sester in 65 % dobrega počutja medicinskih sester napovemo z vedenjem vodij. Ugotovljene so bile statistično pomembne razlike v počutju medicinskih sester glede na leta zaposlitve v zdravstveni negi ( $F = 2.364$ ;  $p = <0.001$ ), pogostost stresa na delovnem mestu ( $F = 47.504$ ;  $p <0.001$ ) in obvladovanje stresa na delovnem mestu ( $Z = 7.798$ ,  $p <0,001$ ). Ugotovljene so bile tudi statistično pomembne razlike v zdravju medicinskih sester glede na stopnjo izobrazbe ( $F = 1.994$ ;  $p = 0.002$ ), leta zaposlitve v zdravstveni negi ( $F = 1.576$ ;  $p = 0.031$ ), pogostost stresa na delovnem mestu ( $F = 8.727$ ;  $p <0,001$ ) in obvladovanje stresa na delovnem mestu ( $F = 1.610$ ,  $p = 0.025$ ).

**Razprava in zaključki:** Povprečne ocene so pokazale, da imajo slovenske medicinske sestre dobro zdravstveno stanje, prav tako se večina medicinskih sester na delovnem mestu počuti dobro. Razlike v počutju in zdravju medicinskih sester glede na delovni položaj je mogoče razložiti z različnimi stopnjami samostojnosti, dolžnosti in postopkom odločanja. Boljše sodelovanje in posvetovanje med vodji in ostalimi medicinskimi sestrami je osnova za doseganje boljšega počutja, boljšega zdravja in večjega zadovoljstva z delom medicinskih sester.

**Ključne besede:** zdravstvena nega, zdravstvo, počutje, management

## Nurses' well-being and health in Slovenian hospitals

Mateja Lorber<sup>1</sup>, Sonja Treven<sup>2</sup>, Damijan Mumel<sup>2</sup>

<sup>1</sup> University of Maribor, Faculty of Health Sciences, Žitna ulica 15, 2000 Maribor, Slovenia

<sup>2</sup> University of Maribor, Faculty of Economics and Business, Razlagova 14, 2000 Maribor, Slovenia

**Introduction:** Nursing is an emotional and physical strenuous job. Chronic work stress and burnout in nursing are related to well-being and health. Lower level of well-being related to health and associated nursing absenteeism and presentism. The aim of the study was to examine the level of nurses' well-being and health, and to find workplace factors that effect on nurses' well-being and health.

**Methods:** Quantitative research based on a cross-sectional study was used. Nurses from eight Slovenian hospitals participated in the study. A structured survey questionnaire was used, included items about psychological well-being (Psychological Well-being Scale), general health (GHQ12), leadership style (Multifactorial Leadership Questionnaire), leaders' competencies, frequency of stress and stress management at the workplace. The relationship between variables was analysed with correlation and linear regression analysis.

**Results:** 85% of nurses have good health, but 26% have one or more chronic disease. On average nurses well-being is positive ( $17.9 \pm 8.2$  from 30). The results revealed that 41% of nurses' health and 65% of nurses' well-being could be statistically predicted by leaders' behavior. It was found statistically significant differences in nurses' well-being according to working years in nursing ( $F=2.364$ ;  $p<0.001$ ), frequency of stress ( $F=47.504$ ;  $p<0.001$ ) and managing stress ( $Z=7.798$ ,  $p<0.001$ ). It was also found statistically significant differences in nurses' health according to the level of education ( $F=1.994$ ;  $p=0.002$ ), working years in nursing ( $F=1.576$ ;  $p=0.031$ ), frequency of stress ( $F=8.727$ ;  $p<0.001$ ) and managing stress ( $F=1.610$ ,  $p=0.025$ ).

**Discussion and conclusions:** Mean scores demonstrated that Slovenian nurses had high level of health, and also their well-being is positive. Differences in nurses' well-being and nurses' health according to the working position can be explained with varying degrees of autonomy, duties, and decision-making process. Better collaboration and consultation between leaders and other nurses is the basis to achieve higher level of well-being, better health and higher level of job satisfaction of nurses.

**Key words:** nursing, health, well-being, management

## Uporabnost Moiré topografije za oceno sprememb drže na delovnem mestu

Sandra Martinuč, David Ravnik

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Izhodišča in namen: Moiré topografija (senčenje) je neinvazivni pristop, ki se že nekaj desetletij uporablja za oceno drže, predvsem pri otrocih za pregled skolioz. Pri zaposlenih odraslih je v literaturi njena uporabnost manj raziskana. Namen prispevka je s pomočjo literature izpostaviti uporabnost in glavne značilnosti pojava Moiré topografske metode za klinične aplikacije, zlasti tiste, povezane s posturalnimi odstopanji med delovno aktivno populacijo, in sicer vse od prvega dne uporabe do sedanjosti.

Predstavitev vsebine: Pri Moiré topografiji opazujemo in vrednotimo konturne linije (sence) na telesu, ki so posledica projekcije točkovnega svetlobnega vihra skozi mrežo, ki se nahaja med človekom in virom. Tehnika omogoča dobro prostorsko oceno simetrije opazovanega (desno-levo) in je uporabna predvsem pri oceni drž v frontalni ravnini (npr. skolioza), ter tudi sagitalni in transverzalni ravnini. Ker je tehnika neinvazivna in dobro korelira z rentgenskimi slikami, in mobilna, jo je možno uporabiti tudi na terenu, torej lahko tudi v delovnem okolju. Literatura navaja sicer največjo uporabnost pri otrocih, se pa lahko uporablja tudi pri ocenah drže, pri ocenah nepravilnosti nog, hrbtenice in lopatic, oceno vpliva športa na morfologijo trupa, prepoznavo deformacij hrbtenice in trupa pri starejših itd. Največ literature je na področju ocene otrok, malo pri starostnikih in zelo malo pri delovno aktivni populaciji.

Sklepne ugotovitve: Od leta 1966 do danes, kar je Moiré topografija v uporabi, se izkazuje izboljšanje izvedbe in natančnosti ter občutljivosti metode. Danes je Moiré topografija že tako razvita, da se jo lahko uporablja s pomočjo prenosne aplikacije za delo na terenu. Za nas se zdi zelo uporabna tudi za okolje dela - na delovnem mestu. S pomočjo ugotovljenih rezultatov lahko pri posamezniku preventivno ali kurativno vplivamo na motnje drže, ki so predvsem v frontalni ravnini oziroma se v njej odražajo.

*Ključne besede:* Moiré topografija, aktivna populacija, delovno mesto

## The applicability of Moiré topography to assess changes in posture in the workplace

*Sandra Martinuč, David Ravnik*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

Starting points and purpose: Moiré topography (shading) is a non-invasive approach that has been used for decades to assess posture, especially in children for scoliosis screening. In employed adults, its applicability is less researched in the literature. The purpose of this paper is to use the literature to highlight the applicability and main features of the Moiré topographic method for clinical applications, especially those associated with postural deviations among the working active population, from the first day of use to the present.

Content presentation: In Moiré topography, we observe and evaluate contour lines (shadows) on the body that result from the projection of a point light source through a grid located between a human and a source. The technique allows a good spatial assessment of the symmetry of the observed (right-left) and is useful especially in the assessment of postures in the frontal plane (eg scoliosis), as well as the sagittal and transverse planes. Because the technique is non-invasive and correlates well with X-ray images, and mobile, it can also be used in the field, so it can also be used in the work environment. The literature states that it is most useful in children, but it can also be used in posture assessments, assessments of leg, spine and shoulder irregularities, assessment of the impact of sport on torso morphology, recognition of spinal and torso deformities in the elderly, etc. Most of the literature is in the field of child assessment, little in the elderly and very little in the working population.

Conclusions: From 1966 to the present, which Moiré topography has been in use, there has been an improvement in the performance and accuracy and sensitivity of the method. Nowadays, the Moiré topography is already so developed that it can be used with the help of a portable field work application. For us, it also seems very useful for the work environment - in the workplace. With the help of the established results, we can preventively or curatively influence posture disorders in an individual, which are mainly in the frontal plane or are reflected in it.

**Key words:** Moiré topography, active population, workplace

## Staranje na odmaknjenih področjih alpskega sveta in zadrževanje delovne sile – mnenje deležnikov

*Andreja Mezinec, Monika Robnik, Ria Jagodic, Luka Kronegger,  
Mojca Gabrijelčič Blenkuš*

*Nacionalni inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija*

**Namen:** V svetu se dogajajo velike demografske spremembe, zaradi katerih se bo delež starejših delavcev v Evropski uniji v naslednjih desetletjih povečal. Slednje predstavlja velik družbeni izziv, ki zahteva skupno sodelovanje različnih deležnikov. Aktivno in zdravo staranje (AZS) je večdimenzionalni koncept, ki zahteva združena in usklajena prizadevanja deležnikov, zlasti na pretežno podeželskih in oddaljenih območjih, kot je na primer alpski svet (AS). S projektom Mednarodno upravljanje aktivnega in zdravega staranja v AS (ASTAHG) posegamo tudi v ta izziv.

**Predstavitev vsebine:** Nacionalni inštitut za javno zdravje je opravil raziskavo v okviru ASTAHG projekta za katero je razvil spletno anketo, ki je bila prilagojena deležnikom AS. Predhodno identificirani deležniki iz določenih občin gorenjske in goriške statistične regije so bili prvi, ki smo jih povabili k sodelovanju v raziskavi. Slednja je vključevala demografski opis deležnikov, z informacijami o njihovem prebivališču, organizacijskem statusu v skladu z „blaginjskim trikotnikom“ in vključenosti v področja, povezana z AZS. Posebno vprašanje smo namenili spodbujanju potreb za privabljanje in ohranjanje delovne sile na odmaknjenih področjih. Vprašanje je bilo razdeljeno na dva dela. V prvem delu smo jih spraševali, katera od ponujenih dejavnosti bi po njihovem mnenju najbolj pripomogla k ohranjanju delovnih mest za mlade. V drugem delu pa nas je zanimalo, katere dejavnosti, ki smo jih v anketi našli, njihova organizacija v lokalnem okolju že izvaja. Med dejavniki, za katere so anketiranci menili, da bi bili najbolj obetavni pri ohranjanju delovnih mest, so izstopali naslednji izzivi: ustrezno stanovanje, zadovoljiva infrastruktura, oskrba starejših ljudi in organizacija prevoza ter dobre prometne povezave. Poleg tega anketiranci menijo, da se organizirana, raznolika in cenovno ugodna ponudba športnih in kulturnih dejavnosti za mlade in družine znotraj lokalnih skupnosti in programov za krepitev zdravja do neke mere že izvaja. Vendar pa obstaja prostor za izboljšave v vsaki ponujeni dejavnosti.

**Sklepne ugotovitve:** Demografske spremembe, še posebej staranje prebivalstva in urbanizacija, niso ugodne niti za podeželja AS. Mladi se vse pogosteje selijo iz podeželskih območij v urbana, počte, banke se zapirajo... Posledično stopnja zaposlenosti na podeželju upada. Današnji tehnološki napredek omogoča prilagoditev delovnih mest kot eno od možnosti ohranjanja delovne sile na odmaknjenih območjih. Pri deležnikih smo želeli zlasti preveriti katere dejavnosti bi lahko prispevale k privabljanju mlajše delovne sile v odmaknjena območja. Prav tako k dvigu zaposlovanja in zadrževanju delovne sile vplivajo tudi intervencije na področju promocije in krepitev zdravja, kar želimo raziskati v prihodnosti. Cilj pristopa ASTAHG je sodelovanje med deležniki na vseh ravneh in sicer na delu uspešnih politik AZS ter pridobivanja sinergij z sodelovanjem na vseh stopnjah političnega cikla.

**Ključne besede:** Aktivno in zdravo staranje, odmaknjena področja, zadrževanje delovne sile

## Ageing in the remote area of Alpine Spaces and retention of workforce – stakeholders opinion

*Andreja Mezinec, Monika Robnik, Ria Jagodic, Luka Kronegger,  
Mojca Gabrijelčič Blenkuš*

*National Institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia*

**Objective:** The world is experiencing a demographic shift and consequently it is foreseen that proportion of older workers in the European Union will increase during the next few decades. Demographic change constitutes a major societal challenge that requires combined efforts from various stakeholders. Active and healthy ageing (AHA) is a multidimensional concept that requires combined and coordinated efforts between stakeholders, particularly in mostly rural and remote areas such as in the Alpine Space (AS). The Alpine Space Transnational Governance of Active and Healthy Ageing (ASTAHG) project aims to tackle this challenge.

**Presentation of the content:** NIJZ distributed a nationally developed online survey which was further adapted for the purposes of ASTAHG to stakeholders. Stakeholders from the selected municipalities of Gorenjska and Goriška statistical regions were initially invited to participate in the survey. The survey entailed a demographic description of stakeholders who participated in the survey, with information on their regional residence, their organizational status according to the “welfare triangle mix” and their involvement in topics connected to AHA. One specific topic we want to present deeper relays on incentives needed to attract and retain the workforce. The specific question was divided into two track: 1) Which of the following activities, in your opinion, would most contribute to conservation of jobs for young people in remote areas? and 2) According to your organization, indicate which of the following activities are already implemented in your place?

Among the factors that respondents believe would be most promising in maintaining jobs for people are the issues of adequate housing, infrastructure, care of older people and transportation with good transport links. Further, they think that organized, varied and affordable offer of sports and cultural activities for young people and families within local communities and health promotion programs are implemented to some extent. However, there is space for improvement in every offered activity.

**Conclusion:** Demographic changes especially population ageing and urbanization, are not favorable neither for rural areas of AS. Young people are increasingly moving from rural areas to urban areas, services as post offices and banks are closing. Consequently employment rates in rural areas is decreasing. Today’s technological advances enable modified jobs as one of the possibilities of keeping the workforce in remote areas. What activities could contribute to attracting younger workforce to remote areas was a challenge we wanted to receive from our stakeholders. Further, retention of workforce is influenced by interventions in the field of health promotion, which we wish to explore in the future. ASTAHG approach aims at cooperation between stakeholders on all levels to work with successful AHA policies and to harvest synergies through cooperation along all stages of the policy cycle.

**Key words:** Active and healthy ageing, rural areas, retention of workforce

## Ergonomska ocena obremenitev na izbranih delovnih mestih v livarni

David Mlakar

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Nastanek mišično-skeletnih okvar se pogosto povezuje s težkim fizičnim delom in rokovanjem s produkti proizvodnje. V sodobnem času je odsotnost z dela zaradi zdravstvenih težav pogosta in predstavlja tudi finančno breme podjetij ter družbe nasploh. Zaskrbljujoče posledice dela, ki se pogosto izražajo predvsem pri starejših zaposlenih, so izhodišče problema.

Metode: Preiskovali smo primera delovnih mest v livarni, na katerih delavci opravljajo ročno in težko fizično delo. Opazovali smo dve vrsti dela, ki sta se razlikovali po značilnostih gibanja in masi zunanega bremena. Delo brusilcev je bilo stoječe, s spremembo položaja na 1 do 2 minuti, med katerim so rokovali z 9 kilogramskim odlitkom. Delo na kontroli kakovosti 1,2 kilogramskih odlitkov je potekalo sede, v intervalih po 5 minut, med katerimi je delavec na računalniškem monitorju opazoval notranjost odlitkov s posnetka pregledovalne sonde. Prvi korak v raziskovanju je bil zajemanje videoposnetkov delovnih ciklov. Sledila je analiza posnetkov po ocenjevalnih metodah OWAS (ang. ovako working posture analysis system) in RULA (ang. rapid upper limb assessment). Na podlagi primerjave rezultatov po obeh metodah smo pri vrednotenju drže in stopnje obremenjenosti upoštevali tudi počutje delavcev. Subjektivno ocenno zaznavanja obremenitev med delom smo pridobili s pomočjo vprašalnika.

Rezultat: Rezultati po ocenjevalni metodi OWAS so nujnost ukrepanja umeščali na drugi nivo od štirih. Ocene po metodi RULA so opozarjale na večjo nevarnost krajših intervalov položajev znotraj delovnega cikla. Določeni intervali, med katerimi delavci pobirajo odlitke, po kriteriju metode potrebuje takojšnjo spremembo delovnih pogojev. Ugotovili smo da brusilci največ časa delajo stoje s trupom upognjenim naprej, skupina kontrole odlitkov pa je najdlje izpostavljena sključeni drži v sedečem položaju. Med najbolj izpostavljenimi segmenti so hrbet, vrat in zapestja.

Razprava: Ugotovitve nakazujejo stopnjo tveganja dejavnikov okolja, ki zahteva hitro ukrepanje. Predlagamo prostorsko prerazporeditev elementov postaj za izboljšanje učinkovitosti in varnosti pri delu tako kontrole kot brusilcev. Ključna prilagoditev za razbremenitev hrbta delavcev se nanaša na prilagodljivost delovne višine. Brusilcem bi to omogočala kombinacija zabojnikov z dvo-sekcijsko stranico in dvižnega sistema le the. Za delovno mesto kontrole pa nastavljava delovna miza za sedeče ali stoječe delo. Splošne prilagoditve se nanašajo še na izboljšavo varnosti in udobja z zamenjavo dotrajanih lesenih talnih oblog, zamenjavo zaščitne opreme in vzpostavitev boljše komunikacije med delavci in vodstvom podjetja. Celovitost ergonomskega programa dodata še predloga aktivnega odmora med delovnim časom in izobraževanje o pomenu ergonomije na delu. Predlogi izboljšav so izbrani na podlagi študij in primerov dobre prakse, ki so obrodili sadove. Učinkovitost intervencije bi bilo potrebno preveriti še po uvedbi ukrepov.

*Ključne besede:* ergonomija, mišično-skeletne okvare, rokovanje z materiali, obremenitve, prilagoditve



## Ergonomic assessment and load management interventions for selected workplaces in a steel factory

David Mlakar

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Musculo-skeletal disorders are often recognised as consequences of hard physical labour and manual material handling. Even in modern times, absence from work is not a rare occurrence. It also draws along numerous financial expenses, which represents a burden to employers, companies and society. The aim of our work was to tailor a working environment, suited for workers in a steel industry using ergonomic assessment tools.

**Methods:** Ergonomic evaluation was applied to two types of workstations, of which dynamics of motion and external load varied. On the grinding station grinding of metal casts was performed. Workers mainly carried out their work in standing position, in intervals of 1 to 2 minutes, while handling 10 to 15 casts, weighting 9 kilograms. On the second workstation, inspection of 1,2 kilogram casts was performed by observing the interior structure on a monitor screen. Workers mainly assumed sitting position in intervals of 5 minutes. Research started with filming work cycles we previously determined by observing the process. Later, evaluation of posture quality was applied using OWAS and RULA assessment tools. After comparing results we also took workers' perceived level of strain in consideration. Information was gathered through a five stage questionnaire.

**Results:** Results acquired by OWAS indicated the most exposed segments of workers were back and legs. Allusions were found that accumulation of time spent in a bending back position and time spent sitting during work could be problematic, but final interpretation only suggested the urgency of implementing interventions is low. When adding RULA evaluation to the picture we found that in certain subcycles during work, both groups were exposed to very uncomfortable positions of lower back, wrists and neck.

**Discussion and conclusions:** Our research showed a dangerous level of load exposure on both workstations. When combining results of all three evaluation tools, we found indications that a quick intervention in the working environment is necessary. Key component of workstation adaptation is to enable adjustable work height. With grinders we suggest a combination of two-section containers and a simple lifting system. A sit-stand working bench is suggested at workstations where inspection of casts is done. General interventions include replacement of worn down wooden standing pads with ergonomic rubber pads, replacement of protective gear and ensuring a better communication between workers and management. By looking into past research of interventions, which proved effective, we designed an ergonomic intervention program that suggests improvements in the field of working environment design, tools and protective equipment, but also trains workers through daily exercise and education plan for an increase in safety and health preservation. To determine the effectiveness of the program, a reassessment after its implementation would be needed.

**Key words:** ergonomics, musculo-skeletal disorders, manual material handling, workload, interventions

## Poškodbe z ostrimi predmeti med zdravstvenimi delavci: Kako ravnati?

*Helena Olenik, Damir Hećimović*

*Univerza v Ljubljani Zdravstvena Fakulteta, Zdravstvena pot 5, 1000 Ljubljana, Slovenija*

**Uvod:** Incident je poškodba z okuženim ostrim predmetom ali razlitje krvi ali telesnih tekočin na poškodovano ali normalno kožo ali sluznico. Nezgod je tudi razlitje krvi po veliki površini normalne kože ali sluznice.

**Metode:** Uporabljena je bila deskriptivna metoda dela s pregledom obstoječe literature. Obdelava podatkov je bila izvedena z uporabo metaanalize podatkov. Zbiranje razpoložljive literature in virov je zajemalo leto 2010 do marca 2020 in sicer v podatkovnih bazah: CINAHL, Medline in COBIB.SI.

**Rezultati:** Zaposleni v zdravstvu se pri svojem delu srečujejo s pacienti, ki imajo različna obolenja. Posebno pozornost je potrebno posvetiti boleznim, krvno prenosljivim boleznim, še poseben poudarek je na virusu hepatitisa B in C ter HIV. Če pride do neželenega vboda z iglo, je potrebno postopati po protokolu. V takem primeru je nujno odvzeti kri tako poškodovanemu zdravstvenemu delavcu ter bolniku. Varno in pravilno ravnanje z ostrimi predmeti zdravstvenim delavcem preprečuje ter zmanjšuje možnost za poškodbo z ostrim predmetom in tako tudi možnost same okužbe. V prispevku bomo uporabili 24 člankov oziroma razpoložljive literature, ki zajemajo podano tematiko kako ravnati v primeru poškodb z ostrim predmetom. **Razprava in zaključek:** Incidenti oziroma vbodi so pri zdravstvenih delavcih vsakodnevna težava. Zdravstveni delavci so dnevno izpostavljeni vbodom z okuženim ostrim predmetom ter posledično še boleznim, kot so hepatitis B in C ter HIV. Vsak zdravstveni delavci lahko za svojo zaščito največ naredi sam. Letno vključevanje v izobraževanja o ravnanju z okuženimi ostrimi predmeti, strokovnost in zbranost na delovnem mestu lahko pripomore k manjšemu številu incidentov.

**Ključne besede:** incident, zdravstveni delavci, okužba, varnost, delovno mesto

## **Injuries from sharp objects between health professionals: How to deal with it?**

*Helena Olenik, Damir Hećimović*

*University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5, 1000  
Ljubljana, Slovenia*

**Introduction:** An incident is the injury with a sharp and infected object or it can be the spillage of blood or body fluids on damaged skin or mucous membranes. Accident or an incident it can also mean a spillage of blood over a large area of normal skin or mucous membranes.

**Methods** A descriptive method was used, namely literature review. The collection of available literature and resources was from 2010 through March 2020 in databases: CINAHL, Medline and COBIB.SI.

**Results:** Employed in health care have to deal with patients with different diseases. Special attention should be paid to blood borne diseases, a special emphasis is placed on the hepatitis B and C and HIV. When it comes to unwanted needle stick or incident, it is necessary to proceed according to the protocol. In this case, it is necessary to take blood for testing both health professional person and the patient. The safe and proper handling of sharp objects is the key to prevent and reduce the possibility of injury from a sharp object and thus the possibility of the infection. In the paper we are using 24 articles who covered disposal to support the topic of how to deal with a sharp object.

**Discussion and conclusion:** Incidents are the health workers everyday problems. Health care workers are daily exposed to a puncture of the infected sharp object, and consequently are exposed to diseases, such as hepatitis B and C and HIV. Every healthcare professional can do the most for their own protection. Annual involvement in education on the management of contaminated sharp objects, expertise and concentrating on the job can help reduce the number of incidents.

**Key words:** incident, healthcare professionals, infection, safety, workplace

## Kako lahko okolje vrtca prispeva k zdravju staršev?

Tanja Plevnik Peternelj

Izhodišča in namen: V prispevku želimo predstaviti dobre prakse in možnosti, s katerimi lahko strokovni delavci v vrtcu in okolje vrtca vplivamo na zdravje staršev, kot delovno aktivne skupine. V praksi opažamo, da na vzorce vedenja otrok, tudi pri skrbi za z zdravjem povezanim vedenjem, pomembno vplivajo vzorci njihovih staršev, zato je izredno smiselno vsaj posredno vplivati tudi na zdravje njihovih staršev. V vrtce je bilo po podatkih SURS za šolsko leto 2018/19 vključeno 87.187 otrok, kar pomeni, da je v vrtčevsko okolje preko svojih otrok dnevno vpeto najmanj 10% odrasle delovno aktivne populacije (staršev) (ob podatku SURS, da je v juniju 2019 bilo v Sloveniji 897.213 delovno aktivnih posameznikov). Eden od ciljev predšolske vzgoje v vrtcih je (Zakon o vrtcih) razvijanje samostojnosti pri higienskih navadah in skrbi za zdravje.

Predstavitev vsebine: V vrtčevskem okolju poleg rednega programa izvajamo številne preventivne in izobraževalne akcije, ki vplivajo na vzgojo in vzorce obnašanja otrok. Tudi vzgojni cilji, ob podpori nacionalnih zdravstvenih organizacij (npr. NIJZ), usmerjajo in podpirajo ozaveščanje z zdravjem povezanega vedenja. Ena od velikih priložnosti, ki se je lahko strokovni delavci v vrtcu poslužujemo je tudi ozaveščanje staršev o pomembnosti skrbi za lastno zdravje in dobro počutje, s tem posredno vplivamo tudi na vzgled, ki ga posredujejo otrokom. Nekaj takih primerov spodbujanja zdravih vzorcev obnašanja je: skrb za higieno (redno umivanje rok pred in po obrokih, po uporabi stranišča; kašljanje v rokav, ...), skrb za redno gibalno aktivnost (spodbujanje vsakodnevnega gibanja na prostem, organizacija različnih akcij, npr. Medgeneracijsko sodelovanje, Aktivni dan ...), ozaveščanje o nacionalnih preventivnih programih in akcijah (Svetovni dan umivanja rok »Čiste roke za vse«, Zdrav dnevni ritem, Teden mobilnosti), skrb za dobro počutje in kakovostne medsebojne odnose (Šola za starše, predavanja za starše na različne teme, npr. Osamosvajanje otrok in staršev, Zdrava navezanost in druge).

Sklepne ugotovitve: Zdravje je večplasten proces skrbi za telesno, duševno in socialno blagostanje in dobro počutje. Kljub pričakovanjem, da odrasli skrbimo za lastno zdravje, vzgojitelji v vrtcu pogosto opažamo, da so pogosto v teh prizadevanjih potrebne tudi vzpodbude staršem kot predstavnikom delovno aktivne populacije. Vzpodbude se največkrat posredujejo preko otrok, skupnih srečanj, občasnih akcij vrtca (npr. skrb za redno higieno rok), pa tudi s plakati v vrtcu, posredovanjem zgibank ali različnega knjižnega gradiva. Nenazadnje vrtčevsko okolje preko kakovostnih programov vzgoje in varstva omogoča tudi, da se starši lahko posvetijo svojim delovnim obveznostim. Tudi vrtčevsko okolje lahko tako pomembno prispeva na pozitiven vzajemen odnos med otroci in njihovimi starši ter oboje spodbuja k zdravju koristnemu vedenju.

*Ključne besede:* zdravje, krepitev, starši, vrtec, vzgojiteljica

## How can kindergarten environment contribute to parents' health?

*Tanja Plevnik Peternelj*

**Introduction and purpose:** In this paper, we want to present good practices and possibilities with which preschool professionals and the kindergarten environment can influence the health of parents as members of the working-age population. In practice, we observe that patterns of children's behavior, even when health-related behaviors are taken care of, are significantly influenced by the patterns of their parents. It is extremely sensible to at least indirectly influence the health of their parents. According to SORS data, 87,187 children were enrolled in kindergartens for the 2018/19 school year, which means that at least 10% of the adult working-age population (parents) are connected to the preschool environment daily (according to SORS data, in June 2019, there were 897,213 employed individuals in Slovenia). One of the goals of preschool education in kindergartens (the Kindergarten Act) is to develop independence in hygiene habits and healthcare.

**Content presentation:** In the preschool, we carry out numerous preventive and educational actions that affect the behavior patterns of children. Educational goals, also guide and support awareness of health-related behaviors. One of the great opportunities that preschool professionals can offer is to raise the awareness of parents about the importance of taking care of their own health and well-being, thereby indirectly influencing the example they provide to children. Some examples of promoting such healthy behaviors are: care for hygiene (regular washing of hands before and after meals, after using the toilet; coughing in a sleeve, etc.), care for regular physical activity (encouraging daily outdoor physical activity, organizing various actions and events, e.g. Inter-generational cooperation, Physically Active day, etc.), raising awareness about national prevention programs and actions (World Wash Day "Clean Hands for All", Healthy Daily Rhythm, Mobility Week), care for well-being and quality peer relationships (School for parents, Lectures for Parents on different topics, e.g. Child and parent empowerment, Healthy attachment and others).

**Conclusions:** Health is a multifaceted process of taking care of for physical, mental and social well-being. Despite the assumption that adults take care of their own health, preschool teachers often find that these efforts often require encouragement for parents as representatives of the working-age population. Incentives are most often conveyed through children and occasional preschool activities (e.g. care for regular hand hygiene), as well as posters in kindergartens, distribution of leaflets or various book materials. Finally, through quality education programs the preschool environment also enables parents to devote themselves to their work responsibilities. The kindergarten environment can also make a significant contribution to the positive reciprocal relationship between children and their parents and encourage their healthy behaviors.

*Key words:* health, strengthen, parents, kindergarten, preschool teacher

## Stres in z njim povezani stresorji med slovenskimi policisti

Nastja Podrekar<sup>1,2</sup>, Kaja Kastelic<sup>3,1</sup>, Jure Žitnik<sup>1,2</sup>, Nejc Šarabon<sup>2,1</sup>

<sup>1</sup> InnoRenew Coe, Zdravje v grajenem okolju, Livade 6, 6310 Izola, Slovenija

<sup>2</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje, 42, 6310 Izola, Slovenija

<sup>3</sup> Univerza na Primorskem, Inštitut Andrej Marušič, Muzejski trg 2, 6000 Koper, Slovenija

**Uvod:** Policisti so na delovnem mestu izpostavljeni številnim dejavnikom tveganja, kot so izmensko in nočno delo, izpostavljenost tragičnim dogodkom, grožnjam in časovnemu pritisku. Delo policistov je specifično tudi zaradi pogo-  
blastil, s katerimi lahko ukrepajo zoper druge ljudi. Vse to se lahko odraža v povečanem stresu. Namen raziskave je bil ugotoviti prevalenco stresa in stresorjev med slovenskimi policisti ter proučiti povezave med stresom in sedenjem, telesno aktivnostjo in spanjem.

**Metode:** V raziskavi je sodelovalo 262 slovenskih policistov (starost  $43,8 \pm 7,0$  let; 73% moških), članov Sindikata policistov Slovenije. Sodelujoči so izpolnili prilagojen Vprašalnik za oceno stresa med policisti ter Vprašalnik o spanju, sedenju in telesni dejavnosti. Prevalenca stresa med slovenskimi policisti je bila analizirana s pomočjo opisne statistike, povezanost med spremenljivkami je bila analizirana s pomočjo Spearmanovega koeficienta korelacije.

**Rezultati:** Skoraj tretjina slovenskih policistov (26,5%) je poročala visoko stopnjo stresa zaradi delovnih obveznosti, 38,8% policistov je poročalo blago stopnjo stresa. Najpogostejši stresorji so bili utrujenost zaradi izmenskega dela in nadur, birokratične obveznosti in pomanjkanje časa za telesno dejavnost. Petina policistov (20%) je poročala o prisotnosti posttravmatskega stresa. Med policisti, ki so v zadnjih sedmih dneh sedeli več, je bila stopnja utrujenosti in izgorelosti višja ( $r = 0,22$ ;  $p = 0,001$ ). Poleg tega so se policisti, ki so uporabljali pasivni transport in več časa porabili za prihod ter odhod iz dela, pogosteje srečevali s pomanjkanjem časa za telesno dejavnost in zdrav način življenja ( $r = 0,21$ ;  $p = 0,001$ ) ter s pomanjkanjem časa za družino in prijatelje ( $r = 0,24$ ;  $p = 0,001$ ). Stres, kot posledica nadur na delu, je bil povezan z zdravstvenimi težavami, ki so posledica dela ( $r = 0,38$ ;  $p = 0,001$ ), utrujenostjo in izgorelostjo ( $r = 0,43$ ;  $p = 0,001$ ).

**Razprava in zaključek:** Programov promocije zdravja namenjenih slovenskim policistom primanjkuje. Rezultati naše raziskave nakazujejo na potrebo po interdisciplinarnemu pristopu za krepitev zdravja slovenskih policistov. Prav tako rezultati nakazujejo na potrebo po reorganizaciji delovnega časa in rednega ter usklajenega urnika dela predvsem za policiste, ki zaradi oddaljenosti doma od dela več časa porabijo za prihod na in iz dela. Za nadaljnje raziskave predlagamo izvajanje celovitega programa promocije zdravja, ki bi zajemal tako izobraževanje kot dolgotrajno podporo za izboljšanje zdravja in počutja slovenskih policistov.

**Ključne besede:** slovenski policisti, gibalna aktivnost, promocija zdravja, izgorelost

## Stress and Associated Stressors in Slovenian Police Officers

Nastja Podrekar<sup>1,2</sup>, Kaja Kastelic<sup>3,1</sup>, Jure Žitnik<sup>1,2</sup>, Nejc Šarabon<sup>2,1</sup>

<sup>1</sup> InnoRenew Coe, Human Health in the Built Environment, Livade 6, 6310 Izola, Slovenia

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

<sup>3</sup> University of Primorska, Andrej Marušič Institute, Muzejski trg 2, 6000 Koper, Slovenia

**Introduction:** Police officers are exposed to shift and night work, encounter tragic events, and often confront threats and time pressures. The work of police officers is also specific because of the authorisation by which they can act against other people. All this can be reflected in increased stress. The aim of this study was to assess the prevalence of stress and stressors among Slovenian police officers and to explore the relationships between stress and daily activity behaviours.

**Methods:** A total of 262 Slovenian police officers ( $43.8 \pm 7.0$  years, 73% males) from the Union of Slovene police officers (Sindikat policistov Slovenije) fulfilled web based adjusted Operational Police Stress Questionnaire to assess stress level, and Daily activity behaviours questionnaire (DAB-Q) to assess time spent in moderate to vigorous physical activity, sedentary behaviour and sleep. To assess the prevalence of stress and the relationship between the stress and activity behaviours, descriptive statistics and Spearman's rho correlation coefficient were performed.

**Results:** Almost one third of Slovenian police officers (26.5%) perceived high levels of stress due to work-related obligations and 38.8% of police officers perceived mild levels of stress. The most common stressors reported were fatigue due to shift and overtime work, paperwork, and lack of time to stay in good physical condition. Prevalence of posttraumatic stress among police officers was notable (20.1%). Fatigue and burnout were associated with higher levels of daily sitting ( $r = 0.22$ ;  $p = 0.001$ ). Moreover, more time spent for commuting was associated with self-reported lack of time for physical activity and healthy lifestyle ( $r = 0.21$ ;  $p = 0.001$ ) and lack of time for family and friends ( $r = 0.24$ ;  $p = 0.001$ ). Perceived stress caused by working overtime was associated with work-related health problems ( $r = 0.38$ ;  $p = 0.001$ ), and with fatigue and burnout ( $r = 0.43$ ;  $p = 0.001$ ).

**Discussion and conclusion:** Workplace programs to promote health and well-being of police officers are lacking. The results of our study emphasize the need for interdisciplinary health promotion for police officers. Moreover, the significant associations between higher commuting time and lack of time for physical activity, family and friends indicate the need for reorganisation of working time, and regular and well-coordinated schedules especially for police officers with longer driving distance to work. For the future intervention studies, programmes combining education and support for sustainable behavioural change are suggested to improve well-being and health of Slovenian police officers.

**Key words:** law enforcement, physical activity, health promotion, burnout

## Analiza zdravstvenega absentizma v Sloveniji od leta 2015 do leta 2019

Ticijana Prijon, Nina Pirnat, Ivan Eržen

Nacionalni inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija

**Uvod:** Zdravstveni absentizem ali bolniški stalež je začasna odsotnost z dela zaradi bolezni, poškodbe, nege in drugih zdravstvenih razlogov. Bolniški stalež ne izhaja le iz zdravstvenega stanja zaposlenega, temveč je lahko tudi posledica delovnih, socialnih, kulturnih, ekonomskih in drugih dejavnikov, ki so jim izpostavljeni delavci. Z vidika zdravstvenih, ekonomskih, socialnih in drugih posledic je bolniški stalež veliko breme tako za zaposlene, njihove delodajalce, izvajalce zdravstvenih storitev, nosilce socialnih zavarovanj, kot tudi za družbo v celoti. Bolniški stalež je pomemben vir informacij o zdravstvenem stanju delovno aktivne populacije, zato je redno spremljanje kazalnikov bolniškega staleža pogoj za obvladovanje tega pojava.

**Metode:** V retrospektivni raziskavi smo analizirali gibanje bolniškega staleža v Sloveniji od leta 2015 do leta 2019. Opredelili smo trend odstotka (%BS) in števila (IO) izgubljenih dni na enega zaposlenega, število primerov na sto zaposlenih (IF), povprečno trajanje ene zadržanosti od dela (R) in število oseb z dolgotrajnim bolniškim staležem.

**Rezultati:** Od leta 2015 dalje se trend odstotka izgubljenih koledarskih dni na zaposlenega (% BS) v Sloveniji povečuje; v letu 2015 je znašal 3,97 %, v letu 2019 pa 4,86 %. Prav tako se povečuje število izgubljenih dni na enega zaposlenega delavca (IO), od 14,48 dni v letu 2015 na 17,43 dni v letu 2019 ter povprečno trajanje ene zadržanosti od dela (R), od 13,85 dni v letu 2015 na 15,15 v letu 2019. V letu 2015 je bilo število primerov bolniškega staleža na sto zaposlenih (IF) 104,48, v letu 2019 pa je število primerov naraslo na 117,06.

V primerjavi z letom 2015 se je v letu 2019 število vseh oseb z dolgotrajnim bolniškim staležem (daljši od 45 dni) povečalo za 45 % (od 19.038 na 27.570), število oseb z bolniškim staležem, daljšim od enega leta, pa kar za 82 % (od 4.589 na 8.368).

**Razprava in zaključek:** Naraščanje bolniškega staleža v Sloveniji je mogoče povezati z različnimi dejavniki, predvsem pa z rastjo števila zaposlenih, staranjem in posledično večjo obolevnostjo aktivnega prebivalstva, prezentizmom v preteklih letih, dolgotrajnejšimi postopki diagnostike in zdravljenja in spremenjenimi razmerami na delovnih mestih. Tudi sama sistemska ureditev odstopa od drugih evropskih držav, saj trenutno v Sloveniji še ni izdelanih sistemov in uveljavljenih mehanizmov za pomoč pri vračanju delavcev na delo po dolgotrajni bolniški odsotnosti ter učinkovite poklicne rehabilitacije. Naraščanju bolniškega staleža in iz njega izhajajočih negativnih gospodarskih, socialno-ekonomskih in družbenih posledic se ni mogoče izogniti brez širših sistemskih ukrepov. Učinkovito obvladovanje bolniškega staleža je moč zagotoviti le v okviru sistema z ukrepi, ki bodo usmerjeni v preventivne aktivnosti za ohranjanje zdravja delavcev in v obvladovanje psiho-socialnih tveganj na delovnem mestu.

**Ključne besede:** zdravstveni absentizem, kazalniki, zdravstveno stanje, delovno aktivna populacija



## Analysis of health-related workplace absenteeism in Slovenia from 2015 to 2019

Ticijana Prijon, Nina Pirnat, Ivan Eržen

National institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia

**Introduction:** Health-related workplace absenteeism, or sick leave, is a temporary absence from work due to illness, injury or the need to receive treatment and care, and other medical issues. Sick leave is not solely a matter of an employee's state of health, but is also a result of the work-related, social, cultural, economic and other factors to which workers are exposed. In terms of the health-related, economic, social and other consequences, sick leave represents a heavy burden for employees, employers, healthcare providers, social insurance providers and the society at large. As sick leave is an important source of information on health of the working age population, a regular monitoring of sick leave indicators is a precondition for its management.

**Methods:** In a retrospective study, we analysed the sick leave trends in Slovenia between 2015 and 2019. We defined the percentage and the number of days lost per employee, the number of cases of sick leave per 100 employees, the average duration of sick leave and the number of workers on long-term sick leave.

**Results:** Since 2015 the trend in the percentage of days lost per employee in Slovenia has been upward, from 3.97 % in 2015 to 4.86 % in 2019. Similarly, the number of days lost per employee is on the rise, from 14.48 days in 2015 to 17.43 days in 2019, as is the average duration of sick leave, from 13.85 days in 2015 to 15.15 days in 2019. In 2015 the number of cases of sick leave per 100 employees was 104.48. By 2019 this number had risen to 117.06.

In 2019 the total number of workers on long-term sick leave (i.e. longer than 45 days) increased by 45% compared to 2015 (from 19,038 to 27,570), and the number of those on sick leave of longer than a year increased by as many as 82 % (from 4,589 to 8,368).

**Discussion and conclusions:** The growing rate of sick leave in Slovenia can be linked to a variety of factors, in particular to the growing number of employees, the aging of the workforce, and consequently to an increased morbidity in the working age population, the phenomenon of presenteeism detected in the past, more protracted diagnostic and treatment procedures, and to the changed conditions in the workplace. The systemic regulation of managing sick leave in and of itself differs from that in other European countries, since Slovenia has so far failed to establish appropriate systems and mechanisms to help workers reintegrate into the workplace after a lengthy period of absence from work or an effective system of occupational rehabilitation. The growing trend in sick leave and its negative economic, socio-economic and social consequences cannot be tackled without any wide-ranging systemic measures involving a continuous interdepartmental and interdisciplinary cooperation. An effective management and control of sick leave can only be achieved within a system that carries out preventive measures to ensure that workers stay healthy, and at the same time manages psychosocial risks in the workplace.

**Key words:** health-related workplace absenteeism, indicators, state of health, working age population

## Z delom povezana kostno-mišična obolenja v Sloveniji v obdobju 2015–2018

Ticijana Prijon<sup>1</sup>, Dorjana Zerbo Šporin<sup>2</sup>, Nejc Šarabon<sup>2</sup>, Ivan Eržen<sup>1</sup>

<sup>1</sup> Nacionalni Inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija

<sup>2</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Kostno-mišična obolenja (KMO) so velik problem zdravja v Sloveniji in drugih državah Evropske unije, saj so najpogostejša z delom povezana težava v razvitem svetu. Te bolezni so deloma posledica degenerativnih procesov, ki se v telesu dogajajo s staranjem, v veliki meri pa so posledica spremenjenega načina življenja in dela, slabega življenjskega sloga, epidemije debelosti in upadanja telesne aktivnosti v delovno aktivni populaciji. Pri večini z delom povezanih KMO, gre za kumulativne okvare, ki jih povzročijo ponavljajoča se izpostavljenost dolgotrajnim obremenitvam pri delu v kombinaciji s psihosocialnimi in okoljskimi dejavniki. Premalo poudarka na ergonomsko urejenem delovnem okolju ter na upoštevanju smernic zdravega in varnega dela, kot tudi nezadostna skrb za lastno zdravje povečujejo tveganje za pojavnost KMO. Ta so že desetletja poglavitni razlog bolniškega staleža, dolgotrajne odsotnosti z dela ter delovne invalidnosti.

Metode: Retrospektivno smo analizirali trend gibanja kazalnikov bolniškega staleža (BS) zaradi KMO v odvisnosti od spola in starosti ter razlike v pojavnosti KMO v različnih gospodarskih panogah in dejavnostih. Opredelili smo število izgubljenih delovnih dni, odstotek izgubljenih dni na zaposlenega delavca (%BS) in povprečno trajanje začasne nezmožnosti za delo zaradi KMO od leta 2015 do leta 2018.

Rezultati: V zadnjih letih se BS zaradi KMO povečuje. V letu 2015 je bilo zaradi KMO izgubljenih 2.320.498 delovnih dni, v letu 2018 pa že 3.315.094 dni (42,9 % prirastek). Povečuje se tudi povprečno trajanje BS zaradi KMO (iz 29,1 dni v letu 2015 na 34,7 dni v letu 2018). Pojavnost KMO je v ženski populaciji bistveno večja (% BS 0,86 - 1,25 %) kot pri moških (% BS 0,61 % - 0,81 %). Incidenca KMO se s starostjo povečuje in je najvišja v starostni skupini od 45 do 64 let. Prav tako so KMO najpogostejši vzrok dolgotrajne nezmožnosti za delo in predstavljajo kar 28% vseh primerov BS daljših od enega leta. Že vrsto let je BS zaradi KMO največji v rudarstvu, v zdravstvenem in socialnem varstvu, v predelovalni dejavnosti, v dejavnosti javne uprave, obrambe in obvezne socialne varnosti ter v gradbeništvu.

Razprava in zaključki: Za spopad z rastočo pandemijo KMO je potrebno uvesti in izvajati kombinacijo ustreznih tehničnih, organizacijskih in administrativnih ukrepov na delovnem mestu ter krepiti zdrav življenjski slog zaposlenih. Za zmanjšanje bremena KMO je potrebno uporabiti integriran in multidisciplinarni pristop, ki vključuje ukrepe za preprečevanje in obvladovanje z delom povezanih KMO. Poleg tega moramo zagotoviti ustrezno rehabilitacijo in reintegracijo delavcev s KMO. Primeri dobrih praks kažejo, da navedeni ukrepi za zmanjševanje tveganj za nastanek z delom povezanih KMO prinašajo številne koristi kot so, izboljšanje delovnih razmer, večje zadovoljstvo in motiviranost delavcev, zmanjšan BS zaradi KMO, izboljšanje splošne varnosti ter povečanje produktivnosti.

*Ključne besede:* kostno-mišična obolenja, bolniški stalež, incidenca

## Work-related musculoskeletal disorders in Slovenia: 2015 – 2018

Ticijana Prijon<sup>1</sup>, Dorjana Zerbo Šporin<sup>2</sup>, Nejc Šarabon<sup>2</sup>, Ivan Eržen<sup>1</sup>

<sup>1</sup> National institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Trubarjeva 2, 1000 Ljubljana, Slovenia

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Musculoskeletal disorders (MSDs) are a major health problem in the EU, including Slovenia. In fact, MSDs are the most common work-related health problem in the developed world. This partly results from the degenerative processes in the aging population; however, there are also several cofounding factors, including inappropriate workplace settings, poor lifestyle, obesity epidemic, low physical activity, and sedentary behaviour among the working-age population. Most work-related MSDs involve cumulative impairments caused by continuous exposure to prolonged physical stress at work, in combination with psychosocial and environmental factors. For decades MSDs have been the main reason for sick leave, long-term absence from work and incapacity for work. The aim of this study was to analyse the trend in sick leave (SL) due to MSDs.

**Methods:** We retrospectively analyzed the trend in sick leave (SL) due to MSDs in relation to sex and age and following the incidence of MSDs across different economic sectors and activities. The number of lost working days, the percentage of lost days per employee (% SL) and the average duration of temporary incapacity for work due to MDSs from 2015 till 2018 were defined.

**Results:** Sick leave (SL) as a result of MSDs has been on the increase in Slovenia. If 2,320,498 working days were lost to MSDs in 2015, the number in 2018 had risen by 42.9%, amounting to 3,315,094. The average duration of SL caused by MSDs has also been increasing, from 29.1 days in 2015 to 34.7 days in 2018. The incidence of MSDs is considerably higher among women (% SL 0.86–1.25%) than among men (% SL 0.61–0.81%). The MSDs incidence increases with age, reaching its peak in the 45–64 age group. MSDs are the most common cause of long-term incapacity for work, accounting for as many as 28% of all cases of SL for more than a year. For several years, SL due to MSDs has been highest in mining, health and social care, manufacturing, public administration, military, and police forces, and in construction.

**Discussion and conclusions:** To address the growing MSDs pandemic, we must introduce and implement a combination of appropriate technical, organisational, and administrative measures in the workplace, as well as enhance a healthy lifestyle of our workers. To minimize work-related MSDs, we must adopt an integrated and multidisciplinary approach that includes measures to prevent and manage MDSs. Furthermore, rehabilitation and work reintegration of people with MSDs should be strengthened in order to gain better mid- and long-term outcomes for the workers, health system and economy. Examples of good practice indicate that these measures to reduce the risk of developing work-related MSDs bring diverse benefits, such as improved working conditions, greater satisfaction and motivation of workers, a reduction in sick leave due to MSDs, improvements in general safety, as well as an increase in productivity.

**Key words:** musculoskeletal disorders, sick leave, incidence

## Percepcije gibalnih ukrepov promocije zdravja med delovnim časom – kvalitativna eksploratorna študija v okviru projekta STAR-VITAL

Martin Schultze<sup>1</sup>, Klemen Širok<sup>2</sup>

<sup>1</sup> Institute of Public Health, Charité Universitätsmedizin, Berlin, Germany

<sup>2</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Staranje delovne populacije predstavlja izziv prihodnosti za starajoče se družbe. Za doseganje dobrega zdravja morajo posamezniki živeti aktiven življenjski slog tekom celotnega življenja. Razumevanje kulture dela je ključno za zagotavljanje uspešnih in trajnostnih ukrepov, ki v osnovi ciljajo na doseganje tako sprememb pri posameznikih kot organizacijah. V študiji se osredotočamo na delavce v izbranem podjetju in raziskujemo njihove izkušnje, odnos in pričakovanja tako glede zdravega življenjskega sloga. Poleg tega raziskujemo še individualne vire in socialni kapital zaposlenih in vplive, kako ti dejavniki skozi habitus omejujejo in strukturirajo (zdravstvene) odločitve zaposlenih osredotočene na telesno aktivnost.

Metode: Da bi spoznali, kako delavci dojemajo pomembnost telesne dejavnosti med delovnim časom in kako se medsebojno vplivajo posamezne kompetence in strukturne zmogljivosti, smo v izbranem slovenskem podjetju, ki sodeluje pri projektu Star-Vital, izvedli fokusne skupine in 10 polstrukturiranih kvalitativnih intervjujev, ki so bili posneti in prepisani. Na anonimiziranih podatkih je bila izvedena kvalitativna analiza vsebin.

Rezultati: Z zdravjem povezana vedenja so tesno povezana s širšimi vrednostnimi sistemi, vedenjskimi normami in percepcijo telesa, ki so lahko tipična za nekatere (sub)kulture. Pridobljene so v okolju, v katerem ljudje živijo, delajo in rekreirajo ter so družbeno priučene skozi celotno življenjsko obdobje. Na podlagi koncepta salutogeneze se v raziskavi osredotočamo na občutek skladnosti dimenzij smiselnosti, upravljivosti in razumljivosti. Analiziramo motivacijske vidike, spretnosti in dostop do virov, pri čemer raziščemo tudi vlogo starosti in delovne zgodovine.

Razprava in zaključek: Individualno osredotočeni raziskovalni pristopi omogočajo prepoznavanje dejavnikov, ki podpirajo dobro počutje, kot tudi razumevanje mehanizmov za obvladovanje stresnih situacij in obremenitev, ki se pogosto pojavljajo na delovnih mestih. Da bi bili ukrepi promocije zdravja uspešni, je pomembno raziskati, kako se delavci odzivajo in soočajo s telesno dejavnostjo v svojih življenjskih okoljih. Opišemo vplive ukrepov promocije zdravja (na delovnem mestu) na dojetje zdravega načina življenja in na podlagi empiričnih ugotovitev razpravljamo o možnih izboljšavah in prilagoditvah Star-Vital pristopa. Empirične ugotovitve osvetlijo tudi obstoječe (teoretične) modele spodbujanja participacije v programih promocije zdravja na delovnem mestu.

*Ključne besede:* intervencije na delovnem mestu, salutogeneza, sposobnosti, kvalitativne metode

## Perceptions of physical activity interventions in a worksite in a Slovene company – a qualitative exploration study within the Star Vital project

Martin Schultze<sup>1</sup>, Klemen Širok<sup>2</sup>

<sup>1</sup> Institute of Public Health, Charité Universitätsmedizin, Berlin, Germany

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** The ageing work population is a demanding challenge of the future. To achieve a good health status, individuals have to live active lifestyles - throughout their whole lifespan. To gain insights and explore working cultures is mandatory for a successful, sustainable intervention that strives for individual and structural changes. In this study we focus on workers in the selected company and aim to explore experiences, attitudes and expectations participants discuss towards healthy lifestyles and intervention programs. Moreover, we try to focus on the individual resources and capital these workers have and ask how this limits and structures through their habitus the (health) choices (focused on physical activity) they make.

**Methods:** To grasp how workers perceive the importance of physical activity during worktime and how the interplay between individual competences and structural capacities plays out we did a focus group discussion and conducted 10 semi-structured qualitative interviews in a Slovene company that participates in the Star-Vital project. The interviews were audio-recorded and transcribed verbatim. Data were anonymised and analysed thematically.

**Results:** Health relevant behaviours are closely linked to broader value systems, behavioural norms, body perceptions among others that may be typical for certain (sub-) cultures. They are adopted according to the environments in which people live, work and recreate and they are socially learned throughout the life course. Based on the salutogenesis concept, in the interviews we focussed on the sense of coherence in the dimensions meaningfulness, manageability and comprehensibility/understandability. We analysed the motivational aspects, the skills as well as the access to resources. Another focus was on the role of age and the importance of work history/biography.

**Discussion and conclusions:** This individual centred research approach can be useful for identifying factors that support well-being as well as understanding coping mechanisms to overcome stressful situations and strains that often occur at worksites. To maintain a successful intervention, it was important to explore how workers respond to and negotiate concepts of physical activity within their own life worlds. We described impacts of health interventions on the perception of healthy lifestyles and based upon empirical findings discussed possible improvements or adjustments for the Star-Vital approach. Furthermore, findings even revealed some significant insights into the current models of how to stimulate active participation in workplace wellbeing programs beyond the Star-Vital project.

**Key words:** Work site interventions, salutogenesis, capabilities, qualitative methods

## Izvajanje promocije zdravja in učinki telesne dejavnosti na zmanjševanje izgorelosti pri učiteljih

Urška Simnovič Pišek<sup>1</sup>, Miha Marinšek<sup>2</sup>

<sup>1</sup> Gimnazija Litija, Bevkova 1 c, 1270 Litija

<sup>2</sup> Univerza v Mariboru, Pedagoška fakulteta, Koroška cesta 160, 2000 Maribor, Slovenija

**Uvod:** V prispevku predstavljamo del izidov pilotne raziskave o izvajanju promocije zdravja in učinkih telesne dejavnosti na zmanjševanje izgorelosti pri učiteljih. Programi promocije zdravja na delovnem mestu so namenjeni ohranjanju in krepitvi telesnega in duševnega zdravja ter dobrega počutja zaposlenih. V Sloveniji mora delodajalec zagotoviti potrebna sredstva in spremljati dejavnosti promocije zdravja. Učiteljski poklic je zahteven in povzroča težave pri telesnem in duševnem zdravju, kar se kaže predvsem v slabem delu v učilnici, večji bolniški odsotnosti ali celo opuščanju poklica. Zato je pomembno, da učiteljem zagotovimo ustrezno podporo tudi za telesno aktivnost, ki izboljšuje zdravje. Študija je bila izvedena z namenom ugotoviti, katere dejavnosti za krepitev zdravja vplivajo na ohranjanje telesne dejavnosti in napovedujejo zmanjševanje izgorelosti.

**Metode:** V pilotni raziskavi je sodelovalo 40 srednješolskih učiteljev, večina vprašanih je bila žensk (82,5 %), starih od 41 do 50 let (52,5 %). Podatke smo zbrali s pomočjo vprašalnikov: IPAQ, kratke in prilagojene dolge verzije, MBI – ES in z vprašalnikom, ki smo oblikovali za potrebe merjenja načrtovanja in izvajanja akcijskega načrta promocije zdravja na delovnem mestu. Pri učiteljih smo izmerili stopnjo splošne telesne dejavnosti, z analizo varianc primerjali razlike v stopnji splošne telesne dejavnosti (STDS) glede na čustveno izčrpanost (EE), depersonalizacijo (DP) in osebno izpolnitev (AP), s Spearmanovim koeficientom korelacije povezave med EE, DP, AP in stopnjo splošne telesne dejavnosti z multiplo regresijsko analizo pa proučili odnos med domenami EE; DP, AP ter dejavnostmi promocije zdravja.

**Rezultati:** Izidi merjenja dejavnikov splošne telesne aktivnosti so pokazali, da so najbolj telesno aktivni učitelji stari od 41 do 50 let (52,5 %). Večina vseh anketirancev je zmerno telesno aktivna, telesno aktivnost v povprečju ohranjajo s hojo in v povprečju sedijo 9 ur na teden. Izidi kažejo, da se z naraščanjem STDS povečujejo osebna izpolnitev, s povečanjem pogostosti telesne dejavnosti pa zmanjšuje čustvena izčrpanost učiteljev. Z multiplo regresijsko analizo smo oblikovali modele promocije zdravja, s katerimi smo napovedali stopnjo EE (23 %), DP (39 %) in AP (23,7 %). Spremenljivke za krepitev zdravja in socialno-demografske spremenljivke so bile uporabljene kot napovedovalci.

**Razprava in zaključek:** Analiza stanja izgorelosti je pokazala, da učitelji v povprečju dosegajo visoko stopnjo čustvene izčrpanosti in srednjo stopnjo depersonalizacije ter osebne izpolnitve. Ocenjujemo, da s celostno zasnovanim, ustrezno implementiranim in vrednotenim akcijskim načrtom promocije zdravja dosežemo pri zaposlenih zadostno motivacijo, da za svoje dobro psihofizično počutje skrbijo z redno telesno dejavnostjo in zdravo prehrano, pri čemer imajo koristi vsi udeleženci v delovnem procesu kot tudi njihove družine. Udeležanje promocije zdravja na delovnem mestu je dolgoročna naložba za zdravje zaposlenih.

**Ključne besede:** telesna vadba, stres, promocija zdravja

## Implementation of health promotion and the effects of physical activity on burnout reduction of pedagogical workers

Urška Simnovič Pišek<sup>1</sup>, Miha Marinšek<sup>2</sup>

<sup>1</sup> Gimnazija Litija, Bevkova 1 c, 1270 Litija

<sup>2</sup> University of Maribor, Faculty of Education, Koroška cesta 160, 2000 Maribor, Slovenia

**Introduction:** This paper presents some of the results of a pilot study on the implementation of health promotion and the effects of physical activity on reducing burnout in teachers. Workplace health promotion programs are designed to maintain and enhance the physical and mental health and well-being of employees. In Slovenia, the employer must provide the necessary resources and monitor health promotion activities. The teaching profession is demanding and causes problems in physical and mental health, which is mainly reflected in poor work in the classroom, greater sick leave or even leaving the profession. Therefore it is important to provide teachers with appropriate support for physical activity that improves health. The study was conducted to determine which health promotion activities affect the maintenance of physical activity and predict the reduction of burnout.

**Methods:** The pilot survey involved 40 high school teachers, with the majority of respondents being women (82.5%) aged 41-50 (52.5%). The data was collected using questionnaires: IPAQ, short and adapted long versions, MBI-ES, and a questionnaire designed to measure the design and implementation of the Workplace Health Promotion Action Plan. We measured the level of general physical activity in teachers and compared differences in general physical activity level (STDS) with respect to emotional exhaustion (EE), depersonalization (DP) and personal fulfillment (AP), using Spearman's correlation coefficient of association between EE, DP, AP and general physical activity level. We examined the relationship between EE domains by multiple regression analysis; DP, AP and health promotion activities.

**Results:** The results of measuring the factors of general physical activity showed that the most physically active teachers are between 41 and 50 years old (52.5%). Most of all respondents are moderate in physical activity, on average they maintain physical activity by walking and sit on average only 9 hours a week. The results show that as STDS increases, personal fulfillment increases and with increasing frequency of physical activity teachers' emotional exhaustion decreases. Through multiple regression analysis we designed health promotion models to predict EE (23%), DP (39%), and AP (23.7%) rates. Health promotion variables and socio-demographic variables were used as predictors.

**Discussion and conclusion:** The analysis of the burnout state has showed that teachers, on average, reach high levels of emotional exhaustion and intermediate levels of depersonalization and personal fulfillment. We estimate that a comprehensively designed, properly implemented and evaluated health promotion action plan provides employees with sufficient motivation to take care of their good psycho-physical well-being through regular physical activity and healthy nutrition. This benefits all participants in the work process as well as their families. Implementing workplace health promotion is a long-term investment for employee health.

**Key words:** exercise, stress, health promotion



## Pomen socialnih determinant za zdravje brezposelnih žensk: kvalitativna raziskava

Gordana Šokić, Mirko Prosen

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** Brezposelnost prinaša posledice, ki se kažejo na različnih ravneh. Dosev danje raziskave kažejo, da imajo brezposelni pogosto finančne težave, spopadajo se s stresom, njihove socialne mreže pa so pogostejše okrnjene. Tudi njihov življenjski slog lahko vodi k ustvarjanju pogojev za dejavnike tveganja za zdravje ter posledično k povečanim možnostim za nastanek kroničnih nenalezljivih bolezni. V raziskavi smo se osredotočili na povezanost socialnih determinant zdravja z brezposelnostjo žensk, kjer smo postavili v ospredje njihove občutke in doživljanja.

**Metode:** V raziskovalnem delu je bila uporabljena kvalitativna metodologija. Sodelovalo je enajst brezposelnih žensk, starih med 28 in 55 let, s katerimi smo izvedli delno strukturirane intervjuje. Metoda analize vsebine je potekala v naslednjih korakih: transkripcija, interpretacija, odprto kodiranje podatkov, ponovna interpretacija in kategorizacija v teme in podteme.

**Rezultati:** Identificirane so bile štiri osrednje teme (1) Izzivi zagotavljanja zdravega življenjskega sloga, (2) Doživljanje brezposelnosti in izraba časa, (3) Vpliv podpornih sistemov na soočenje z brezposelnostjo in razvijanje občutkov manjvrednosti in (4) Spremenjene okoliščine zaradi razpoložljivosti materialnih dobrin. Nekatere intervjuvanke so opisovale stres in probleme s psihičnim zdravjem, ki so jih zaznale že pred izgubo zaposlitve, povezani pa so lahko tudi z dalj časa trajajočo brezposelnostjo. V življenjskem slogu posameznic sta se telesna neaktivnost in neustrezne prehranjevalne navade izkazala kot bistvena razloga za težave v fizičnem zdravju. Za ohranjanje in krepitev zdravja so intervjuvanke najpogosteje uporabljale alternativne metode, kot so tehnike sproščanja in sprehodi. Večina je obdobje brezposelnosti doživljala kot priložnost za razbremenitev, izziv in možnost za izpolnitev zadanih ciljev. Različni pogledi na brezposelnost in izraba časa so se odražali na podlagi osebnih okoliščin in vizije za prihodnost. Čas v tem obdobju je bil vezan na iskanje zaposlitve, aktivnosti pa so se pretežno nanašale na dom, družino in gospodinjska opravila. V medosebnih odnosih so doživljale tudi občutke manjvrednosti, ki so bili povezani s predsodki in stereotipi o brezposelnih. Zaradi okrnjenega finančnega položaja, iskanja zaposlitve in odnosov so se intervjuvanke morale prilagoditi in iskati ustreznejše načine za zagotavljanje potreb.

**Diskusija in zaključki:** Rezultati kažejo, da so med udeleženkami velike razlike v doživljanju, kar potrjuje tesno povezanost in prepletenost različnih socialnih dejavnikov in okoliščin v odnosu do zdravja. Kaže se tudi močan vpliv socialnih mrež na ravnanje brezposelne osebe, na izvajanje aktivnosti in izbor strategije iskanja zaposlitve v tem obdobju. Na primarni ravni je zato naloga zdravstvenih delavcev, da se intenzivneje posvetimo omenjeni problematiki ter brezposelnim osebam s povečanim tveganjem ali specifičnimi težavami nudimo potrebno oporo ter jih usmerimo v programe, ki jim bodo v pomoč.

**Ključne besede:** socialno-ekonomski dejavniki, brezposelnost, življenjski slog



## The importance of social determinants for health of unemployed women: a qualitative research

*Gordana Šokić, Mirko Prosen*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** The consequences of unemployment manifest at different levels. The previous research shows that unemployed people often have financial problems and are under stress and their social networks are more often truncated. Their lifestyle can lead to the creation of conditions for health risk factors and consequently to increased chances for the development of chronic non-communicable diseases. In research, we focused on the connection of social determinants of health within women's unemployment with an emphasis on their feelings and experiences.

**Methods:** In the research part, we used a quantitative methodology. The sample consisted of eleven unemployed women, aged 28-55 years, with whom we did semi-structured interviews. The content analysis method was performed in the following steps: transcriptions, interpretation, open coding of data, re-interpretation and categorization into topics and subtopics.

**Results:** Four central themes identified (1) Challenges in ensuring a healthy lifestyle, (2) Experiencing unemployment and time usage, (3) Impact of support systems on coping with the unemployment and developing feelings of inferiority, and (4) Changed circumstances due to the availability of resources. Some interviewees' perceived stress and mental health problems before losing their jobs that may also be related to long-term unemployment. In the lifestyle of individuals, physical inactivity and poor eating habits have proved to be the essential reasons for physical health problems. To maintain and promote health, interviewees most often used alternative methods, such as relaxation techniques and walks. Most of them viewed the period of unemployment as an opportunity to relax, to take new challenges and to reach new goals.

Different views on unemployment and the use of time were reflected based on personal circumstances and a vision for the future. The time during this period was tied to finding a job, and activities diverted mainly to home, family, and household chores. They also experienced feelings of inferiority in interpersonal relationships that were linked to prejudices and stereotypes about the unemployed. Due to the truncated financial position, job search and relationships, interviewees had to adjust and find more appropriate ways to provide for their needs.

**Discussion and Conclusions:** The results show big differences in experience between the interviewees, which prove the close connection and intertwining nature of different social factors and circumstances concerning health. There is also a strong influence from social networks on the behaviour of the unemployed person, on the implementation of activities and the selection of a job search strategy. On the primary level, the task of health professionals is, therefore, to focus more intensely on the discussed issue, provide the necessary support for unemployed people with increased risk and special problems and to direct attention towards programmes, which would help them.

**Key words:** social-economic factors, unemployment, lifestyle

## Ukrepi za podaljšanje delovne sposobnosti zaposlenih v institucionalnem varstvu starejših

*Nataša Štandeker, Bojana Filej, Nadja Plazar*

*Alma mater europaeca Maribor-ECM, Slovenska ulica 17, 2000 Maribor, Slovenija*

**Uvod:** Staranje populacije prinaša s seboj številne družbene izzive, med katerimi je zagotovo zagotavljanje zadostnega števila zaposlenih v institucionalnem varstvu starejših. V večih raziskavah je bilo ugotovljeno, da predvsem diplomirani in negovalni zdravstveni kader pogosto zapušča poklic in izkorišča možnosti predčasnega upokojevanja, kar slabša že tako slabe kadrovske pogoje v institucionalnem varstvu starejših. Z lastno raziskavo smo želeli ugotoviti, s katerimi ukrepi za podaljšanje delovne sposobnosti bi bilo mogoče zmanjšati zapuščanje poklica in zgodnjega upokojevanja med zaposlenimi v institucionalnem varstvu starejših.

**Metode:** Raziskavo smo izvedli z uporabo metodologije delfie. V raziskavi, ki je potekala v treh krogih, je sodelovalo 12 priznanih strokovnjakov s področja managementa institucionalnega varstva starejših iz Avstrije, Hrvaške in Slovenije. V prvem krogu so strokovnjaki odgovarjali na vprašanja odprtega tipa, in sicer so predlagali ukrepe iz posameznih elementov delovne sposobnosti, kot so predlagani v modelu delovne sposobnosti. Predlagane ukrepe so v nadaljnjih dveh krogih z uporabo petstopenjske Likartove lestvice razvrstili po pomembnosti implementacije v delovne procese.

**Rezultati:** Sodelujoči strokovnjaki so v prvem krogu raziskave skupno predlagali 123 ukrepov za podaljšanje delovne sposobnosti zaposlenih v institucionalnem varstvu starejših. Na seznam najbolj pomembnih ukrepov so umestili skupno 21 ukrepov.

**Razprava in zaključek:** Predlagani ukrepi predstavljajo vodilo nadaljnjemu delu v managementu na področju zagotavljanja zadostnega števila zaposlenih v delovnih procesih v institucionalnem varstvu starejših in ukrepanja v smislu zmanjševanja stopnje fluktuacije med zaposlenimi na tem področju.

**Ključne besede:** delovna sposobnost, institucionalno varstvo starejših, ukrepi za podaljšanje delovne sposobnosti

## Measures to extend the working capacity of employees in the institutional care of the elderly

*Nataša Štandeker, Bojana Filej, Nadja Plazar*

*Alma mater europaea Maribor-ECM, Slovenska ulica 17, 2000 Maribor, Slovenia*

**Introduction:** The aging of the population brings with it a number of social challenges, among which certainly is the provision of a sufficient number of employees in the institutional care of the elderly. Several studies have found that mainly graduate and nursing staff often leave the profession and take advantage of early retirement opportunities, which worsens the already poor staffing conditions in the institutional care of the elderly. Through our own research, we wanted to find out what measures to extend working ability could reduce job abandonment and early retirement among employees in the institutional care of the elderly.

**Methods:** The research was performed using the delphia methodology. The research, which took place in three rounds, involved 12 renowned experts in the field of institutional care management for the elderly from Austria, Croatia and Slovenia. In the first round, the experts answered open-ended questions, proposing measures from individual elements of working capacity, as proposed in the working capacity model. In the next two rounds, the proposed measures were ranked according to the importance of implementation in work processes using the five-point Likart scale.

**Results:** In the first round of the research, the participating experts proposed a total of 123 measures to extend the working capacity of employees in the institutional care of the elderly. A total of 21 measures were placed on the list of the most important measures.

**Discussion and conclusion:** The proposed measures are a guide to further work in management in the field of ensuring a sufficient number of employees in work processes in institutional care for the elderly and action in terms of reducing the level of turnover among employees in this area.

**Key words:** working capacity, institutional care for the elderly, measures to extend working capacity

## **Poučevanje na daljavo: zaznavanje stresa, psihološko zdravje in zadovoljstvo z delom pri učiteljih**

*Janja Tekavc, Pia Novak*

*Univerza v Mariboru, Pedagoška fakulteta, Koroška cesta 160, 2000 Maribor, Slovenija*

**Uvod:** V času epidemije nalezljive bolezni SARS-CoV-2 (COVID-19) se je večina slovenske aktivne populacije srečala s spremenjenim načinom dela. Med njimi so bili tudi slovenski učitelji, ki so v času uvedenih ukrepov v boju širitvi virusa Covid-19 izvajali poučevanje na daljavo. Delo učitelja je sicer povezano s povečano stopnjo stresa, še zlasti, kadar so učitelji izpostavljeni številnim spremembam delovnega procesa (De Simone, Cicotto in Lampis, 2016). Z raziskavo smo želeli oceniti zaznane stopnje stresa pri učiteljih razrednega pouka v času poučevanja na daljavo, njihovo psihološko zdravje ter stopnjo zadovoljstva s svojim delom.

**Metode:** V raziskavi je sodelovalo 90 slovenskih učiteljev razrednega pouka. Ti so s pomočjo spletnega vprašalnika ocenili stres, ki ga doživljajo pri svojem delu, zaznane znake depresije, anksioznosti in splošnega stresa, ter stopnjo zadovoljstva s svojim delom. Izpolnjevanje testnega instrumentarija je potekalo dvakrat: v času izvajanja pouka na daljavo ter v času po preklicu epidemije nalezljive bolezni SARS-CoV-2 (COVID-19), ko so učitelji ponovno opravljali svoje delo v razredu.

**Rezultati:** Do sedaj analizirani podatki kažejo, da so v času opravljanja poučevanja na daljavo učitelji pri sebi zaznali povišano stopnjo stresa - tako na delovnem mestu, kot tudi sicer. Istočasno je bilo pri učiteljih v času epidemije zaznati tudi nekoliko povišano stopnjo splošne anksioznosti ter upad zadovoljstva z delom.

**Razprava in zaključek:** Zaradi nenadoma spremenjenega načina dela, ki je zahtevalo drugačno organizacijo dela, spremenjeno interakcijo z učenci, starši in sodelavci, ter povečano rabo informacijsko komunikacijskih tehnologij, je nivo zaznanega stresa pri učiteljih v času poučevanja na daljavo narastel, v skladu s tem pa je upadlo njihovo splošno psihološko zdravje ter zadovoljstvo z delom.

**Ključne besede:** SARS-CoV-2 (COVID-19), delo na daljavo, učitelji, stres, zadovoljstvo z delom

## Distance learning: perceived stress, psychological health and work satisfaction among teachers

*Janja Tekavc, Pia Novak*

*University of Maribor, Faculty of Education, Koroška cesta 160, 2000 Maribor, Slovenia*

**Introduction:** During the epidemic of the infectious disease SARS-CoV-2 (COVID-19), the majority of the Slovenian active population encountered a changed way of working. Among them were also Slovenian teachers who carried out distance learning during the measures introduced in the fight against the spread of the Covid-19 virus. Teacher work is otherwise associated with an increased level of stress, especially when teachers are exposed to many changes in the work process (De Simone, Cicotto, & Lampis, 2016). The aim of the research was to assess the perceived level of stress in classroom teachers during distance learning, their psychological health and the level of satisfaction with their work.

**Methods:** 90 Slovenian primary school teachers participated in the research. They used an online questionnaire to assess the stress they experience in their work, the perceived signs of depression, anxiety and general stress, and the level of satisfaction with their work. Testing procedure was completed twice: during the distance learning classes and after the cancellation of the SARS-CoV-2 infectious disease epidemic (COVID-19), when the teachers resumed their work in the classroom.

**Results:** The data analyzed so far show that during distance learning, teachers perceived an increased level of stress - both in the workplace and in general. At the same time, teachers at the time of the epidemic also showed a slightly increased level of general anxiety and a decline in their job satisfaction.

**Discussion and conclusions:** Due to the sudden change in the way of working, which required a different organization of work, changed interaction with students, parents and co-workers, and increased use of information and communication technologies, the level of perceived stress in teachers during distance learning increased, while their general psychological health and job satisfaction decreased.

**Key words:** SARS-CoV-2 (COVID-19), distance work, teachers, stress, work satisfaction

## Vadba na delovnem mestu: Sistematični pregled

*Nikola Todorovic, Valdemar Štajer, Nebojša Maksimović, Darinka Korovljev,  
Sergej Ostojić  
Faculty of sport and physical education Novi Sad, Lovćenska 16,  
21000 Novi Sad, Srbija*

Uvod: Vadbeni programi lahko pomembno vplivajo na učinkovitost delavcev. Izvajanje le-teh na delovnem mestu bi lahko bilo pozitivno povezano z zmanjšanjem nepotrebnih družbenih stroškov. Čeprav poznamo prednosti telesne vadbe, je zelo zanimivo tudi, katera vrsta in trajanje telesne aktivnosti sta najbolj primerna in učinkovita. Cilj tega pregleda je analizirati ugotovitve študij, ki so preučevale vadbene programe na delovnem mestu, ter njihov vpliv na delovno uspešnost in zdravje.

Metode: Iskanje literature je potekalo v podatkovni bazi PubMed (Medline) in Kobson. Pregledali so samo randomizirane kontrolirane študije (RCT), ki vključujejo vadbo ali telesno dejavnost na delovnem mestu.

Rezultati: Najdeno je bilo 309 študij z naslednjimi ključnimi besedami: vadba, delovno mesto, zdravje, intervencija. Po branju povzetka ali celotnega besedila je bilo v raziskavo vključenih skupno 10 študij. Večina raziskav, pet od teh, je svoje intervencije temeljilo na vadbi proti uporabi in/ali treningu moči, dve študiji sta preučevali učinke vaj za povečanje gibljivosti, medtem ko so preostale tri študije preučevale učinke več različnih vrst treningov. Rezultati večine raziskav so pokazali izboljšanje zdravja, delovne produktivnosti in motivacije.

Razprava in zaključek: Študije izbrane za analizo v našem pregledu kažejo, da obstajajo zmerni do močni dokazi za izvajanje vaj na delovnem mestu. Koristi so odvisne od dolžine in vrste intervencije. Dokazi podpirajo uporabo kratkih, preprostih vaj pri čemer so vaje za moč prinesle največ koristi. Glede intenzivnosti so mnenja deljena, vendar se zdi, da tako zmerne kot visoke intenzivnosti privedeta do izboljšav. Optimalno trajanje vadbe naj bi bilo med 10 in 15 minut dva do trikrat na teden.

*Ključne besede:* vadba na delovnem mestu, telesna aktivnost, intervencija, zdravje, intervencija

## Exercise at the workplace: A systematic review

*Nikola Todorovic, Valdemar Štajer, Nebojša Maksimović, Darinka Korovljević, Sergej Ostojić*  
*Faculty of sport and physical education Novi Sad, Lovćenska 16,*  
*21000 Novi Sad, Srbija*

**Introduction:** The exercise programs could have a significant impact on worker efficiency, and the implementation of these programs at the worksite could be positively related to reducing unnecessary societal costs. We are familiar with the benefits of physical exercise, but it is very interesting which type and duration of physical activity are most appropriate and effective. The goal of this review is to analyze the evidence of studies that examined worksite interventions that implemented physical exercise programs and their impact on work performance and health.

**Methods:** Search of the literature was conducted on PubMed (Medline) and Kobson database. Only randomized controlled trials (RCTs) including exercise or physical activity at the worksite were examined.

**Results:** Reviewing the literature, we found 309 studies following *Key words:* exercise, workplace, health, intervention. After reading the abstract or full text, a total of 10 studies were included in the research. Most studies, five of them, based their interventions on resistance training and/or strength training, two studies examined the effects of flexibility exercises, while the remaining three studies examined the effects of several different types of training. The results of most studies indicated improvements in health, work productivity, and motivation.

**Discussion and conclusion:** Altogether, studies retrieved for analysis in our review demonstrate that there is moderate to strong evidence to perform an exercise at the workplace. The benefits depend on the length and the type of intervention. The evidence supports the use of short, simple exercise. Strength exercises have led to the greatest benefits. In terms of intensity, opinions are divided, but both moderate and high-intensity exercises appear to lead to improvements. Exercise length is estimated to be optimal for about 10-15 minutes per session two to three times a week.

**Key words:** workplace exercise, physical activity, Intervention, health, intervention

## Vpliv različnih položajev med opravljanjem pisarniškega dela na aktivnost mišic ramenskega obroča

Tadej Vogrič, Matej Voglar

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** Vzdrževanje statične drže v sedečem položaju med opravljanjem pisarniških opravil zahteva dolgotrajno nizko statično naprežanje mišic, kar poveča verjetnost za nastanek mišično-skeletnih težav. Namen raziskave je preveriti kako pisarniško delo v različnih položajih, ki povečajo energijske zahteve, vplivajo na aktivacijo mišic ramenskega obroča in iztegovalk trupa.

**Metode:** K raziskavi smo povabili preiskovance, ki opravljajo pretežno sedeče delo in so sposobni deset-prstnega tipkanja ter ob tem večino časa ohranjati pogled usmerjen v zaslon. Izključitveni kriterij za izbiro merjencev je bila prisotnost akutnih ali kroničnih bolečin v vratnem in ramenskem predelu. Povabilu se je odzvalo 14 oseb (6 moških in 8 žensk). Vsak merjenec je sede, stoje in med kolesarjenjem izvedel dve standardizirani pisarniški opravili (tipkanje besedila in delo z miško) vsako v trajanju 7 minut. Vrstni red položajev je bil uravnoteženo izmeničen po načelu latinskega kvadrata (ang. Latin square). Med nalogami sta bili 2 minuti odmora. Pri izvajanju delovnih nalog smo obojestransko spremljali statično (10. percentil) in mediano (50. percentil) aktivnost vseh treh snopov mišice trapezius, mišice erector spinae in mišice deltoideus anterior. Spremljali smo tudi število razbremenilnih intervalov ter natančnost in hitrost tipkanja v vseh treh delovnih položajih.

**Rezultati:** Na statično aktivnost spodnjega snopa mišice trapezius sta statistično značilno vplivala tako položaj ( $F_{2,22} = 6,409$ ,  $p = 0,006$ ,  $\eta_p^2 = 0,368$ ), kot naloga ( $F_{1,11} = 5,487$ ,  $p = 0,039$ ,  $\eta_p^2 = 0,333$ ), statistično značilen je bil tudi interakcijski učinek položaja in naloge ( $F_{2,22} = 5,477$ ,  $p = 0,012$ ,  $\eta_p^2 = 0,332$ ). Na statično aktivnost mišice anteriorni deltoid sta statistično značilno vplivala tako dejavnik naloga ( $F_{1,13} = 8,767$ ,  $p = 0,011$ ,  $\eta_p^2 = 0,403$ ), kot tudi interakcijski učinek položaja in naloge ( $F_{2,26} = 6,977$ ;  $p = 0,004$ ;  $\eta_p^2 = 0,349$ ). Analiza mediane aktivnosti zgornjega snopa mišice trapezius je pokazala statistično značilen interakcijski učinek položaja in naloge ( $F_{1,18} = 3,831$ ,  $p = 0,041$ ,  $\eta_p^2 = 0,299$ ). Na mediano aktivnost mišice anteriorni deltoid sta statistično značilno vplivala tako dejavnik naloga ( $F_{1,13} = 21,175$ ,  $p = 0,000$ ,  $\eta_p^2 = 0,620$ ) kot tudi interakcijski učinek položaja in naloge ( $F_{2,26} = 12,746$ ,  $p = 0,000$ ,  $\eta_p^2 = 0,495$ ). Razbremenilnih intervalov je bilo največ izmerjenih za mišico anteriorni deltoid, medtem ko je bil pri ostalih mišicah pojav le teh redek.

**Razprava in zaključek:** Statična in mediana aktivnost spodnjega snopa mišice trapezius je bila v položaju stoje nižja v primerjavi s položajem sede. Med kolesarjenjem se je, v primerjavi s položajem sede, povečala mediana aktivnost mišice anteriorni deltoid, vendar le pri delu z miško. Produktivnost med položaji je bila nespremenjena. Rezultati do sedaj opravljenih študij, so z vidika obremenitve mišic skladni z rezultati naše raziskave, čeprav nekatere ugotavljajo slabšo produktivnost. Potrebne so dodatne raziskave.

**Ključne besede:** aktivna delovna postaja, mišična aktivacija, obremenitev mišice trapezius.



## The effect of various postures during office task work on shoulder girdle muscle activity

Tadej Vogrič, Matej Voglar

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Maintaining a static posture in a sitting posture, while performing office tasks, requires long-term low static muscle loading, which increases the risk of musculoskeletal problems. The aim of this study was to evaluate the impact of different working postures, during office task work, on shoulder girdle and thoracic extensor muscle activation levels. **Methods:** Subjects with predominantly sedentary work, capable of ten finger »blind typing« while maintain gaze fixed in computer screen, were invited to participate in our research. Presence of acute or chronic pain in the neck or shoulder area was set as an exclusion criterion. 14 people (6 men and 8 women) responded to the invitation. Each participant completed measurements within the same day. Two standardized tasks simulating office work (typing and working with mouse), each in duration of 7 minutes, were performed in sitting, standing and during cycling on cyclo-ergometer (50 W). Posture order was counterbalanced using Latin square method. There was 2 minute pause in-between each measurement. Muscle activation was measured bi-laterally and expressed as static (10. percentile) and median (50. percentile) for all three trapezius bundles, erector spinae and deltoideus anterior muscles. Speed and accuracy of typing was assessed in all three postures.

**Results:** The static lower trapezius bundle activity was statistically significantly affected by the posture ( $F_{2,22} = 6.409$ ,  $p = 0.006$ ,  $\eta_p^2 = 0.368$ ) and task ( $F_{1,11} = 5.487$ ,  $p = 0.039$ ,  $\eta_p^2 = 0.333$ ) furthermore, there was significant interaction effect of posture and task ( $F_{2,22} = 5.477$ ,  $p = 0.012$ ,  $\eta_p^2 = 0.332$ ). The static activity of the anterior deltoid muscle was statistically significantly affected by the factor task ( $F_{1,13} = 8.767$ ,  $p = 0.011$ ,  $\eta_p^2 = 0.403$ ) and the interaction effect of posture and task ( $F_{2,26} = 6.977$ ;  $p = 0.004$ ;  $\eta_p^2 = 0.349$ ). Analysis of the median upper trapezius bundle activity showed a statistically significant interaction effect of posture and task ( $F_{1,18} = 3.831$ ,  $p = 0.041$ ,  $\eta_p^2 = 0.299$ ). The median anterior deltoid muscle activity was statistically significantly affected by task ( $F_{1,13} = 21.175$ ,  $p = 0.000$ ,  $\eta_p^2 = 0.620$ ) and there was significant interaction effect of position and task ( $F_{2,26} = 12.746$ ,  $p = 0.000$ ,  $\eta_p^2 = 0.495$ ). The detection of gaps was most prominent in deltoideus anterior muscle, while the gap occurrence in other muscles was scarce.

**Discussion and conclusion:** The static and median lower trapezius bundle activity was lower in the standing posture compared to the sitting posture. During cycling, the median anterior deltoid muscle activity increased compared to the sitting posture, but only when performing mouse work. Productivity between positions was unchanged. In terms of muscle load, the results are in line with previous studies, although in contrary some of previous studies reported decline in productivity. Further research is needed.

**Key words:** active workstation, muscle activation, trapezius muscle loading.

## Promocija aktivnosti za preprečevanje kostno-mišičnih obolenj in psihosocialnih tveganj pri delu

Dorjana Zerbo Šporin<sup>1</sup>, Ticijana Prijon<sup>2</sup>, Nejc Šarabon<sup>1</sup>

<sup>1</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

<sup>2</sup> Nacionalni Inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija

**Uvod:** Kostno-mišična obolenja (KMO) in psihosocialna tveganja (PST) pri delu so že desetletja glavni vzrok zdravstvenega absentizma. Analiza stanja kaže, da se pojavnost KMO in PST v Sloveniji iz leta v leto povečuje, prav tako se zaradi KMO in PST podaljšuje povprečno trajanje ene bolniške odsotnosti. Tudi mednarodne študije navajajo, da so glede na ostale članice EU slovenski delavci med bolj izpostavljeni dejavnikom tveganja (stres in druge psihične obremenitve, težko fizično delo, prisilna drža, ročno premeščanje bremen, itd.), ki lahko negativno vplivajo na njihovo zdravje. V Sloveniji še ni uveljavljenih celostnih aktivnosti in ustreznih orodij, s katerimi bi lahko preprečili oz. zmanjšali pojavnost KMO in PST pri delu. Preprečevanje KMO in PST na delovnem mestu je v sklopu evropskega priporočila prepoznano kot ključen element za obvladovanje in odpravljanje tega pojava.

**Metode:** Promocija aktivnosti za preprečevanje KMO in PST pri delu (projekt) je skupni projekt NIJZ in UP FVZ. Osnovni namen projekta je s celostnim pristopom in sistematičnimi aktivnostmi vplivati na zmanjšanje pojavnosti KMO in PST pri delu ter zmanjšanje gospodarskih, socialno-ekonomskih in družbenih posledic naraščajočega pojava KMO in PST zaradi dela v Republiki Sloveniji.

**Rezultati:** Projekt bo izveden v treh fazah. V prvi bo na podlagi statističnih zdravstvenih podatkov pripravljena analiza pojavnosti najpogostejših KMO in PST pri delu v gospodarskih in drugih izbranih dejavnostih. Na podlagi izsledkov opravljene analize bo v drugi fazi projekta izdelano spletno interaktivno orodje s posameznimi vsebinskimi sklopi, ki bodo vsebovali opis zdravstvene problematike, etiologijo in epidemiologijo specifičnih KMO in PST ter tudi ustrezne ergonomske, psiho-socialne in kineziološke ukrepe za zgodnje odkrivanje, preprečevanje in obvladovanje KMO in PST pri delu. Tretja faza bo namenjena promociji izvedenih aktivnosti in usmerjanju ciljanih skupin k uporabi razpoložljivih orodij namenjenih zmanjšanju tveganja za pojav KMO in PST pri delu in obvladovanju njihovih posledic. Aktivnosti tega projekta so primarno namenjene vsem zaposlenim, kot tudi delodajalcem ter širši strokovni in zainteresirani javnosti.

**Razprava in zaključki:** V dotičnem projektu bo podana pojavnost KMO in PST glede na starost, spol, gospodarsko dejavnost in druge izbrane dejavnosti. Zastavljen projekt je neposredno usmerjen na preprečevanje in obvladovanje KMO in PST zaposlenih v Sloveniji, saj izhaja iz dejanske analize zdravstvenih podatkov. Projekt tako predstavlja neposredno povezavo med dejansko prevalenco najpogostejših oblik KMO in PST zaposlenih v Sloveniji ter možnimi preventivnimi in drugimi ukrepi za njihovo obvladovanje.

**Ključne besede:** kostno mišična obolenja, psihosocialna tveganja pri delu, preprečevanje, promocija aktivnosti

## Promotion of activities to prevent musculoskeletal disorders and psychosocial risks in the workplace

*Dorjana Zerbo Šporin<sup>1</sup>, Tিজiana Prijon<sup>2</sup>, Nejc Šarabon<sup>1</sup>*

<sup>1</sup> *University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

<sup>2</sup> *National institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Trubarjeva 2, 1000 Ljubljana, Slovenia*

**Introduction:** Musculoskeletal disorders (MSDs) and psychosocial risks (PRs) in the workplace are the main cause of absence from work. The incidence of MSDs and PRs in Slovenia has been on the rise, thus resulting in the increase in the average duration of absence from work for health reasons. International studies also confirm that Slovenian workers are exposed to the PRs (stress and other psychosocial hazard, etc.) that may have an adverse impact on their health. Moreover, Slovenia has yet to implement holistic activities and establish tools for preventing or reducing the incidence of work-related MSDs and PRs. The European guidelines recommend prevention as the most important element for managing and eliminating work-related MSDs and PRs.

**Methods:** The promotion of activities to prevent MSDs and PRs in the workplace is addressed by our ongoing project, run jointly by the National Institute of Public Health and the University of Primorska, the Faculty of Health Science. The project aims to implement a holistic approach and a range of systematic activities which should help reduce the incidence of work-related MSDs and PRs, as well as the economic, socio-economic, and social impact of the growing number of cases in Slovenia.

**Results:** The research project will be conducted in three phases. In the first phase an analysis of the incidence of the most common MSDs and PRs in the workplace in various activities will be carried out based on the health statistics. The results of the analysis will be then used in the second phase of the project to develop an online interactive tool, with individual sections containing descriptions of particular health issues, aetiology and epidemiology of specific MSDs and PRs, and appropriate ergonomic, psychosocial and kinesiological interventions for prevention and management of MSDs and PRs in the workplace. The third phase of the project will be devoted to the promotion of the project activities and the encouragement of the target groups to use the available tools, designed to reduce the risk of MSDs and PRs in the workplace and to manage their consequences. The project is focussed on all workers, employers, and related professionals.

**Discussion and conclusions:** The project itself will identify the incidence of MSDs and PRs in relation to a specific job characteristics. Based on the analysis of employee health-related data in Slovenia, the project is directly aimed at preventing and managing MSDs and PRs among workers. The project therefore constitutes a direct link between the actual prevalence of the most common MSDs and PRs affecting workers in Slovenia, and the possible preventive and other measures to manage and control them.

**Key words:** musculoskeletal disorders, psychosocial risks factors in the workplace, prevention, promotion

## Vpliv telesne aktivnosti na zdravje delovno aktivne populacije

Anton Zupan, Mitja Slapar

Univerzitetni rehabilitacijski inštitut Soča, Linhartova 51, 1000 Ljubljana, Slovenija

**Uvod:** Svetovno prebivalstvo se stara, posledično je povprečna starost delovno aktivne populacije iz leta v leto višja. S starostjo pride do slabšanja zdravstvenega stanja, pogostnost številnih kroničnih bolezni s starostjo narašča. Namen prispevka je prikazati pomen telesne aktivnosti (TA) na zdravstveno stanje delovno aktivne populacije.

**Metode:** Metoda dela je bila pregled literature, analiziranje in primerjanje dosežanj znanstvenih spoznanj o vplivu TA na zdravje delovno aktivne populacije. Temeljni inštrument zbiranja podatkov je bila znanstvena in strokovna literatura na izbrano temo v zadnjem obdobju.

**Rezultati:** V skladu s priporočili svetovne zdravstvene organizacije (SZO) naj bi odrasli ljudje izvajali vsaj 150 min na teden aerobne TA zmerne intenzivnosti ali 75 min intenzivne aerobne aktivnosti oziroma enakovredne kombinacije. Neupoštevanje teh priporočil povečuje tveganje za bolezni srca in ožilja, sladkorno bolezen tipa 2, rak dojke in debelega črevesa ter prezgodnjo smrt. Leta 2009 je SZO telesno neaktivnost opredelila kot četrti vodilni dejavnik tveganja za smrt, kar je povzročilo približno 6% smrtnih primerov na globalni ravni. Leta 2012 je bilo ocenjeno, da 31,1 % odraslega svetovnega prebivalstva ni izpolnilo priporočil glede telesne aktivnosti. Kronična telesna neaktivnost sproži kaskado dogodkov. Fizična neaktivnost je dejanski vzrok številnih nenormalnih fizioloških vrednosti (fizioloških disfunkcij), ki posledično povzročijo običajno trajne patološke spremembe (patofiziologija), ki sčasoma privedejo do kroničnih bolezni, te pa prispevajo k prezgodnji smrti. Leta 1990 so ugotovili, da je sedenčji življenjski slog kot dejavnik tveganja prispeval k 23 % smrti zaradi devetih najpogostejših kroničnih bolezni. Leta 2004 so telesni neaktivnosti in neustrezni prehrani pripisali 15,2 % smrti v ZDA. Leta 2015 pa so ocenili, da je 11,1 % vseh stroškov zdravstvenega varstva povezanih z „neustrezno“ telesno aktivnostjo in so označili telesno neaktivnost kot pomemben sestavni del epidemije kroničnih bolezni v ZDA in po vsem svetu.

**Razprava in zaključek:** TA je glavni dejavnik pri obvladovanju kroničnih bolezni, bolj pogosta in intenzivna TA je povezana z boljšim zdravstvenim stanjem ljudi. Mnoge države zato spodbujajo telesno aktivnost za izboljšanje zdravja prebivalstva. Nekatere države celo domnevajo, da se bo s povečanjem telesne aktivnosti prebivalstva, zmanjšala potreba po zdravstvenem in socialnem varstvu. Ljudje, ki redno izvajajo TA so bolj zdravi in živijo dlje. Vendar pa nezadostna TA še vedno ostaja eden največjih problemov življenjskega vzorca ljudi po celem svetu. Redno izvajanje TA je eden od temeljev promocije zdravja.

**Ključne besede:** telesna aktivnost, zdravstveno stanje, delovno aktivna populacija, kronične bolezni

## The influence of physical activity on health of the working-age population

*Anton Zupan, Mitja Slapar*

*University Rehabilitation Institute, Republic of Slovenia, Linhartova 51, 1000 Ljubljana, Slovenia*

**Introduction:** The world population is aging, as a result, the average age of the working-age population is increasing year by year. With age, there is a worsening of health, and the incidence of many chronic diseases increases with age. The purpose of the paper is to show the importance of physical activity (PA) on the health status of the working-age population.

**Methods:** The method of work was to review the literature, analyze and compare current scientific findings on the impact of PA on the health of the working-age population. The basic instrument of data collection has been the scientific and professional literature on a selected topic in the recent period.

**Results:** According to the recommendations of the World Health Organization (WHO), adults should exercise at least 150 minutes per week of moderate-intensity aerobic PA or 75 minutes of intense aerobic activity or equivalent combinations. Failure to follow these recommendations increases the risk of cardiovascular diseases, type 2 diabetes, breast and colon cancer, and premature death. In 2009, WHO identified physical inactivity as the fourth leading risk factor for death, resulting in approximately 6 % of deaths globally. In 2012, it was estimated that 31.1% of the adult world population did not meet the recommendations for PA. Chronic physical inactivity triggers a cascade of events. Physical inactivity is the actual cause of many abnormal physiological values (physiological dysfunctions) which in turn cause usually permanent pathological changes (pathophysiology), which eventually lead to chronic diseases, which contribute to premature death. In 1990, sedentary lifestyle as a risk factor was found to have contributed to 23 % of deaths due to the nine most common chronic diseases. In 2004, 15.2 % of deaths in the United States were attributed to physical inactivity and inadequate nutrition. In 2015, however, they estimated that 11.1 % of all health care costs were related to „inappropriate“ PA, and characterized physical inactivity as an important component of the United States and worldwide chronic disease epidemic.

**Discussion and conclusions:** PA is a major factor in the management of chronic diseases, more common and intense PA is associated with better human health. Many countries therefore encourage PA to improve the health of the population. Some countries even assume that as PA increases, the need for health and social care will decrease. People who regularly exercise are healthier and live longer. However, insufficient PA remains one of the biggest problems in living patterns of people worldwide. Regular PA is one of the cornerstones of health promotion.

**Key words:** physical activity, health status, working-age population, chronic diseases



**Sekcija/Section**  
**Prehrana in hidracija delovno aktivne**  
**populacije**  
**Nutrition and hydration of the working-age**  
**population**

---

## Vabljeno predavanje Invited lecture

### Vloga prebiotikov in probiotikov po gastrointestinalnih kirurških posegih

Zdravko Štor

Univerzitetni klinični center Ljubljana, Zaloška cesta 7, 1000 Ljubljana, Slovenija

Izhodišče in namen: Črevesna mikroflora, kot pomemben del intestinalne imunološke in neimunološke obrambe, je osnova koncepta probiotikov. To so živi mikroorganizmi, dodani hrani v zadostni količini, ki vplivajo na izboljšanje črevesne flore in vplivajo na zdravje.

Predstavitev vsebine: Najpomembnejši mehanizmi delovanja prebiotikov in probiotikov so sinteza protimikrobnih snovi, poraba hranil, ki so potrebna za rast patogene flore, inhibicija adhezije patogenih bakterij, modifikacija toksinov in toksinskih receptorjev, aktivacija imunskega sistema z zvišanjem tvorbe sekrecijskih imunoglobulinov ter zmanjšanjem tvorbe citokinov. Črevesna mikroflora je lahko izvor številnih zapletev po kirurških posegih, zaradi nefunkcionalne črevesne bariere in bakterijske translokacije. Probiotiki lahko ugodno vplivajo na črevesno steno in pomagajo zmanjšati pogostnost okužb pri tej skupini bolnikov.

Sklepna ugotovitev: Probiotiki se čedalje pogosteje uporabljajo v bolnišnicah za preprečevanje bolnišničnih okužb. Primer tovrstne uporabe je preprečevanje okužb po gastrointestinalnih kirurških posegih z dodajanjem probiotikov ali sinbiotikov (mešanic probiotikov in prebiotikov). V študijah so ugotovili zmanjšano pogostnost okužb kirurške rane ob uporabi probiotikov ali sinbiotikov. Ugotovili so tudi zmanjšano pojavnost diareje, zmanjšano pojavnost obstrukcij črevesja, zmanjšano število skupnih okužb in zmanjšano število pljučnic.

*Ključne besede:* prebiotiki, probiotiki, gastrointestinalni kirurški posegi



## **The role of prebiotics and probiotics after gastrointestinal surgery**

*Zdravko Štor*

*University Medical Centre Ljubljana, Zaloška cesta 7, 1000 Ljubljana, Slovenia*

**Starting and purpose:** The intestinal microflora, as an important part of the intestinal immune and non-immune defenses, is the basis of the concept of probiotics. These are living microorganisms added to food in sufficient quantities, which affect the improvement of the intestinal flora and affect health.

**Presentation:** The most important mechanisms of action of prebiotics and probiotics are the synthesis of antimicrobial substances, consumption of nutrients necessary for the growth of pathogenic flora, inhibition of adhesion of pathogenic bacteria, modification of toxins and toxin receptors, activation of the immune system by increasing the production of secretory immunoglobulins.

Intestinal microflora can be the source of many complications after surgery, due to a dysfunctional intestinal barrier and bacterial translocation. Probiotics can have a beneficial effect on the intestinal barrier and reduce the incidence of infections in this group of patients.

**Conclusion:** Probiotics are also increasingly used in hospitals to prevent nosocomial infections. An example of such use is the prevention of infections after gastrointestinal surgery by adding probiotics or synbiotics (mixtures of probiotics and prebiotics). Studies have shown a reduced incidence of surgical wound infection using probiotics or synbiotics. They also found a reduced incidence of diarrhoea, a reduced incidence of intestinal obstruction, a reduced number of common infections and a reduced number of pneumonias.

*Key words:* prebiotics, probiotics, gastrointestinal surgery

## Prehranski polifenoli in njihov vpliv na črevesno mikrobioto in zdravje ljudi

Katja Bezek, Darja Barlič – Maganja

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Namen:** V prispevku želimo predstaviti zaščitno vlogo prehranskih polifenolov in produktov njihove razgradnje na zdravje ljudi, s poudarkom o vplivu na sestavo črevesne mikrobiote.

**Predstavitev vsebine:** V zadnjem desetletju je bil oksidativni stres, povzročeni s reaktivnimi kisikovimi zvrstmi (ROS), prepoznan kot ključni dejavnik pri razvoju različnih bolezni, kot so sladkorna bolezen, bolezen srca in ožilja ter nevrodegenerativne motnje. Antioksidativna podpora, ki jo lahko zagotovimo tudi z ustrežno prehrano, lahko zmanjša negativne vplive oksidativnega stresa in pozitivno vpliva na naše zdravje. Rastlinska hrana predstavlja bogat vir biološko aktivnih spojin, med katerimi so zelo pomembni številni polifenoli. Zaradi njihovih dobro poznanih antioksidativnih lastnosti so polifenoli povezani s številnimi fiziološkimi učinki, ki zaščitno vplivajo na različne organe, tudi na prebavila. Polifenoli in produkti njihove razgradnje pomagajo vzdrževati zdravo črevesje predvsem z vplivom na sestavo črevesne mikrobiote. Zaradi prebiotikom podobnih učinkov lahko spodbudijo rast koristnih in zavirajo rast patogenih bakterij. Prav tako pa ima tudi črevesna mikrobiota pomembno vlogo pri presnovi polifenolov, nastajanju aktivnih metabolitov in povečanju njihove biološke uporabnosti. Vzajemno delovanje med prehranskimi polifenoli in črevesno mikrobioto lahko pozitivno vpliva na zdravje človeka.

**Zaključki:** Aktualne raziskave kažejo na to, da obstaja pozitivna povezava med prehranskimi polifenoli in zdravo sestavo črevesne mikrobiote. Zato bi bilo potrebno vključevanje živil rastlinskega izvora tudi na osnovi vsebnosti prehranskih fenolov obravnavati kot pomemben element, ki vpliva na zdravje delovno aktivne populacije.

**Ključne besede:** prehranski polifenoli, črevesna mikrobiota, zdravje človeka

## **Dietary polyphenols and their effect on the gut microbiota and human health**

*Katja Bezek, Darja Barlič – Maganja*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Purpose:** The aim of this review was to summarize the data on the protective role of dietary polyphenols and their metabolites on human health in general with an emphasis on gut microbiota modulation.

**Content presentation:** Over the past decade the oxidative stress, caused by reactive oxygen species (ROS) has been recognized as a key factor in the development of various diseases e.g. diabetes, cardiovascular diseases and neurodegenerative disorders. Antioxidant support, which can also be provided with proper nutrition, can reduce the negative effects of oxidative stress and have a positive effect on our health. Plant foods are a rich source of biologically active compounds, among them many polyphenols are very important. Due to their well-known antioxidant properties, polyphenols are associated with a number of physiological mechanisms that have protective effects on various organs, including the gastrointestinal tract. Polyphenols and their metabolites help healthy gut maintenance primarily through microbiota modulation. They have prebiotic-like effects, they can stimulate the growth of beneficial and inhibit the growth of pathogenic bacteria. In addition, the gut microbiota plays an important role in the metabolism of polyphenols, the production of active metabolites and their bioavailability. Therefore, the interaction between dietary polyphenols and gut microbiota can be of significant benefit to human health.

**Conclusions:** Current research indicates that there is a positive relationship between dietary polyphenols and the healthy composition of the gut microbiota. Therefore, the promotion of a diet rich in plant foods should also be considered as an important element affecting the health of the working population.

**Key words:** dietary polyphenols, gut microbiota, human health

## Slabše prehranjevalne navade v času karantene

Nives Bogataj, Karin Novak, Zala Jenko Pražnikar, Nina Mohorko  
Univerza na primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola,  
Slovenija

**Uvod:** Zaradi izbruha COVID-19 je bilo v začetku aprila polovica svetovnega prebivalstva v karanteni. Predhodne raziskave so pokazale, da sta primerna prehranjenost in zadostna telesna aktivnost (TA) povezani z boljším imunskim sistemom in lažjim potekom infekcijskih bolezni. Ljudje so bili v času karantene večino časa doma, kar je imelo za posledico zelo velike spremembe življenjskega sloga. Namen študije je bil raziskati spremembe prehranjevalnih navad med karanteno.

**Metode:** V študijo je bilo vključenih 49 odraslih (16 moških,  $34,8 \pm 9,1$  let, ITM:  $22,6 \pm 2,7$  kg/m<sup>2</sup>), preiskovanci so izpolnili vprašalnik o pogostosti uživanja živil (FFQ) pred in med karanteno. Vprašani so bili tudi, kje in kako pogosto nakupujejo hrano in ali se jim je telesna masa (TM) med karanteno povežala več kot 3 kg. 22 preiskovancev je poročalo tudi o splošnem apetitu (uporabili smo 5-stopenjsko lestvico) in apetitu za sladko in za prigrizke (uporabili smo 10-stopenjsko lestvico) in rešilo vprašalnik o TA (International Physical Activity Questionnaire - IPAQ), pred in med karanteno. Izračunali smo energijski vnos (EV), porabo energije s TA (PETA) in indeks zdravega prehranjevanja (HEI). Vrednosti pred in med karanteno smo primerjali s T-testom za dva odvisna vzorca.

**Rezultati:** EV se je zmanjšal z  $9,68 \pm 4,58$  MJ/dan ( $2311 \pm 1093$  kcal/dan) pred na  $7,89 \pm 3,16$  MJ/dan ( $1885 \pm 754$  kcal/dan) med karanteno,  $P=0,001$ , PETA se je zmanjšala z  $10,0 \pm 7,9$  MET/dan pred na  $5,0 \pm 6,4$  MET/dan med karanteno ( $P=0,009$ ), zaradi nižje TA povezane z delom in TA v prostem času. Povprečna vrednost HEI se je statistično značilno znižala med karanteno (pred karanteno:  $66,0 \pm 14,8$ , med karanteno:  $63,3 \pm 13,2$ ;  $P=0,026$ ), predvsem zaradi nižjega vnosa morske hrane in rastlinskih beljakovin, slabšega razmerja med vnosom nenasičenih in nasičenih maščobnih kislin (zaradi nižjega vnosa nenasičenih maščobnih kislin) in višjega vnosa natrija. Splošen apetit je ostal enak (pred karanteno:  $3,87 \pm 0,69$ , med karanteno:  $3,78 \pm 0,74$ ,  $P=0,58$ ), opazen pa je bil trend večanja apetita za sladko (pred karanteno:  $4,43 \pm 2,83$ , med karanteno:  $5,43 \pm 2,61$ ,  $P=0,08$ ). Apetit za prigrizke se ni statistično značilno spremenil (pred karanteno:  $4,3 \pm 2,27$ , med karanteno:  $4,91 \pm 2,47$ ,  $P=0,35$ ). Več kot 80 % preiskovancev je hrano kupovalo enkrat na teden ali samo 1-2-krat v 4 tednih. Samo trije preiskovanci so poročali o zvišanju TM za več kot 3 kg med karanteno.

**Diskusija in zaključki:** Prehranjevalne navade so bile med karanteno slabše, kljub temu, da sta se EV in TA znižala. Slabša kvaliteta prehrane in nižja TA v prvih 4 tednih karantene se nista odražali v zvišanju TM za več kot 3 kg pri zdravih odraslih s primerno TM.

**Ključne besede:** karantena COVID-19, kvaliteta prehrane, energijski vnos, telesna aktivnost

## Poorer diet quality during quarantine

Nives Bogataj, Karin Novak, Zala Jenko Pražnikar, Nina Mohorko  
University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Half of the world population was in quarantine in the beginning of April 2020, due to the outbreak of COVID-19. Preliminary researches showed that good nutritional status and adequate physical activity (PA) lead to a better immune defence and prognosis in case of infectious diseases. However, people were at home most of the time and as a consequence very big lifestyle changes occurred. The aim of the present study was to investigate dietary changes during quarantine.

**Methods:** Forty-nine adults (16 men,  $34.8 \pm 9.1$  years, BMI:  $22.6 \pm 2.7$  kg/m<sup>2</sup>) were included in the study, they filled out food frequency questionnaire (FFQ) before and during quarantine. The participants were asked where and how often bought food and to report a more than 3 kg increase in body mass (BM) during quarantine. Twenty-two participants reported their general appetite on scale 1-5 and on scale 1-10 appetite for sweet and snacks. They also completed a questionnaire about PA (International Physical Activity Questionnaire – IPAQ), before and during quarantine. Energy intake (EI), PA induced energy expenditure (PAEE) and Healthy Eating Index (HEI) were determined. Baseline and quarantine values were compared with Student's paired t-test.

**Results:** EI dropped from  $9.68 \pm 4.58$  MJ/day ( $2311 \pm 1093$  kcal/day) at baseline to  $7.89 \pm 3.16$  MJ/day ( $1885 \pm 754$  kcal/day) during quarantine ( $P=0.001$ ), PAEE dropped from  $10.0 \pm 7.9$  MET/day at baseline to  $5.0 \pm 6.4$  MET/day during quarantine ( $P=0.009$ ). PA was lower due to lower work-related PA and free time PA. The average HEI was significantly lower during quarantine (baseline:  $66.0 \pm 14.8$ , quarantine:  $63.3 \pm 13.2$ ;  $P=0.026$ ), mostly due to lower intake of seafood and plant proteins, poorer ratio of unsaturated to saturated fatty acids intake (on the account of lower unsaturated fatty acids intake) and higher intake of sodium. Although general appetite remained unchanged (baseline:  $3.87 \pm 0.69$ , quarantine:  $3.78 \pm 0.74$ ,  $P=0.58$ ), there was a trend in increase of appetite for sweet (baseline:  $4.43 \pm 2.83$ , quarantine:  $5.43 \pm 2.61$ ,  $P=0.08$ ). There were no statistical significant changes in appetite for snacks (baseline:  $4.3 \pm 2.27$ , quarantine:  $4.91 \pm 2.47$ ,  $P=0.35$ ). More than 80 % by participants bought food once a week or just once or twice in four weeks. Only three participants reported  $\Delta BM > +3$  kg during quarantine.

**Discussion and conclusions:** Despite the drop of EI and PAEE during quarantine, diet quality was poorer during quarantine. Lower diet quality and less PA during first four weeks of quarantine were not reflected in more than 3 kg increase in BM in healthy lean adults.

**Key words:** COVID-19 quarantine, diet quality, energy intake, physical activity

## Vpliv uživanja sladoleda s probiotikom na število kariogenih bakterij v slini zdravih odraslih

Dominika Češek, Katja Bezek, Boris Kovač

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Mikrobiota ustne votline je ena najpomembnejših in kompleksnih mikrobnihih združb v človeškem telesu. Neravnovesje v sestavi mikrobiote je lahko vzrok za bolezni ustne votline, kot sta karies in parodontitis, vodi pa lahko tudi do sistemskih bolezni. Karies, ki je posledica lokalne demineralizacije zobnega tkiva zaradi bakterijske aktivnosti, velja za eno najpogostejših kroničnih bolezenskih stanj na svetu. Nastanek kariesa je povezan predvsem s pogostostjo in količino zaužitih prehranskih sladkorjev in ostalimi dejavniki, kot so higiena ustne votline, tok in sestava sline ter poškodbe sklenine. Med kariogenimi bakterijami, ki jih povezujejo z nastankom kariesa, je najpogosteje izpostavljena vrsta *Streptococcus mutans*. Glede na nizko stopnjo učinkovitosti obstoječih metod pri nižanju števila kariogenih bakterij v ustih, se je tudi uživanje probiotikov pokazalo za enega izmed obetavnejših pristopov. Namen naše študije je bil ugotoviti, ali uživanje sladoleda z dodanimi probiotiki vpliva na število kariogenih bakterij v slini zdravih odraslih.

Metode: V dvojno slepi, kontrolirani študiji je bilo vključenih 11 zdravih preiskovancev, starih 20–50 let. Vzorci sline so bili odvzeti s CRT® komercialnim kitom ob pričetku študije in po 2 tednih uživanja sladoleda, z dodanima probiotičnima sevoma in sicer *Bifidobacterium animalis* subsp. *lactis* BB-12® (nu-trish® BB-12®) in *Lactobacillus acidophilus* (nu-trish® LA-5®), v koncentraciji vsaj  $1 \times 10^8$  CFU/g. Kontrolna skupina je uživala sladolede enake sestave, brez dodanih probiotikov. Preiskovanci so izpolnili tudi anketni vprašalnik o stopnji poznavanja in pogostosti uživanja kariogenih živil in živil ali dopolnil s probiotiki.

Rezultati: V primerjavi z začetno, se je koncentracija *S. mutans* v slini posameznikov iz kontrolne skupine, po 2 tednih povečala ali ostala enaka. V eksperimentalni skupini se je koncentracija *S. mutans* znižala, ob hkratnem povečanju koncentracije *Lactobacillus*. Skupno število dodanih probiotikov med 120-dnevnim shranjevanjem pri  $-20\text{ }^{\circ}\text{C}$  se ni spremenilo. Med preiskovanci se je pokazala nizka stopnja poznavanja pojmov probiotiki in kariogena živila.

Razprava in zaključek: Dobljeni rezultati kažejo na potencialno vlogo dodanih probiotikov na znižanje števila kariogenih bakterij *S. mutans* v slini in s tem pot k preventivi kariesa. Kljub temu, pomanjkljivost študije vidimo predvsem v majhnosti vzorca, vključiti pa bi bilo potrebno tudi stomatološko stroko. Poleg tega nizka stopnja poznavanja pojmov probiotiki in kariogena živila kaže na potrebo po vključitvi problematike v izobraževanje, kar bi posredno pripomoglo k izboljšanju zdravlja delovno aktivne populacije.

**Ključne besede:** mikrobiota ustne votline, karies, *Streptococcus mutans*, probiotiki

## The effect of probiotic ice cream consumption on salivary cariogenic bacteria in healthy adults

Dominika Češek, Katja Bezek, Boris Kovač

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Isola, Slovenia

**Introduction:** Human oral microbiota is one of the most important and complex microbial communities. Moreover, microbiota dysbiosis can lead to common diseases, including dental caries and periodontitis, and also systemic diseases. Dental caries as one of the most common chronic diseases worldwide is characterized by the localized destruction of the mineralized tooth tissues caused by bacterial action. There is a positive correlation between dental caries, frequency and amount of dietary sugars consumption, together with other factors, including oral hygiene, salivary flow and composition and also enamel defects. Additionally, *Streptococcus mutans* was often shown as dental-caries related bacteria. Since the traditional approaches can be unsuccessful in reducing the numbers of cariogenic bacteria, alternative approach such as probiotics consumption were proposed. Thus, the aim of the present study was to test the effect of probiotic ice cream on salivary cariogenic bacteria counts in healthy adults.

**Methods:** In the double-blind, placebo-controlled study 11 healthy participants, aged 20-50 years, were included. Saliva samples were collected using CRT® bacteria kit at day 0 and after 2 weeks of ice cream consumption. Probiotic ice cream contained two probiotic strains *Bifidobacterium animalis* subsp. *lactis* BB-12® (nu-trish® BB-12®) and *Lactobacillus acidophilus* (nu-trish® LA-5®) in concentration of approximately  $1 \times 10^8$  CFU/g. Participants also completed a questionnaire about knowledge and frequency of probiotics and cariogenic food consumption.

**Results:** After 2 weeks, the salivary cariogenic bacteria counts in the control group were the same or even higher, when compared to day 0. On the other hand, for participants consuming probiotic ice cream, *S. mutans* counts were lower with corresponding higher *Lactobacillus* counts. The total viability counts of probiotic bacteria did not change during 120-day storage at -20 °C. Nevertheless, the knowledge level of probiotics and cariogenic foods among participants was low.

**Discussion and conclusion:** The obtained results indicated the potential role of added probiotics in the reduction of salivary cariogenic bacteria. Thus, the probiotic ice cream consumption could have a potential role in the dental caries prevention. While sample size was the main study limitation, the study could also be improved by the dental exam results. Nevertheless, due to the observed lack of knowledge about probiotics and cariogenic foods the theoretical and practical approaches should be suggested to improve the health of working-age population.

**Key words:** oral microbiota, dental caries, *Streptococcus mutans*, probiotics

## Znanje športne prehrane slovenskih rekreativnih športnikov

*Eva Gorup, Nina Mohorko*

*Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija*

**Uvod:** V Sloveniji veliko število rekreativcev za treninge porabi toliko energije, da bi se za podporo treningom in ohranjanje zdravja morali prehranjevati po načelih športne prehrane. Medtem ko je v različnih medijih, namenjenih rekreativcem, precej člankov, namenjenih športni prehrani, ne vemo, koliko znanja iz športne prehrane imajo slovenski rekreativci.

**Metode:** Znanje o športni prehrani smo preverili s pomočjo Vprašalnika o znanju iz športne prehrane (Trakman idr., 2017), ki smo ga predhodno prevedli v slovenščino in validirali. Vprašalnik smo objavili v spletnem orodju za anketiranje, I-ka, in k reševanju vabili preko športnih interesnih skupin v socialnih omrežjih. Vključitveni kriteriji za sodelovanje v raziskavi so bili starost med 18 in 65 let in od 3 do 10 ur treninga na teden.

**Rezultati:** Od 362 oseb, ki je začelo reševati vprašalnik, smo dobili 133 ustrezno rešenih vprašalnikov, za katere so preiskovanci tudi ustrezali vključitvenim kriterijem. Šlo je večinoma za kolesarje in tekače. Znanje njihove športne prehrane je bilo povprečno ( $59,6 \pm 10,1$  % točk). Najbolj so poznali področji kontrole telesne mase ( $66 \pm 14$  % točk) in alkohola ( $70,9 \pm 15$  % točk), najslabše pa področji prehranskih dopolnil ( $48,6 \pm 17,5$  % točk) in načel športne prehrane ( $52,2 \pm 16,7$  % točk), ki so zajemala vprašanja o hidraciji in specifičnem vnosu makrohranil v časovni okolici treninga.

**Razprava in zaključek:** Kljub temu, da se je znanje športne prehrane vzorca slovenskih rekreativnih športnikov izkazalo za povprečno, je veliko prostora za izboljšave, predvsem na področju prehranskih dopolnil, katerih prodaja je v Sloveniji razširjena in ni regulirana, kot to velja za zdravila. Prav tako je za dobro podporo treningu in ohranjanje zdravja pomembno časovno ustrezno vnašanje makrohranil in tekočin, zato je potrebno rekreativce informirati tudi o tem področju.

**Ključne besede:** športna prehrana, rekreativni športniki, znanje



## Sports nutrition knowledge of Slovenian recreational athletes

*Eva Gorup, Nina Mohorko*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Background/Introduction:** Many Slovenian recreational athletes during training consume the amount of energy that requires eating according to sports nutrition principles to maintain health and support training. There are a lot of articles about sports nutrition in different media for recreational athletes, but we do not know how much knowledge Slovenian athletes actually have.

**Methods:** To test sports nutrition knowledge, we used the Nutrition for Sport Knowledge Questionnaire (Trakman et al, 2017) that we previously translated in Slovenian language and validated. We invited participants through sports interest groups on social networks where we pasted a web link to the questionnaire that was published in the online survey tool I-ka. Inclusion criteria were the age between 18 and 65 years and between 3 and 10 hours of training per week.

**Results:** Out of 362 athletes that started the questionnaire, 133 met our inclusion criteria. They were mostly cyclists and runners. Their nutrition knowledge was average ( $59,6 \pm 10,1$  %). They performed best in the sub-sections on weight management ( $66 \pm 14$  %) and alcohol ( $70,9 \pm 15$  %) and worst in the sub-sections on supplements ( $48,6 \pm 17,5$  %) and sports nutrition ( $52,2 \pm 16,7$  %) that covered questions on hydration and specific macronutrient intake before, during and after training.

**Discussion and conclusions:** Even though the knowledge of Slovenian recreational athletes was average, there is still room for improvement, especially in the field of supplements. Their sale is widely spread but is not regulated in contrast to medicines. Athletes need to be informed on how to regulate timing of macronutrient intake and fluids as this is important to maintain health and to support energy requirements for training.

**Key words:** sports nutrition, recreational athletes, knowledge

## Ugotavljanje prehranjevalnih navad delovno aktivne populacije

Magda Guček

Šolski center Šentjur, Cesta na kmetijsko šolo 9, 3230 Šentjur, Slovenija

**Uvod:** Zdravo delovno aktivno prebivalstvo je ključni element za zagotavljanje delovne uspešnosti, učinkovitega poslovanje podjetja in vzdrževanje dobrega socialnega stanja družine, skratka osebne in družbene rasti. Na zdravje delovno aktivnih ljudi vpliva mnogo dejavnikov, med katere sodi tudi prehrana. Kako se zaposleni prehranjujejo je odvisno od organizacije delovnega procesa, seveda pa tudi od načina priprave hrane v domačem okolju.

**Metode:** V okviru raziskovalnega dela v Šolskem centru Šentjur smo v več primerih primerjali prehranjevalne navade zaposlenih. Ugotavljali smo prehranjevalne navade zaposlenih v čistilnem servisu, poklicnih šoferjev ter zaposlenih v srednje velikem proizvodnem podjetju z organizirano prehrano. Raziskave so temeljile na anketiranju zaposlenih.

**Rezultati:** Zaposleni v čistilnem servisu ter poklicni šoferji si sami določajo čas za obrok, medtem ko imajo zaposleni v proizvodnem podjetju organizirano prehrano ob točno določenem času. Ugotovljeno je bilo, da imajo čistilke in šoferji slabe prehranjevalne navade in posledično neprimerno stanje prehranjenosti, kar se odraža tudi v prekomerni telesni masi. Večinoma se prehranjujejo s hladnimi obroki, ki temeljijo na večji količini kruha, pasteriziranih in steriliziranih mesnih izdelkih ter z malo oziroma nič sadja in zelenjave. Takšen način prehranjevanja jim predstavlja prihranek pri stroških in s tem večji neto prihodek. Prehranjevalne navade zaposlenih v proizvodnem podjetju so bistveno boljše kot pri prej omenjenih raziskovalnih skupinah. Delodajalec jim ponuja več menijev, ki se načeloma hranilno uravnoteženi. Znotraj proizvodnega podjetja se prehranjevalne navade zaposlenih razlikujejo glede na vrsto dela, pokazale pa so se tudi razlike med spoloma. Fizični delavci pogosteje zajtrkujejo kot zaposleni v skupnih službah. Ženske v obeh skupinah zaposlenih pogosteje sežejo po obrokih, ki presegajo njihove energijske potrebe, in imajo zato posledično v večjem deležu prekomerno telesno maso.

**Diskusija:** V naših raziskavah smo analizirali samo tri skupine zaposlenih. Zanimivo bi bilo opraviti podobno raziskavo pri zaposlenih v gostinstvu in turizmu, kjer predvidevamo, da je stanje prehranjenosti prav tako neustrezno. Menimo, da delodajalci prepogosto pozabljajo, kakšen strošek predstavlja zanje bolniška odsotnost. Če ga uspejo zmanjšati vsaj za en procent na račun zdravih prehranjevalnih navad, bo to prav gotovo dvakratna korist – zanje in za zaposlene.

**Ključne besede:** prehrana, navade, storitveni, proizvodni, delavci

## Assessing the eating habits of the working population

*Magda Guček*

*Šolski center Šentjur, Cesta na kmetijsko šolo 9, 3230 Šentjur, Slovenia*

**Introduction:** A healthy working population is a key element in ensuring good work performance, company effectiveness and maintaining the good social status of the family, in short, providing personal and society growth. Many factors influence the health of the working population, including nutrition. Eating habits depend on the organization of the work process and, of course, the way that people prepare food at home.

**Methods:** In the research work at the Šentjur School Center, we compared in several cases the eating habits of employees. We compared the eating habits of the employees in the cleaning service, professional drivers and employees of a medium-sized production company where the meals are provided by the company. We based our research on surveys with employees.

**Results:** The employees in cleaning service and the professional drivers determine their mealtime by themselves, while the employees of the manufacturing company have meals timely organized. Our researches revealed that cleaners and drivers have poor eating habits and consequently inappropriate daily intake of nutrients. A high percentage of them are struggling with obesity. Their diets mostly consists of cold meals based on a large amount of bread, pasteurized and sterilized meat products with little or no fruits and vegetables. These type of meals are cheaper and so present a savings for the workers and at the end higher net incomes. The eating habits of employees in the manufacturing company are, in principle, significantly better than in the aforementioned groups. Their employer offers them a variety of meals that, in general, are nutritionally balanced. These employees' eating habits vary by the type of work they do; moreover, we have also noticed differences between genders. Physical workers are more likely to have breakfast than workers who work in general affair service. However, women in both groups are more likely to choose meals that exceed their energy needs and, as a result, are often overweight.

**Discussion:** In our research, we analyzed only three categories of employees. It would be interesting to analyze the catering and tourism sector, where we assume the employees' malnutrition is common. We think that employers too often forget about the costs of sick leave. If they manage to reduce them at least for one percent by introducing healthy eating habits, they will benefit twice – themselves and their employees.

**Key words:** eating, habits, service, manufacturing, workers

## Pomanjkanje in sezonsko nihanje vitamina D pri odraslih Slovencih

*Maša Hribar, Hristo Hristov, Matej Gregorič, Urška Blaznik, Katja Zaletel, Adrijana Oblak, Joško Osredkar, Anita Kušar, Katja Žmitek, Irena Rogelj, Igor Pravst*

*Inštitut za nutricionistiko, Tržaška cesta 40, 1000 Ljubljana, Slovenija*

**Uvod:** Vitamin D je v maščobi topen vitamin, katerega glavni vir je izpostavljenost ultravijoličnem sevanju B (UVB), dodatno pa ga zaužijemo s hrano ter prehranskimi dopolnili. V Evropi je izpostavljenost kože soncu v zimskih mesecih premajhna, obenem pa je količina UVB sevanja prenizka za zadostno biosintezo vitamina D. Vitamin D ima ključno vlogo pri metabolizmu fosforja in kalcija, zadostne količine pa so bistvene za normalno rast, razvoj skeleta in optimalno mineralno gostoto kosti. Zaradi napisanega je doseganje in vzdrževanje optimalnega statusa D vitamina velikega pomena za individualno in javno zdravje v vseh življenjskih obdobjih. Prevalenčne študije po Evropi in svetu nakazujejo na precejšnje pomanjkanje vitamina D med prebivalci, zato je ključnega pomena, da se preuči prevalenca pomanjkanja vitamina D tudi v Sloveniji.

**Metode:** Preskrbljenost odraslih prebivalcev Slovenije z vitaminom D je bila raziskana v okviru nacionalne raziskave NUTRIHEALTH, ki je bila zasnovana kot razširitev nacionalne prehranske raziskave Si.Menu (2017/18), ki se je izvajala na reprezentativnem vzorcu prebivalcev Slovenije. Del udeležencev raziskave Si.Menu je bil povabljen v diagnostični laboratorij na odvzem bioloških vzorcev za analizo koncentracije 25(OH)D v krvi kot pokazatelja preskrbljenosti z vitaminom D. V skupini odraslih (starost 18-64 let) se je povabilu odzvalo 125 oseb, od tega 41,6% moških in 58,4% žensk. Kot mejo za pomanjkanje vitamina D smo upoštevali plazemsko koncentracijo 25(OH)D pod 30 nmol/L, za zadostno preskrbljenost koncentracijo nad 50 nmol/L, za optimalno preskrbljenost pa vsaj 75 nmol/L. Ker na koncentracijo vitamina D vpliva letni čas vzorčenja, smo vzorec razdelili na podaljšano poletje (maj-oktober; N=52) in podaljšano zimo (november-april; N=73).

**Rezultati:** Na celotnem vzorcu odraslih smo zaznali pomanjkanje (<30 nmol/L) vitamina D pri skoraj četrtini prebivalcev oziroma 24,9 %, nezadostno preskrbljenih je bilo 58,2 % (<50 nmol/L), ne-optimalno serumsko koncentracijo 25(OH)D (<75 nmol/L) pa smo ugotovili pri 83,3 %. Pri obravnavi v podaljšanem zimskem času je bila povprečna serumska koncentracija 25(OH)D 36,7 nmol/L (95 % interval zaupanja: 32,5-40,9), pri čemer smo pri 40,8 % ugotovili pomanjkanje, pri 81,6 % nezadostno preskrbljenost, kar pri 98,0 % pa ne-optimalno preskrbljenost. Optimalno je bilo tako preskrbljenih 2,0 % prebivalcev zajetih v študijo. Pri obravnavi v poletnem času pa je bila prevalenca pomanjkanja 2,6 %, nezadostno preskrbljenih je bilo 25,3 %, 62,6 % ljudi pa imelo ne-optimalno preskrbljenost.

**Razprava in zaključek:** Rezultati raziskave so pokazali na precejšnja sezonska nihanja preskrbljenosti odraslih prebivalcev Slovenije z vitaminom D, pomanjkanje pa je skladno s pričakovanj še posebej pogosto v zimskem času. Prevalenca pomanjkanja je med višjimi v Evropi in predstavlja javno-zdravstveni problem, zato je potrebno ustrezno ukrepanje na nacionalnem oziroma širšem evropskem nivoju.

**Ključne besede:** vitamin D, odrasli, pomanjkanje, sezonsko nihanje

## Vitamin D deficiency and seasonal variation among Slovenian adult population

*Maša Hribar, Hristo Hristov, Matej Gregorič, Urška Blaznik, Katja Zaletel, Adrijana Oblak, Joško Osredkar, Anita Kušar, Katja Žmitek, Irena Rogelj, Igor Pravst*

*Nutrition Institute, Tržaška cesta 40, 1000 Ljubljana, Slovenia*

**Introduction:** Vitamin D is a fat-soluble vitamin, which main sources are skin exposure to ultraviolet B light (UVB) radiation, and dietary intake with food or food supplements. In many European countries, sun exposure and intensity of UVB irradiation during most of the wintertime does not lead to any production of vitamin D in the skin. Vitamin D is involved in calcium and phosphorus homeostasis, and therefore plays a crucial role in bone health. With all that said, maintenance of optimal status is of great importance for individual and public health across all age groups. In Europe, many studies revealed a substantial vitamin D deficiency prevalence, therefore it is of utmost importance to elucidate prevalence of vitamin D deficiency in Slovenia.

**Methods:** Prevalence of vitamin D deficiency in Slovenia was investigated within national NUTRIHELATH study, which was designed as an extension arm to national food survey SI.Menu (2017/18). SI.Menu was conducted on national population representative sample, of which a subsample was invited to give blood sample for analysis of 25(OH)D concentration, a marker for vitamin D concentration. Within adult (age: 18-64 years) population 125 people participated with blood sample, of which 41.6 % was male and 58.4 % female. Vitamin D status was divided into categories according to 25(OH)D concentrations such as: deficient <30 nmol/L; insufficient < 50 nmol/L and optimal status >75 nmol/L. Since vitamin D concentration is strongly influenced by season, sample was divided into extended winter (November-April; N=73), and extended summer (May-October; N=52) period.

**Results:** When analysing year around data, vitamin D deficiency (<30 nmol/L) was detected in almost quarter (24.9 %) of participants, 58.2 % were insufficient (<50 nmol/L), while 83.3 % had 25(OH)D concentrations below 75 nmol/L. Looking only on data obtained in extended wintertime, average serum concentration of 25(OH)D was 36,7 nmol/L (95% CI: 32.5-40.9), 40.8 % of adults were, 81.6 % were insufficient, and 98.0 % had concentrations below <75 nmol/L. Thus, only 2.0 % of participants had sufficient vitamin D levels during wintertime. When looking only on data obtained in extended summertime, 2.6 % were deficient, 25.3 % were insufficient and 62.6 % of participants had concentrations below optimal.

**Discussion and conclusions:** Results of the study showed great seasonal variation in vitamin D concentrations in adult Slovenian population, with the deficiency especially pronounced in wintertime. The prevalence of deficiency in Slovenia was among highest in Europe and poses a possible public health risk, which should be addressed with appropriate recommendations and/or policy interventions. This can be done either on national, or better on the European Union level.

**Key words:** vitamin D, adult, deficiency, seasonal variation

## Energijski vnos in energijska razpoložljivost vzdržljivostnih športnikov

Tadeja Jakus, Mihaela Jurdana, Zala Jenko Pražnikar

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** Pokrivanje celodnevni energijskih potreb (CEP) in primerna energijska razpoložljivost (ER) sta ključnega pomena za ohranjanje zdravja športnika. Rezultati študij kažejo, da imajo vzdržljivostni športniki prenizke energijske vnose in vnose ogljikovih hidratov, kar povezujejo z nizko ER ter slabšo telesno zmogljivostjo. Namen raziskave je bil preveriti, kolikšna sta energijski in hranilni vnos vzdržljivostnih športnikov in ali je njihova ER ustrezna.

**Metode:** V raziskavo je bilo vključenih 17 odraslih moških, redno telesno aktivnih, ki so tek in kolesarjenje izvajali vsaj uro na dan. Telesno aktivnost smo beležili s tedenskim dnevnikom aktivnosti, s katerim smo spremljali vrsto, trajanje in intenzivnost vadbe. Aktivnost smo preračunali v povprečen metabolični ekvivalent (MET) v h/dan in v raziskavo vključili tiste, ki so dosegli  $\geq 10$  MET. Meritve telesne sestave smo opravili s pomočjo bioimpedance Tanita BC 418MA, prehranski vnos smo beležili s pomočjo metode tehtanja živil. Vnos hranil smo na podlagi tri-dnevnega prehranskega dnevnika analizirali z aplikacijo Odprta platforma za klinično prehrano (OPKP).

**Rezultati:** Rezultati kažejo, da je povprečna celodnevna športna aktivnost znašala 13 MET, kar ustreza kriteriju visoke aktivnosti. Energijski vnos je znašal 3032 kcal/dan in je bil nižji od ocenjenih CEP 3475 kcal/dan ( $p = 0,133$ ). ER je bila nizka (31 kcal/kg puste mišične mase/dan) in negativno povezana z odstotkom maščobne mase v telesu ( $r = -0,531$ ;  $p = 0,028$ ). Povprečen vnos ogljikovih hidratov je znašal 5,3 g/kg telesne mase in se je statistično značilno razlikoval od priporočil 7g/kg telesne mase ( $p = 0,01$ ). Vnos beljakovin (1,6 g/kg telesne mase) je bil v skladu s priporočili. Vnos maščob je bil na zgornji meji priporočljivih vrednosti (29 %), medtem ko je vnos holesterola (429 mg/dan) presegal priporočila ( $p = 0,020$ ).

**Razprava in zaključek:** Dokazali smo, da imajo športniki na treningih veliko porabo energije (13 MET), obenem pa je njihov energijski vnos pod priporočili. Dolgoročni nizek energijski vnos in velike porabe energije na treningih vodijo v izračunano nizko ER, kar predstavlja tveganje za zdravje. Vzdržljivostnim športnikom predstavljajo glavni vir energije ogljikovi hidrati, podobno kot druge študije, smo tudi mi pokazali, da je bil vnos le teh pod priporočili, medtem ko je bil vnos maščob in holesterola previsok. Vsi navedeni rezultati kažejo, da bi športniki potrebovali več prehranske podpore in izobraževanja, da bi izboljšali svojo ER in optimirali vnos hranil glede na svoje potrebe.

**Ključne besede:** Prehrana, energijska razpoložljivost, telesna aktivnost

## Energy intake and energy availability endurance athletes

*Tadeja Jakus, Mihaela Jurdana, Zala Jenko Pražnikar*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** Meeting energy demands of athletes and adequate energy availability (EA) are important goals for maintaining health of the athlete. The results of studies show, that endurance athletes have low energy and carbohydrates intakes, which is associated with low EA and poorer performance. Therefore, the purpose of the study was to determine the energy and nutritional intake of endurance athletes and whether their ER is adequate.

**Methods:** Seventeen healthy man participated in the study, who were running or cycling more than 1h/day. Information on physical activity was estimated using a questionnaire, which gathered information on the frequency, type, duration and intensity of daily physical activity. Total amount of daily physical activity was expressed in MET (h/day) and in the our study included those athletes, who achieved 10 MET or more. We assessed their body composition using bioimpedance Tanita BC418MA. Their dietary intake was recorded with three-day food record method. Nutrient composition and energy content were analyzed using the web tool Open platform for clinical nutrition (OPEN).

**Results:** The results show that the average sport activity was 13 METs, which meets the criteria of high intensity training. Energy intake was 3032 kcal/day and was lower than the estimated energy intake 3475 kcal/day ( $p = 0,133$ ). EA was low (31 kcal/kg fat free mass/day) and negatively correlated with % body fat ( $r = -0,531$ ;  $p = 0,028$ ). The average carbohydrate intake was 5,3 g/kg body weight and differed significantly from the recommendations 7g/kg body weight ( $p = 0,01$ ). Protein intake (1,6 g/kg body weight) was in accordance with the recommendations. Fat intake was at the upper limit of the recommended (29 %), while cholesterol intake (429 mg/day) exceeded the recommendations.

**Discussion and conclusions:** The athletes in our study had high energy expenditure (13 METs) in training, and at the same time energy intake under the recommendation. Long-term low energy intake in high energy expenditure in training leads to a calculated low ER, indicating health risk. The carbohydrates represent the main source of energy for endurance athletes, like other studies, we also showed that their intake was below recommendation in our study. On the other hand, the intakes of fat and cholesterol were higher than recommended. All the mentioned results indicate that athletes needed more nutritional support and education to be able to utilize their ER and optimizing nutritional intake for their needs.

**Key words:** Nutrition, energy availability, physical activity

## Zagotavljanje varne priprave živil med slovenskimi potrošniki

*Mojca Jevšnik, Lucija Pirc, Karmen Godič Torkar  
Univerza v Ljubljani, Zdravstvena fakulteta, Zdravstvena pot 5,  
1000 Ljubljana, Slovenija*

**Uvod:** Po podatkih EFSA je še vedno največ okužb/zastrupitev z živili pri pripravi živil doma. Potrošniki imajo premalo znanja o zagotavljanju varnosti živil oziroma znanja ne prenesejo v vsakodnevno prakso pri pripravi živil. Namen raziskave je bil ugotoviti znanje potrošnikov o varnosti živil, ustreznost ravnanja z izbranimi živili in odnos do zagotavljanja varnosti živil. Opazovali smo tudi higiensko stanje v kuhinjah sodelujočih v raziskavi.

**Metode:** Uporabili smo kombiniran metodološki pristop. Znanje 380 potrošnikov smo preverjali z anketnim vprašalnikom. V drugem delu raziskave smo opazovali 16 potrošnikov pri pripravi izbranih živil. Med njimi je bilo 8 potrošnikov starejših od 65 let in 8 mlajših od 35 let z majhnimi otroki. Potrošnikov pri pripravi izbranih živil smo izvedli z opazovalno listo. Higiensko stanje v domačih kuhinjah potrošnikov smo preverjali z odtisnimi lističi za ugotavljanje števila posameznih skupin mikroorganizmov, ustreznost čiščenja pa z merjenjem ATP-bioluminiscence.

**Rezultati:** Ugotovili smo, da je znanje potrošnikov o zagotavljanju varnosti živil pomanjkljivo. Po rezultatih vprašalnika, so najboljše znanje pokazali potrošniki, stari od 36 do 55 let, ženske so bile boljše od moških. Opazovani potrošniki so v nekaterih primerih pri pripravi živil ravnali nepravilno in s tem povzročili tveganje za navzkrižno onesnaženje živil, površin in delovnih pripomočkov. Večina potrošnikov je bilo prepričanih, da znajo varno pripraviti živila, imajo dovolj znanja in pravilno ravnanje z živili. Povečano skupno število mikroorganizmov, koliformne bakterije in bakterije *Escherichia coli* smo ugotovili le na testiranih površinah v kuhinjah pri 12, 75 % opazovanih potrošnikih. Rezultati ATP meritve so pokazali, da je bila več kot polovica vzorcev nesnažnih, kar kaže na pomanjkljivo čiščenje delovnih površin v kuhinjah potrošnikov.

**Razprava in zaključek:** Opazovani potrošniki kljub temu, da imajo nekaj znanja na področjih varnosti živil, tega znanja velikokrat ne prenesejo v prakso. Morali bi dosledneje skrbeti za osebno higieno, predvsem za večkratno in učinkovitejše umivanje rok. Temeljito in sprotno bi morali čistiti tudi delovne površine, pripomočke, pribor in posodo v kuhinjah. Bolj pozorni bi morali biti na preprečevanje navzkrižnega onesnaževanja, do katerega pride preko površin, ki prihajajo v stik z živili.

**Ključne besede:** potrošniki, varnost živil, znanje, ravnanje z živili, higiena



## Ensuring food safety among Slovenian consumers

*Mojca Jevšnik, Lucija Pirc, Karmen Godič Torkar*

*University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5,  
1000 Ljubljana, Slovenia*

**Introduction:** According to EFSA, most food borne diseases still happens at home. Consumers have insufficient knowledge of food safety and they do not transfer it properly into daily practice. The purpose of the research is to identify consumers' food safety knowledge and attitude, the handling of selected foods and hygiene in the kitchen.

**Methods:** We used mixed method approach. The knowledge of 380 consumers was examined with a survey questionnaire. In the second part of the study we observed 16 consumers, while they were preparing specific foods using an observation checklist. Eight consumers were older than 65, while eight of them were younger than 35 and have small children. The hygiene conditions in the consumers' kitchens were examined using contact plates for determination of the number of different groups of microorganisms, while the cleaning adequacy was determined by measuring the ATP bioluminescence.

**Results:** We established lack of food safety knowledge of certain topics; the consumers aged 36 to 55 and women have demonstrated the highest level of knowledge. In some cases, the consumers being observed did not take proper action when preparing the food and therefore increased the risk of the cross-contamination of foods, food contact surfaces and kitchen utensils. Most consumers believe that they prepare foods according to food safety requirements. The increased number of total bacterial count, coliform bacteria and the *Escherichia coli* bacteria was detected in only 12.75 % out of consumers kitchen observed. The results of ATP measurements showed that more than half of the samples of surfaces were not cleaned satisfactorily.

**Discussion and conclusions:** Greatest emphasis is needed in home kitchen cleaning. Even though the consumers have some knowledge of food safety (e.g. preventing cross-contamination, storing leftovers, using separate dishcloths), they often fail to put that knowledge into practice. Consumers should pay more attention to personal hygiene, especially to washing their hands more often and more thoroughly. They should clean the food preparation surfaces, utensils, cutlery and dishes in their kitchens more thoroughly and promptly. They should pay more attention to preventing cross-contamination from surfaces that come into contact with food.

**Key words:** consumers, food safety, knowledge, food handling, hygiene

## Evalvacija jedilnikov podjetja na Štajerskem

Anja Kerec

Zdravilišče Rogaška - Zdravstvo, Mariborska cesta 51/b, 2327 Rače, Slovenija

Uvod: Zdrava in uravnotežena prehrana je ključ do zdravja. Potrebe posameznika so različne glede na spol, starost, zdravstveno stanje kot tudi telesno aktivnost. Velik del aktivnega dneva preživimo na delu. Prehrana na delovnem mestu je tako izrednega pomena pri zdravem življenjskem slogu. Velikokrat pa je obrok na delovnem mestu neustrezen glede na potrebe posameznika. Namen prispevka je preveriti ustreznost jedilnikov podjetja na Štajerskem ter s priporočili doseči večjo uravnoteženost obrokov.

Metode in rezultati: Opravili smo evalvacijo jedilnikov podjetja na območju Štajerske regije. Podjetje zaposluje okrog 300 ljudi, ženske in moški v približno enakem razmerju. Večina delavcev opravlja lahko fizično delo, težko fizično delo opravlja le peščica moških delavcev. Delo poteka v treh izmenah. Podjetje ima organizirano malico za vse tri izmene, s hladno nočno malico. Opravili smo pogovor s kadrovsko predstavnico podjetja in ponudnikom prehrane glede priljubljenih jedi, velikost obrokov, razlike v prehranskih navadah delavcev, ipd. S Praktikumom jedilnikov zdravega prehranjevanja delavcev v delovnih organizacijah in s pomočjo orodij OPKP (odprta platforma za klinično prehrano) in Prodi, smo opravili analizo 20 različnih obrokov (izbor jedilnikov v mesecih marec, april in maj). Velikost porcij smo ocenili s pomočjo ponudnika prehrane in količinskimi normativi za pripravo obrokov. Ugotovili smo, da je večina obrokov (17) energijsko prebogatih, a hranilno revnih. Delež beljakovin v obrokih je bil po večini zadovoljiv, delež maščob (predvsem nasičenih) in enostavnih ogljikovih hidratov pa visok. Rezultate analize je podjetje objavilo v svoji interni publikaciji. Vsak jedilnik je bil opremljen s komentarjem in priporočili za izboljšanje uravnoteženosti obroka. Prav tako smo podali navodila za uravnoteženo malico delavcev nočne izmene, ki po večini vsebuje predelane mesne izdelke in enostavne ogljikove hidrate.

Razprava in zaključek: Raziskave Nacionalnega inštituta za javno zdravje Slovenije so pokazale, da je na splošno v naši prehrani preveč nasičenih maščobnih kislin, transmaščobnih kislin, soli, sladkorja in ojačevalcev okusa. Splošna raziskava prehranskih navad Slovencev kaže tudi, da uživamo premalo sadja in zelenjave. Trend kaže, da se stanje ozaveščenosti pomena pravilne prehrane izboljšuje.

*Ključne besede:* prehrana, delovno mesto, uravnotežena prehrana, energijske potrebe

## Evaluation of menus in a company in Styria

Anja Kerec

Zdravilišče Rogaška - Zdravstvo, Mariborska cesta 51/b, 2327 Rače, Slovenia

**Introduction:** Healthy and balanced diet is the key to health. The needs of an individual vary depending on sex, age, fitness level and also medical condition. A big part of our active day is spent at work. Nutrition at the workplace is of key importance for a healthy lifestyle. Unfortunately, the meal at the workplace doesn't fit the needs of an individual. The goal of this article is to evaluate the menu suitability of a company in Slovenian Styria and recommend improvements that would make the meals more balanced.

**Methods and results:** We made an evaluation of menus from a company in the Styria region. The company has about 300 employees, with the number of women and men being about the same. Most of the physical work is light, with a handful of men doing heavy physical work. The work is being done in three shifts. The company has organized meals for all three shifts with a cold meal for the night one. We interviewed the HR representative of the company and the meal supplier regarding the popular dishes, sizes of meals, differences in eating habits of workers, etc. With the help of Practicum of healthy eating habits for workers in work organizations and with aid of tools OPKP (Open Platform of Clinical Nutrition) and Prodi we analyzed 20 different meals (selection of menus for March, April, and May). The sizes of portions were estimated with the help of the meal supplier and quantitative standards for meal preparation. We discovered that most (17) of the meals were too rich in energy, but were nutrient-poor. The protein content of the meals was satisfactory, but they were high in fat (mostly saturated) and simple carbohydrates. The company posted the results of this analysis in their internal publication. Each menu was provided with commentary and recommendations to improve the balance of the meal. We also gave meal recommendations for the night shift workers, which previously contained a lot of processed meat and simple carbohydrates.

Research from the National Institute of Public Health of Slovenia showed that in general our nutrition contains too much saturated fats, trans fatty acids, salt, sugar and flavor enhancers. The research of Slovenian eating habits also showed that we don't eat enough fruit and vegetables. Trends show that the awareness of proper nutrition is increasing.

**Key words:** nutrition, workplace, balanced nutrition, energy needs

## Poznavanje in navade uživanja kislega zelja in repe med Slovenci

Martina Nagode, Katja Bezek

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Fermentacija je ena izmed prvih oblik predelave živil v človekovi prehrani. Njen namen je podaljšanje obstojnosti, večja varnost in izboljšanja organoleptičnih lastnosti živila. Postopek fermentacije lahko poteka ob prisotnosti naravno prisotne mikrobne združbe ali pa ob dodatku t. i. starter kultur. Metabolna aktivnost živih mikroorganizmov pomembno vpliva tudi na razpoložljivost in vsebnost hranilnih ter bioaktivnih snovi v živilu. Živost in število koristnih živih mikroorganizmov je odvisno od veliko dejavnikov, kot so pogoji shranjevanja in obdelava živila.

Metode: V sklopu študije o poznavanju in navadah uživanja kislega zelja in repe med Slovenci smo pripravili spletni vprašalnik in ga posredovali čim večjemu številu posameznikov, različnih starostnih skupin. Pridobljene podatke smo obdelali s pomočjo programa IBM SPSS Statistics 26.

Rezultati: V anketi je sodelovalo 24 moških in 151 žensk. Več kot polovica anketiranih ve, kaj so fermentirana živila, katera so in kako vplivajo na naše zdravje. Polovica anketirancev tudi sama pripravlja fermentirana živila in večina pozna dejavnike, ki vplivajo na sam proces fermentacije. Velika večina uživa kuhano ( $n = 152$ ) ali surovo ( $n = 121$ ) kisló zelje, nižji delež pa kuhano ( $n = 95$ ) ali surovo repo ( $n = 54$ ). Le nekaj anketiranih ( $n = 14$ ) kislega zelja ali repe ne uživa. Anketiranci so v zadnjem mesecu povprečno pojedli 179 g surovega in 204 g toplotno obdelanega kislega zelja ter 136 g surove in 188 g toplotno obdelane kisle repe.

Razprava in zaključek: Z uživanjem zadostnih količin kislega zelja in repe, tako surovega kot toplotno obdelanega, bi lahko dosegli ugoden učinek na imunski in prebavni sistem ter splošno zdravje delovno aktivne populacije. Živi mikroorganizmi s probiotičnim učinkom lahko pozitivno vplivajo na naše zdravje le, če jih uživamo v zadostni količini, kar pomeni dnevno vsaj  $10^8$  do  $10^{10}$  CFU. Slednje bi pomenilo uživanje 100 g živila z vsaj  $10^6$  CFU ml<sup>-1</sup>. Glede na povprečno zaužito količino surovega kislega zelja, ki znaša 179 g na mesec pa lahko zaključimo, da vnos živih mikroorganizmov samo s surovim kislím zeljem ali repo med Slovenci ni zadosten.

*Ključne besede:* kisló zelje, kislá repa, fermentacija, mikroorganizmi

## Sauerkraut and sour turnip consumption habits in Slovenia

*Martina Nagode, Katja Bezek*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** Fermentation is one of the earliest methods of food preservation. Along with extended shelf life of foods the fermentation process provided also higher safety and better organoleptic properties of the products. The fermentation process can be carried out with the naturally occurring microbial community or by the addition of the so-called starter cultures. The metabolic activity of microorganism significantly affects the bioavailability and concentration of bioactive compounds in the product. However, the viability and number of beneficial living microorganisms depends on many factors, such as storage conditions and processing conditions of the food.

**Methods:** In order to obtain the data on the knowledge and eating habits of sauerkraut and sour turnip among Slovene people, an online questionnaire was prepared. The obtained data were processed using IBM SPSS Statistics 26.

**Results:** In the present questionnaire based survey 175 individuals were included (24 M; 151 W). The majority of the participants showed great knowledge about the fermented foods and its health benefits. Moreover, a half of participants prepare fermented foods at home. In the last month the vast majority consumed cooked ( $n = 152$ ) or raw ( $n = 121$ ) sauerkraut, while the lower proportions consumed cooked ( $n = 95$ ) or raw turnip ( $n = 54$ ). Only a few ( $n = 14$ ) did not consumed any. On average 204 g of cooked and 179 g of raw sauerkraut and 188 g of cooked and 136 g of raw sour turnip was consumed in the last month.

**Discussion and conclusion:** By regular and adequate consumption of sauerkraut and sour turnip, both raw and heat-treated, a beneficial effect on the immune and digestive system and the general health of the working age population could be achieved. However, live probiotic microorganisms can positively effect human health only when consumed in sufficient concentration, that is at least  $10^8$  to  $10^{10}$  CFU per day. The last could be obtained by a daily intake of 100 g of product with at least of  $10^6$  CFU  $\text{ml}^{-1}$  live microorganisms. Considering this study results, the intake of live microorganisms only by raw sauerkraut or turnip consumption among Slovene people is not sufficient to achieve a probiotic effect.

**Key words:** sauerkraut, sour turnip, fermentation, microorganisms

## Vpliv uživanja kefirja in mleka na črevesno prepustnost

Karin Novak, Zala Jenko Pražnikar, Ana Petelin

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Kravje mleko in fermentirani mlečni izdelki že veliko let predstavljajo velik del naše prehrane in imajo ugodne učinke na zdravje. Kefir je fermentiran mlečni izdelek, ki vsebuje veliko število mlečnokislinskih bakterij in kvasovk. V gastrointestinalnem traktu se nahaja največja skupnost bakterij v človeškem telesu in znano je, da ima raznolika črevesna mikrobiota ter povečana črevesna prepustnost ključno vlogo pri vnetju, ki spremlja različne kronične bolezni in pri ohranjanju zdravja. Usmerja izražanje številnih genov v črevesju, ki so povezani z imunostjo, absorpcijo hranil, energijsko presnovo in funkcijo črevesne pregrade. Kljub razširjenosti mlečnih izdelkov smo zasledili zelo malo raziskav o vplivu uživanja kefirja in mleka na črevesje, predvsem pri ljudeh.

Metode: Izvedli smo longitudinalno intervencijsko raziskavo z naslovom »Vpliv uživanja kefirja na kazalnike presnovnega sindroma«, ki je potekala 4 mesece. Udeleženci so bili razdeljeni v dve skupini, ki sta 21 dni izmenično uživali kefir oz. mleko, z vmesnima fazama spiranja. Po vsaki fazi smo jim na tešče odvzeli vzorec venske krvi, izpolnili pa so tudi vprašalnik o gastrointestinalnih simptomih in Bristolsko lestvico konsistence blata.

Rezultati: Rezultati so pokazali, da ima v primerjavi z mlekom uživanje kefirja večji učinek na zmanjšanje koncentracije zonulina, markerja črevesne prepustnosti. Na serumsko koncentracijo glukoze, lipidni profil, vnetne markerje in apetit, pa je imelo tako uživanje kefirja kot uživanje mleka zelo podobne ugodne učinke. Nismo pa zaznali značilnih sprememb v pojavnosti gastrointestinalnih simptomov, z izjemo značilno zmanjšanega občutka napihnjenosti po uživanju kefirja. Po uživanju kefirja se je število odvajanj povečalo, po uživanju mleka pa zmanjšalo. Odstotek udeležencev, ki so blato odvajali vsak dan ob istem času, se je po uživanju kefirja zmanjšal, po uživanju mleka pa povečal.

Razprava in zaključek: Izvedli smo eno od prvih raziskav, ki je primerjala učinke kefirja in mleka na vrednosti zonulina in gastrointestinalne simptome pri zdravih asimptomatskih posameznikih. Pokazali smo, da bi bilo vsakodnevno uživanje kefirja lahko učinkovita strategija pri posameznikih s težavami z zaprtjem in napihnjenostjo. Trdni dokazi za uporabo probiotikov za večino zdravstvenih stanj še vedno primanjkujejo.

*Ključne besede:* kefir, mleko, zonulin, črevesna prepustnost, črevesje

## The effect of kefir and milk intake on intestinal permeability

*Karin Novak, Zala Jenko Pražnikar, Ana Petelin*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** Cow's milk and fermented dairy products have been a major part of our diet for many years and have beneficial health effects. Kefir is a fermented dairy product containing a large number of lactic acid bacteria and yeasts. The largest bacterial community in the human body is located in the gastrointestinal tract and it's known that a diverse gut microbiota and increased intestinal permeability plays a key role in inflammation that accompanies chronic diseases and in maintaining health. It modulates the expression of many genes in the gut that are associated with immunity, nutrient absorption, energy metabolism, and gut barrier function. Despite the prevalence of dairy products, there has been very little research done on the effects of kefir and milk intake on the intestine, especially in humans.

**Methods:** We performed a longitudinal intervention study entitled »The impact of kefir intake on metabolic syndrome indicators« that lasted 4 months. The participants were divided into two groups, each alternately consuming kefir or milk for 21 days, with two washout periods in-between. Venous blood was sampled (fasted) after each phase and the participants completed a questionnaire on gastrointestinal symptoms and a Bristol stool scale.

**Results:** Kefir supplementation resulted in a greater improvement of serum zonulin levels whereas significant yet similar improvement in lipid profile, serum glucose levels, inflammation markers and appetite were found in both supplementations. We did not observe significant changes in the incidence of gastrointestinal symptoms, with the exception of significantly decreased sensation of bloating after kefir intake. The average number of defecations increased after kefir intake and decreased after milk intake. The percentage of participants who defecated at a consistent time each day decreased after kefir intake and increased after milk intake.

**Discussion and conclusions:** We conducted one of the first studies comparing the effects of kefir and milk on zonulin levels and gastrointestinal symptoms in healthy asymptomatic individuals. We have shown that daily consumption of kefir could be an effective strategy for individuals with constipation and bloating problems. There is still a lack of solid evidence for the use of probiotics for most medical conditions.

**Key words:** kefir, milk, zonulin, intestinal permeability, intestine

## Prehranjevalne navade zaposlenih na različnih delovnih mestih

Mojca Stubelj<sup>1</sup>, Simona Perčič<sup>2</sup>, Matija Vodopivec<sup>3</sup>

<sup>1</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

<sup>2</sup> Nacionalni inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija

<sup>3</sup> Univerza na Primorskem, Fakulteta za management, Cankarjeva 5, 6000 Koper, Slovenija

Uvod: V Sloveniji poteka projekt »STAR-VITAL - Združeni ukrepi za vitalnost starejših delavcev«, ki izvaja različne intervencije za zaposlene. Z intervencijami na področju spreminjanja življenjskega sloga zaposlenih, vključno z zdravimi prehranjevalnimi navadami, lahko preprečimo prezgodnjo umrljivost, zmanjšamo pogostost kroničnih nenalezljivih bolezni. Posledice so pozitivni učinki na produktivnost za delodajalca ter pozitivni socialni in ekonomski učinki za družbo.

Metode: Raziskava je bila izvedena med zaposlenimi, ki so vključeni v projekt STAR-VITAL. Pred intervencijo so izpolnili presejalni vprašalnik. Analiziranih je bilo 863 odgovorov glede na indeks telesne mase (ITM), izbrane indikatorje prehranjevalnih navad, ter delovna mesta zaposlenih klasificirana kot (a) večinoma sedeče, (b) večinoma stoječe in (c) večinoma naporno delo. Povezavo med ITM in prehranjevalnimi navadami smo preverili s t-testom za dva neodvisna vzorca. Fisherjev test natančne verjetnosti je bil uporabljen za odkrivanje razlik v prehranjevalnih navadah med delovnimi mesti.

Rezultati: Zaposleni, ki bolj pogosto uživajo sadje ali polnozrnatih izdelke ali imajo dnevno vsaj tri obroke, imajo v povprečju nižji ITM. V povprečju imajo višji ITM zaposleni, ki bolj pogosto uživajo ocvrto hrano. Pregled deležev slabih prehranjevalnih navad je bil naslednji: 38 % zaposlenih uživa dnevno dva obroka ali manj. Manj kot enkrat na dan uživa zelenjavo 37%, sadje 39% zaposlenih. Enkrat na teden ali pogosteje uživa ocvrto hrano 39% zaposlenih. Trikrat na teden ali več uživa rdeče meso 45% zaposlenih. Ribe uživa le trikrat na mesec ali redkeje 69% zaposlenih. Izdelke iz polnozrnatih žit uživa le trikrat na mesec ali redkeje 55% zaposlenih. Pijače z dodanim sladkorjem uživa štirikrat na teden ali pogosteje 21% zaposlenih. Analiza je pokazala statistično značilne razlike med delovnimi mesti pri pogostosti uživanja zelenjave in polnozrnatih izdelkov.

Razprava in zaključki: Rezultati naše raziskave kažejo, da ima znaten odstotek delavcev v Sloveniji še vedno nezdrave prehranjevalne navade. Vsa delovna mesta so primerna za izvedbo intervencij.

**Ključne besede:** vnos hrane, delovna mesta, intervencije, ITM



## Eating habits of employees from different working places

Mojca Stubelj<sup>1</sup>, Simona Perčič<sup>2</sup>, Matija Vodopivec<sup>3</sup>

<sup>1</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

<sup>2</sup> National institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia

<sup>3</sup> University of Primorska, Faculty of Management, Cankarjeva 5, 6000 Koper, Slovenia

**Introduction:** “STAR-VITAL - healthy ageing at workplace» is the project in Slovenia which implements various interventions for employees. Through interventions the lifestyle of employees, including eating habits are changed. With healthy eating habits we can prevent premature mortality, reduce the incidence of chronic non-communicable diseases. The consequences are positive effects on productivity for the employer and positive social and economic effects for society.

**Methods:** The survey was conducted among employees involved in the STAR-VITAL project. A screening questionnaire was completed prior the intervention. Results are based on an analysis of 863 responses according to body mass index (BMI), selected indicators of eating habits, and working places classified as (a) mostly sedentary, (b) mostly standing, and (c) mostly hard work. The association between BMI and eating habits was confirmed with two sample independent *t*-test. Fisher exact probability test was used to detect differences in eating habits between working places.

**Results:** Employees who eat fruit or wholegrain cereals more often, have a lower BMI on average. Furthermore, employees who have at least three daily meals, have a lower BMI on average. On average, employees with higher BMI have more frequent consumption of fried foods. The review of the proportions of unhealthy eating habits was as follows: 38% of employees eat two meals or less a day. 37% of employees eat vegetables less than once a day. 39% of employees eat fruit less than once a day. 39% of employees eat fried food once a week or more often. 45% of employees eat red meat three times a week or more. 69% of employees eat fish three times a month or less. 55% of employees consume whole grain products only three times a month or less. Beverages with added sugar are consumed four times a week or more often by 21% of employees. The analysis showed statistically significant differences in eating frequency of vegetables and whole grain products between working places.

**Discussion and conclusions:** The results of our research show that a significant percentage of workers in Slovenia still have unhealthy eating habits. All working places are suitable for implementation of interventions.

**Key words:** food intake, working places, interventions, BMI

## Prehranska avtonomija družine v obdobju izrednih razmer

*Petra Vodopivec Kolar, Irena Hren*

*Splošna bolnišnica Novo mesto, Šmihelska cesta 1, 8000 Novo mesto, Slovenija*

**Uvod:** Glede na aktualno dogajanje ob epidemiji covid-19 nas je zanimalo, kakšna bi morala biti družinska zaloga živil, če bi hoteli vsem članom družine zagotoviti uravnoteženo prehrano in tako pokriti njihove potrebe po makro- in mikrohranilih za 14 dni.

**Metode:** Primerjali smo, kako se razlikujeta zalogi hrane za štiričlansko družino za 14 dni uravnoteženega prehranjevanja, v razmerah, kot smo jih občutili v času epidemije covid-19, in v izrednih stanjih (npr. potres, poplave ...), ko je krajše obdobje potrebna popolna samooskrba. Pripravili smo prehranski načrt za štiričlansko družino. Poskušali smo ga praktično izpeljati za primer epidemije covid-19 in za primer nenadnih izrednih razmer. Izredno stanje zajema izpad elektrike, plina, telekomunikacij in vode v gospodinjstvu, prekinjene so trgovske poti, družina je odvisna le od svojih zalog. V načrt smo tako vključili le živila s podaljšanim rokom trajanja, ki jim za shranjevanje zadošča že hladnejši prostor, kot je klet.

**Rezultati:** Prehranski načrt povprečne družine je seštevek prehranskih načrtov matere, očeta, najstniške hčere in predšolskega sina. Prehrano smo načrtovali skladno s priporočili varovalne prehrane. Iz prehranskega načrta z enotami posameznih skupin živil za vsakega družinskega člana smo pridobili količine posameznih živil in pripravili nakupovalni seznam za 14 dni. Praktično uporabnost zaloge smo v praksi preverili z izdelavo 14-dnevnih jedilnikov za obe obdobji izrednih razmer. Preverili smo skladnost jedilnikov z načeli uravnotežene prehrane. Zanimala sta nas tudi strošek takega nakupa in skladnost naše zaloge s trenutnimi priporočili za mesečno zalogo hrane Uprave Republike Slovenije za zaščito in reševanje.

**Diskusija:** V razmerah, ki so nastale v času epidemije covid-19, ko je bil dostop do hrane omogočen, je sledenje načelom varovalne uravnotežene prehrane ob vnaprejšnjem načrtovanju izvedljivo. V bolj ekstremnih izrednih razmerah, kjer prevladuje prehranjevanje s konzerviranimi živili, pa je oteženo in cenovno manj ugodno. Pojavijo se odstopanja zlasti v vnosu sladkorjev in soli ter nekaterih mikrohranilih. Zato je ob zalogi hrane smiselno shranjevati tudi nekatera prehranska dopolnila.

**Ključne besede:** prehranska avtonomija, dnevna košarica, zaloga hrane, izredno stanje

## Family food autonomy in extraordinary circumstances

*Petra Vodopivec Kolar, Irena Hren*

*General hospital of Novo mesto, Šmihelska cesta 1, 8000 Novo mesto, Slovenia*

**Introduction:** Given the current events during the Covid-19 epidemic, we were interested in what the family's food supply would be like if they wanted to provide a balanced diet for all family members and thus cover their needs for macro- and micronutrients for 2 weeks.

**Methods:** We wanted to discover how food supplies for a family of four members for 2 weeks differ from those in other more extraordinary circumstances (e.g. earthquake, flood ...), when complete self-sufficiency is needed. We prepared a diet plan for a family of four and tried to implement it practically in case of Covid-19 epidemic and in case of a sudden emergency. The state of emergency includes power, gas, telecommunications and water outage in the household, trade routes are interrupted, and the family depends only on its own supplies. Thus, we only included foods with an extended shelf life in the plan, for storage of which a cooler space, such as a cellar, is sufficient.

**Results:** The average family's diet plan that we prepared consists of separate diet plans for mother, father, teenage daughter, and preschool son. The diet was planned in accordance with healthy balanced diet recommendations. From the diet plan with units of individual food groups for each family member, we obtained the quantities of individual foods and prepared a shopping list for 2 weeks. The practical usability of the stock was tested by making 2-week meal plan for both periods of emergency. We checked the compliance of the meal plan with the principles of a balanced diet. We were also interested in the cost of such purchase and the compliance of our stock with the current recommendations for the monthly food stock of the Administration of the Republic of Slovenia for Protection and Rescue.

**Discussion:** In the circumstances given in epidemic Covid-19, when the access to food was enabled, it is feasible to follow the principles of balanced diet, while in more extreme emergencies, where eating canned foods predominates, it is difficult and less affordable. Deviations occur especially in intake of sugar and salt and some micronutrients. Therefore, it is recommended to store some food supplements along with other food.

**Key words:** food autonomy, food supply, extraordinary circumstances

## Energijska bilanca pri slovenskih policistih

Jure Žitnik<sup>1,2</sup>, Kaja Kastelic<sup>3,1</sup>, Nastja Podrekar<sup>1,2</sup>, Nejc Šarabon<sup>2,1</sup>

<sup>1</sup> InnoRenew CoE, Zdravje v grajenem okolju, Livade 6, 6310 Izola, Slovenija

<sup>2</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

<sup>3</sup> Univerza na Primorskem, Inštitut Andrej Marušič, Muzejski trg 2, 6000 Koper, Slovenija

**Uvod:** Delo policistov vključuje izmensko in nočno delo ter od policistov zahteva različno stopnjo telesne dejavnosti. Nekateri policisti opravljajo pretežno sedeče delo, medtem ko drugi opravljajo delo, ki zahteva višjo stopnjo telesne dejavnosti. Izmensko delo je povezano z nezdravim življenjskim slogom, vključujoč telesno nedejavnost in nezdrave prehranjevalne navade. Namen raziskave je bil preučiti stanje energijske bilance pri slovenskih policistih ter primerjati policiste, ki opravljajo pretežno sedeče delo in policiste, ki opravljajo delo, ki zahteva višjo stopnjo telesne dejavnosti.

**Metode:** V okviru lokalnega projekta PROZ-SIPO je bilo prvotno v raziskavo vključenih 57 policistov. Preiskovanci so opravili 10-dnevno objektivno vrednotenje telesne dejavnosti z uporabo pospeškometra, vrednotenje telesne sestave, bazalne presnove in vrednotenje prehranskega vnosa. V končno analizo je bilo vključenih 29 preiskovancev ( $42,6 \pm 6,6$  let; 23 moških, 6 žensk), ki so bili razdeljeni v dve skupini glede na vrsto delovnega mesta, ki ga opravljajo – pretežno sedeče ( $n = 12$ ) ali manj sedeče ( $n = 17$ ). Za analizo so bile uporabljene metode opisne statistike in t-test za neodvisna vzorca.

**Rezultati:** Povprečna celodnevna energijska poraba (TDEE) je znašala  $2972 \pm 517$  kcal in povprečni celodnevni energijski vnos (EI)  $2575 \pm 491$  kcal. Analiza ni pokazala statistično značilnih ( $p > 0,05$ ) razlik med skupinama pri vrednostih TDEE ( $2951 \pm 626$  proti  $2987 \pm 445$  kcal), EI ( $2563 \pm 646$  proti  $2583 \pm 368$  kcal) in vrednosti energijske bilance ( $-390 \pm 543$  proti  $-405 \pm 374$  kcal). Statistično značilna razlika se je pokazala pri povprečni vrednosti PAL, ki je v skupini, ki opravlja pretežno sedeče delo, znašala  $1,55 \pm 0,02$ , v skupini, ki opravlja manj sedeče delo, pa  $1,66 \pm 0,03$  ( $p = 0,03$ ).

**Razprava in zaključek:** V raziskavi smo ugotovili, da je pri večini policistov stanje energijske bilance negativno ne glede na stopnjo telesne dejavnosti na delovnem mestu. Verjeten razlog za opaženo negativno energijsko bilanco bi lahko bilo nezadostno poročanje prehranskega vnosa, na kar bi lahko imela vpliv težnja po poročanju socialno zaželenega obnašanja, ki je zaradi sočasnega objektivnega vrednotenja telesne dejavnosti morda bila še bolj izražena. Predlagamo, da se v prihodnjih raziskavah preuči načine za zmanjšanje nezadostnega poročanja prehranskega vnosa.

**Ključne besede:** izmensko delo, energijska poraba, telesna dejavnost, energijski vnos

## Energy Balance in Slovenian Police Officers

Jure Žitnik<sup>1,2</sup>, Kaja Kastelic<sup>3,1</sup>, Nastja Podrekar<sup>1,2</sup>, Nejc Šarabon<sup>2,1</sup>

<sup>1</sup> InnoRenew CoE, Human Health in the Built Environment, Livade 6, 6310 Izola, Slovenia

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

<sup>3</sup> University of Primorska, Andrej Marušič Institute, Muzejski trg 2, 6000 Koper, Slovenia

**Introduction:** Police officers have a variable work schedule which includes shift and night work. While some police officers engage in predominantly sedentary work, others perform work that requires a higher level of physical activity. Shift work is associated with increased risk of adopting an unhealthy lifestyle, such as physical inactivity and unfavourable dietary habits. The aim of this study was to investigate energy balance in Slovenian police officers who engage in predominantly sedentary work compared to officers who engage in work requiring higher levels of physical activity.

**Methods:** Fifty-seven Slovenian police officers participated in a regional PROZ-SIPO project. Participants went through a 10-day objective monitoring of physical activity with an accelerometer. Dietary intake was also assessed in addition to body composition and basal metabolic rate. Twenty-nine participants ( $42.6 \pm 6.6$  years; 23 male, 6 female) were included in the final analysis and further divided into two groups, based on the type of work performed – predominantly sedentary ( $n = 12$ ) group or less sedentary ( $n = 17$ ) group. Descriptive statistics were computed in addition to independent t-test calculation that was used for between group data comparison.

**Results:** Total daily energy expenditure (TDEE) was  $2972 \pm 517$  kcal and total daily energy intake (EI) was  $2575 \pm 491$  kcal. There were no statistically significant differences ( $p > 0.05$ ) in TDEE ( $2951 \pm 626$  vs.  $2987 \pm 445$  kcal), EI ( $2563 \pm 646$  vs.  $2583 \pm 368$  kcal) and energy balance ( $-390 \pm 543$  vs.  $-405 \pm 374$  kcal) between groups while the difference in PAL was found to be statistically significant ( $1.55 \pm 0.02$  vs.  $1.66 \pm 0.03$ ;  $p = 0.03$ ).

**Discussion and conclusion:** We found a predominantly negative energy balance in police officers regardless of their workplace activity. A probable reason for observed negative energy balance could be underreporting of dietary intake resulting in lower reported total daily energy intake. The underreporting could be influenced by social desirability bias in participants further exacerbated by objective monitoring of physical activity. Further studies should investigate how to minimize risk of dietary underreporting.

**Key words:** shift work, energy expenditure, physical activity, energy intake



## **Sekcija/Section**

**Uporaba IKT na področju zdravja delovno  
aktivne populacije**

**Use of information and communication  
technologies in health of the working-age  
population**

---

## Vabljeno predavanje Invited lecture

### Izbira je preprosta, z mobilno aplikacijo “Veš, kaj ješ?”

Anja Bolha, Nika Kremlj

Zveza potrošnikov Slovenije, Tržaška cesta 2, 1000 Ljubljana, Slovenija

Mobilna aplikacija “Veš, kaj ješ?” z barvnim kodiranjem prehranske sestave predpakiranih živil, ki so na voljo na slovenskem trgu, podpira informirano izbiro. Aplikacija je bila razvita v sodelovanju med Inštitutom Jožef Stefan, Inštitutom za nutricionistiko in Zvezo potrošnikov Slovenije v okviru projekta Deklaracija = Informacija, ki ga podpira Ministrstvo za zdravje RS. Potrošnikom olajša zdravo izbiro, prav tako pa spodbuja proizvajalce, da obstoječe živilske izdelke preoblikujejo v prehransko bolj ustrezne. Kot so pokazale naše prejšnje raziskave, potrošniki podatke o sestavi živil pogosteje uporabljajo, če so predstavljeni na enostavnejši in razumljivejši način. V aplikaciji so podatki o hranilih obarvani z barvami semaforja, ki na nazoren način prikažejo vsebnost sladkorja, soli, maščob in nasičenih maščobnih kislin v rdeči, oranžni ali zeleni barvi, odvisno od količine v 100 gramih (mililitrih) izdelka. Informacije pridobimo z enostavnim skeniranjem črtno koda na izdelku, na prodajnem mestu ali doma. Model baze podatkov je v skladu z globalnimi standardi, kar omogoča lažjo izmenjavo podatkov. V podatkovni bazi je vnesenih že več kot 37.500 živil, a na trgu jih je na voljo še več deset tisoč. Najpomembnejša dejavnost je zato dodajanje izdelkov v bazo in posodabljanje informacij o sestavi. Prehranski strokovnjaki neprestano dodajajo izdelke, pričakujemo tudi aktivno sodelovanje podjetij (proizvajalcev, distributerjev), najpomembnejši pa je prispevek uporabnikov. Če zelenega izdelka še ni v bazi, lahko uporabnik pošlje predlog za vključitev živila v bazo. Aplikacija ima namreč posebno orodje za fotografiranje hrane (zajem ključnih podatkov), ki je povezano z informacijskim centrom, kjer se podatki obdelujejo in vnašajo v bazo podatkov. Če so prikazani podatki napačni, nas lahko uporabniki tudi o tem, obvestijo s posebno funkcijo v aplikaciji. »Veš, kaj ješ?« je brezplačna aplikacija in je na voljo za uporabnike Android ali IOS. Od začetka leta 2019 smo zbrali že več kot 33.000 aktivnih prenosov. Baza podatkov in aplikacija se nenehno nadgrajujeta, kmalu pričakujemo nove funkcije in posodobljene informacije, kot rezultat trenutnega programa v okviru Ministrstva za zdravje.

*Ključne besede:* mobilna aplikacija, “Veš, kaj ješ?”, zdrava izbira, deklaracija, prehranski semafor



## Informed choice is easy with “Veš, kaj ješ?” mobile application

Anja Bolha, Nika Kremlj

Slovene Consumers' Association, Tržaška cesta 2, 1000 Ljubljana, Slovenia

Mobile application “Veš, kaj ješ?” supports informed choice, by colour coding nutritional composition of pre-packaged foods available on Slovenian market. “Veš, kaj ješ?” was developed as a collaboration between Jožef Stefan Institute, Nutrition Institute and Slovene Consumer's Association, as a part of project Declaration=Information, and is supported by Ministry of Health RS. It helps consumers making the healthy choice the easiest choice, and also encourages producers to reformulate existing food products into changing their composition. As our previous research has shown, consumers use food composition data more often if they are presented in a simpler and more understandable way. In this application nutritional data is coloured with traffic light colours, simply presenting nutritional values for sugars, salt, fat and saturated fatty acids in red, orange or green, depending on the amount in 100 grams (millilitres) of product. Information is accessible by simply scanning the barcode on the product at the point of sale or at home. The database model is in line with global standards, facilitating the exchange of data. There are more than 37.500 foods already in the database, but tens of thousands are available on the market, and our aim is to include as many as possible. The most important activity is adding to the database and updating the composition information. Food products are being constantly added by nutrition experts, we also expect active involvement of companies (manufacturers, distributors), but the most important is user's contribution. If the desired product is not already in the database, the user can send a proposal to include food in the database. Application has a special food photography tool (key data capture) that is connected to information centre where data is processed and entered into the database. If the displayed information is incorrect, users can also let us know via a special feature in the app.

“Veš, kaj ješ?” is free and available for Android or IOS users, there are already more than 33.000 active downloads since the launch in 2019. Database as well as the application are being constantly upgraded and some new features and updated information are expected soon, as a result of an ongoing programme, supported by Ministry of health.

*Key words:* mobile application, “Veš, kaj ješ?”, healthy choices, declaration, dietary traffic light

## Uporaba informacijsko telekomunikacijske tehnologije pri osebah z astmo

Tilen Dolinar, Lidija Jakupovič, Urška Ugovšek, Andrej Starc  
Univerza v Ljubljani, Zdravstvena fakulteta, Zdravstvena pot 5, 1000 Ljubljana, Slovenija

**Uvod:** Astma, kronična bolezen dihalnih poti, za katero so značilni respiratorni simptomi, prizadene približno 235-334 milijonov ljudi po vsem svetu. Je ena izmed najpogostejših pljučnih boleznih pri odraslih. Kljub širokemu učinkovitemu zdravljenju, ki obstaja desetletja, ima večina bolnikov z astmo še vedno nenadzorovane simptome. Informacijsko komunikacijska tehnologija v uporabi v zdravstvu bi lahko izboljšala samoupravljanje raznih kroničnih boleznih. Zlasti aplikacije za mobilno zdravje bi lahko omogočile poceni in klinično učinkovite ukrepe za nadzor astme.

**Metode:** Uporabili smo deskriptivno metodo dela s pregledom slovenske in tuje literature, tako znanstvene kot strokovne. Iskanje literature je potekalo od aprila 2020 do maja 2020. Starost literature je bila omejena od leta 2010 do 2020. Literatura je bila iskana v podatkovnih bazah CochraneLibrary, CINAHL, PubMed in MedNar s pomočjo ključnih besed: information and communication technology, asthma, self-management, chronic illness, application. Pri iskanju slovenske literature s kombinacijo naslednjih ključnih besed: informacijsko komunikacijska tehnologija, astma, samoupravljanje, kronična bolezen, aplikacija. Uporabili smo operator AND oziroma IN. Kriterij izbora je bil dostopnost besedila v celoti in literatura objavljena v obdobju od leta 2010 do 2020. Izključeni so bili članki, ki nimajo popolne strukture članka, članki, ki se ne navezujejo na temo astme. Pregledanih je bilo 16 člankov, od tega je bilo 8 člankov izključenih. **Rezultati:** Mobilne aplikacije obetajo izboljšanje vedenja pri bolnikih z astmo s pomočjo samoupravljanja, saj jih je mogoče enostavno vključiti v vsakdanje življenje. Pametne mobilne naprave imajo veliko prednosti, ene izmed teh so, da so ponavadi vedno pri roki, so prenosne, imajo možnost povezave z drugimi napravami, so cenovno dostopne in računsko zmogljive. Raziskovalci poročajo, da je približno 2/3 bolnikov izrazilo zanimanje za uporabo aplikacije za obvladovanje astme, in sicer za izboljšanje oprijema inhalatorjev, kar je dobro znana težava med bolniki z astmo. Trenutno aplikacije na mobilnih napravah bolnikom omogočajo spremljanje in obvladovanje boleznih, pridobivanje podatkov, izobraževanje o bolezni in izboljšanje zdravstvenega vedenja. Poleg aplikacij bi lahko v uporabo vključili tudi pametne inhalatorje, ki izboljšujejo bolnikovo kakovost življenja.

**Razprava in zaključek:** Glede na to, da kronične bolezni predstavljajo kar 75 % stroškov zdravstvene oskrbe, je ključnega pomena določiti preprosta orodja za pomoč bolnikom pri njihovi oskrbi in izboljšanju rezultatov. Informacijsko komunikacijska tehnologija v zdravstvu bi se lahko uporabljala tudi pri drugih kroničnih boleznih, saj je razmeroma stroškovno učinkovita in lahko pomembno vpliva na izboljšanje obvladovanja kroničnih boleznih. Informacijsko komunikacijska tehnologija lahko izboljša nadzor astme in kakovost življenja astmatikov.

**Ključne besede:** informacijsko komunikacijska tehnologija, astma, samoupravljanje, kronična bolezen, aplikacija

## Use of information telecommunications technology in asthma subjects

*Tilen Dolinar, Lidija Jakupović, Urška Ugovšek*

*University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5, 1000 Ljubljana, Slovenia*

**Introduction:** Asthma, a chronic respiratory disease characterized by respiratory symptoms, affects approximately 235-334 million people worldwide. It is one of the most common pulmonary diseases in adults. Despite extensive effective treatment that has existed for decades, most asthma patients still have uncontrolled symptoms. Health information and communication technology has been used in healthcare to persuade the self-management of various chronic diseases. In particular, mobile health applications could provide inexpensive and clinically effective asthma control measures.

**Methods:** We used a descriptive method of research with a review of Slovene and foreign literature, both scientific and professional. The literature search was conducted from April 2020 to May 2020. The age of the literature was limited from 2010 to 2020. The literature was searched in the CochraneLibrary, CINAHL, PubMed and MedNar databases using *Key words:* information and communication technology, asthma, self-management, chronic illness, application. In the search for Slovenian literature with a combination of the following *Key words:* information and communication technology, asthma, self-management, chronic disease, application. We used the AND and IN operator, respectively. The selection criterion was the availability of the text in its entirety and the literature published in the period from 2010 to 2020. Articles that do not have a complete article structure, articles that do not relate to the topic of asthma were excluded. 16 articles were reviewed, of which 8 articles were excluded. **Results:** Mobile applications promise to improve behavior in asthma patients through self-management, as they can be easily integrated into everyday life. Smart mobile devices have many advantages, one of which is that they are usually always on hand, are portable, have the ability to connect to other devices, are affordable and computationally powerful. Researchers report that about 2/3 of patients have expressed interest in using an asthma management app to improve the inhaler grip, a well-known problem among asthma patients. Currently, mobile applications allow patients to monitor and manage their illness, obtain data, educate about the disease, and improve their health behavior. In addition to applications, smart inhalers could be put into use that improve the patient's quality of life and limit the excess use of health care.

**Discussion and conclusions:** Chronic diseases account for as much as 75 % of healthcare costs, for it is crucial to find simple tools to help patients care for them and improve outcomes. Information and communication technology in healthcare could be used in other chronic diseases, as they are relatively cost effective and can have a significant impact on improving chronic disease management and human health. Information and communication technology can improve asthma control and the quality of life of asthmatics.

*Key words:* information and communication technology, asthma, self-management, chronic illness, application

## Uporaba mobilne tehnologije v zdravstvu

*Grega Martin Glas, Sara Hafner, Špela Rozman, Andrej Starc  
Univerza v Ljubljani, Zdravstvena fakulteta, Zdravstvena pot 5, 1000 Ljubljana,  
Slovenija*

**Uvod:** Raziskave kažejo, da IKT (Informacijsko Komunikacijska Tehnologija) kaže velik potencial v zagotavljanju boljših zdravstvenih storitev. V zadnjem desetletju je postala tehnologija pametnih telefonov zelo sofisticirana in vseprisotna v življenju ljudi. Zagotavlja set orodij, ki pripomorejo k odnosu zdravstveni delavec – pacient. Razvilo se je mnogo mobilnih aplikacij, med katerimi so lahko nekatere potencialno uporabne v kontekstu skrbi za zdravje. Namen pregleda literature je bil predstaviti uporabnost mobilnih naprav v zdravstvu.

**Metode:** Uporabljena je bila deskriptivna metoda s kritičnim pregledom znanstvene in strokovne literature, v podatkovnih zbirkah ScienceDirect, CINAHL with Full Text, MEDLINE in Google učenjak. Uporabljene so bile ključne besede z uporabo Boolovih operaterjev AND in OR: smart phones, mobile technology, healthcare. Vključitveni kriteriji so bili članki, objavljeni med leti 2014 in 2020, prosto dostopna in primarno recenzirana literatura, z jasno opredeljenimi cilji in metodami, v angleškem jeziku. Pregled literature je zajemal 15 virov, tisti, ki so bili izključeni, niso ustrezali našim vključitvenim kriterijem. Pregled literature je potekal v februarju in marcu 2020. Podatki so bili analizirani z metodo vsebinske analize.

**Rezultati:** Rezultati so pokazali, da lahko mobilna tehnologija predstavlja korist tako pacientom kot tudi zdravstvenim delavcem. Pacientom služi kot pripomoček pri dnevni opravih za bolj zdravo življenje ali za lažje spopadanje s kroničnimi boleznimi. Mobilna tehnologija lahko pacientu omogoči, da prevzame večji nadzor nad svojim zdravstvenim stanjem. Pri zdravstvenih delavcih predstavlja dodatne in drugačne možnosti za učenje ali pa je uporabljena kot dodatno sredstvo pri v pacienta usmerjeni obravnavi. Uporaba mobilne tehnologije v zdravstvu lahko vpliva na komunikacijo in odnos med pacienti in zdravstvenimi delavci, hkrati pa premaguje jezikovne ovire in razdaljo. Njena implementacija ima pozitiven učinek na paciente, kar kaže, da so pripravljene na prehod s tradicionalnih kliničnih pristopov na modernejše načine zdravstvene obravnave. Kljub temu, sta pri implementaciji novih tehnologij v zdravstvu, potrebna previdnost in profesionalna perspektiva, ki temeljita na znanju in etičnih pomislekih.

**Diskusija in zaključek:** Uporaba mobilne tehnologije in mobilnih zdravstvenih intervencij se je močno povečala. Kljub temu, da imajo intervencije s pomočjo mobilne tehnologije potencial, da izboljšajo izide zdravljenja, se še vedno kažejo izzivi, povezani z novimi tehnologijami, ki jih moramo vzeti v premislek. Vrednotenje novih mobilnih zdravstvenih sistemov je potrebno za razumevanje različnih dejavnikov, ki vplivajo na razvojni proces s tehničnega in človeškega vidika. Kaže se potreba po študijah z različnimi raziskovalnimi pristopi in uporabniki na področju mobilne tehnologije, da se oceni njihova učinkovitost.

**Ključne besede:** pametni telefoni, mobilna tehnologija, IKT, zdravstveno varstvo

## Use of mobile technology in healthcare

*Grega Martin Glas, Sara Hafner, Špela Rozman, Andrej Starc  
University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5,  
1000 Ljubljana, Slovenia*

**Introduction:** It has been shown that ICT (Information Communication Technology) has the potential to provide better healthcare services. In the last decade, mobile technology has become very sophisticated and widely spread among people. It provides a new set of tools to improve the health professional – patient relationship. There have been developed many mobile applications that may be potentially useful for healthcare purposes. The literature review is aimed to present the role of mobile technology in healthcare.

**Methods:** A descriptive research method with critical review of English scientific and professional literature was performed, using ScienceDirect, CINAHL with Full Text, MEDLINE and Google Scholar. The keywords with the use of Bool's operators AND and OR were: smart phones, mobile technology, healthcare. Literature inclusion criteria were articles published between 2014 and 2020, freely accessible and primary reviewed articles with clearly defined objectives and methods in English language. We reviewed 15 articles, the excluded ones did not match our inclusion criteria. The literature search took place in February and March 2020. Data were analyzed using content analysis method.

**Results:** The results showed that mobile technology can benefit patients as well as healthcare professionals. Patients can use them as devices that help performing daily tasks for healthier life or easier management of chronic diseases. Mobile technology can empower the patients, so they can take control over their health condition. Healthcare professionals can use it for additional or different learning options or as a tool in patient-centered care. The use of mobile technology can influence communication and relationship between patients and healthcare professionals, also, it breaks down barriers, such as language and long distance. Adopting mobile health technology perceived an overall positive impact among patients, indicating they are ready to transition from traditional clinical encounters to modern treatment ways. Nevertheless, caution and professional perspective based on knowledge and ethical considerations are needed when implementing new technology in healthcare.

**Discussion and conclusions:** The use of mobile technology and mobile health interventions has increased significantly. Even though mobile phone based interventions have the potential to improve treatment outcomes, there are still challenges relating new technologies that must be taken into consideration. To be able to understand how different factors affect the development process from a technical and human perspective there is a need for evaluation of mobile technology. It is necessary to conduct more studies with greater variety in research design and users on mobile applications to evaluate their effectiveness.

**Key words:** smartphones, mobile technology, ICT, healthcare

## STAR-VITAL WIKI: Repozitorij ukrepov promocije zdravja na delu

Urška Jerman<sup>1</sup>, Klemen Širok<sup>2</sup>

<sup>1</sup> Univerza na Primorskem, Fakulteta za management, Cankarjeva 5, 6000 Koper, Slovenija

<sup>2</sup> Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** V Sloveniji staranje prebivalstva – in posledično tudi delovne sile postavlja delodajalce in zaposlene pred številne izzive. Osrednji izziv predstavlja podaljševanje delovne aktivnosti, pri čemer raziskave opozarjajo na nezadovoljstvo delavcev z delovnimi razmerami, kar pogosto vodi v nepripravljenost na podaljševanje delovno aktivnega obdobja. Poznanih smernic in ukrepov za varovanje in promocijo zdravja na delovnih mestih je veliko, vendar je obstoječa ponudba vsebin razpršena, nesistematična in necelovita. Način, kako so informacije zbrane in ponujene končnemu uporabniku (tj. delodajalec) je v danem kontekstu (časovna omejenost, spremenjeni načini komuniciranja in spremenjene navade branja), nezadovoljiv. V prispevku predstavljamo STAR-VITAL Wiki, ki služi kot rešitev na zaznan problem in predstavlja pomoč podjetjem in vodstvenim strukturam pri implementaciji ukrepov varovanja in promocije zdravja.

**Metode:** Enciklopedije so historično gledano ene prvih oblik organizacije znanja, ki s celovitim pregledom uporabniku omogočajo pridobitev informacij z različnih področij. V skladu z modernimi načini komuniciranja ter komunikacijskimi navadam in praksami, smo vzpostavili Wikipediji podobno spletno rešitev z namenom, da bi uporabnikom olajšali proces pregledovanja, iskanja in seznanjanja s potencialno zanimivi ukrepi s področja varovanja in promocije zdravja. STAR-VITAL Wiki poleg bolj sistematičnega dostopa do informacij, zasleduje tudi ambicijo, da sistematično popiše vse poznane in javno dostopne ukrepe. Baza ukrepov predstavlja nadgradnjo marsikaterega predhodnega poizkusa, saj na enem mestu uporabniku omogoča pregled pestrega nabora ukrepov.

**Rezultati:** Sistematičen pregled obstoječih javno dostopnih virov in izkušnje pri delu s podjetji v okviru projekta STAR-VITAL so pokazale da: (1) delodajalci potrebujejo tovrstne informacije, (2) je obstoječa ponudba teh vsebin zelo razpršena, nesistematična, necelovita in redundantna. (3) Prav tako so viri, ki naslavlajo to tematiko neizčrpní (viri so splošni ali si zelo podrobni), posledično so dostopne informacije za delodajalca nezadovoljive in pogojno uporabne. Predvsem pa delodajalci zaradi časovne omejenosti, spremenjenih načinov komuniciranja in navad branja, tovrstnih vsebin ne berejo.

**Razprava in zaključek:** STAR-VITAL Wiki je rešitev, ki uporabniku omogoča hitro in celovit pregled vsebin ter ukrepov na enem mestu. Rešitev ima sledeče prednosti. Omogoča sistematičen pregled ukrepov, organiziranih po modelu Svetovne zdravstvene organizacije. Obstoječo bazo se lahko zelo hitro širi in pogloblja, pri čemer so ukrepi predstavljeni po enotnem ključu: splošen opis in predstavitev primera dobre prakse s poudarkom na podrobnostih, ki so ključni za uspešno implementacijo. Opisi ukrepov sledijo sodobnim smernicam komunikacije preko svetovnega spleta in mobilnih naprav, pri čemer smo posebno pozornost namenili uporabniku prijaznim načinom iskanja informacij (iskalnik, drevesna struktura vsebin, pojmovne oznake).

**Ključne besede:** delovno mesto, dobro počutje, ukrepi, wiki, promocija zdravja

## STAR-VITAL WIKI: workplace well-being measures repository

Urška Jerman<sup>1</sup>, Klemen Širok<sup>2</sup>

<sup>1</sup> University of Primorska, Faculty of Management, Cankarjeva 5, 6000 Koper, Slovenia

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** The population aging and, consequently, the workforce ageing in Slovenia – brought many challenges to employers and employees. The main challenge is the prolongation of work activity, whereby research clearly shows the workers' dissatisfaction with working conditions that in turn often leads to a reluctance to extend their work life. There are many known workplace health-promotion (well-being) guidelines and measures. However, the existing content offering is fragmented, unsystematic and incomplete. The way information is collected and offered to the end user (i.e. employer) is unsatisfactory in a given context (time constraints, changed communication and reading habits). This article introduces the STAR-VITAL Wiki, which serves as a solution to a perceived problem and helps companies and management to implement measures in the field of workplace well-being.

**Methods:** Encyclopaedias have historically been one of the first forms of knowledge organization, enabling users to find and obtain relevant information from a specific field. In accordance with modern communication methods, communication habits and practices we set up a Wikipedia-like online solution to help users browse, search and learn about workplace well-being measures. In addition to more systematic access to information the STAR-VITAL Wiki also pursues the ambition to systematically list all known and publicly available tools, actions and interventions, thus representing an improvement of many other existing attempts.

**Results:** A systematic review of existing publicly available resources and experience with companies under the STAR-VITAL project have shown that: (1) employers need this type of information, (2) the existing supply of these content is highly fragmented, non-systematic, incomplete and redundant. (3) The sources addressing the topic of workplace well-being are also incomprehensible (the sources are general or very detailed). This in turn makes the information available to the employer unsatisfactory and conditionally useful. Above all, due to time constraints, changed communication and reading habits, employers seldomly read such content.

**Discussion and conclusions:** The STAR-VITAL Wiki is a solution that allows users quick and comprehensive review of workplace well-being tools, actions and interventions collected in one place. The solution brings the following advantages. It provides a systematic overview of measures organized according to the World Health Organization model. The existing database can be extended and supplemented easily, whereby the information is presented using uniform structure: a general description and a description of a good practice focusing on details that are crucial for successful implementation. The descriptions and presentations follow the contemporary guidelines of communication via WWW and mobile devices, with particular attention to user-friendly ways of finding information (search engine, content tree structure, tags).

**Key words:** workplace, well-being, measures, wiki



## SLOfit zaVse

Gregor Jurak, Bojan Leskošek, Gregor Starc

Univerza v Ljubljani, Fakulteta za šport, Gortanova 22, 1000 Ljubljana, Slovenija

Izhodišča in namen: Zaradi sprememb v življenjskem slogu, zlasti zaradi povečanja telesne nedejavnosti, so kardiovaskularne bolezni (KVB) postale vodilni vzrok smrtnosti v 21. stoletju. Eden najpomembnejših dejavnikov tveganja za KVB je nizek telesni fitness. Poleg tega izboljšanje telesnega fitnessa pozitivno vpliva na duševno zdravje in izboljšuje kakovost življenja, zato je le-ta pomemben pokazatelj zdravja skozi vse življenje. Ameriško združenje za srce je pred kratkim priporočilo, da se telesni fitness vključi med vitalne znake, ki so zabeleženi med vsakim obiskom pri zdravniku, Slovenija pa ima zaradi svoje tradicije spremljanja telesnega fitnessa izjemno priložnost, da kot prva država na svetu naredi nacionalni sistem vseživljenjskega spremljanja telesnega fitnessa.

Predstavitev vsebine: V prispevku bomo predstavili arhitekturo spletne aplikacije SLOfit zaVse, s katero želimo vseživljenjsko spremljati telesni fitness in nekaterih s telesno dejavnostjo povezanih dejavnikov tveganja za zdravje, kar nam bo omogočilo preučevanje vzročnih povezav med telesnim fitnessom pri otrocih in mladostnikih ter zdravstvenimi izidi v odrasli dobi na slovenski populaciji. Gre za nadgradnjo sistema in spletne aplikacije SLOfit, ki predstavlja nadaljevanje nacionalnega sistema za spremljanje telesnega in gibalnega razvoja šolajočih se otrok in mladine, znanega kot Športnovzgojni karton. SLOfit je vzpostavil kohorte za 13 let šolanja posameznika (starost 6-19 let), vpogled v te rezultate prek spletne aplikacije za starše, učitelje in pooblaščen osebe (npr. zdravnike), enostaven vnos podatkov s pametnimi algoritmi čiščenja podatkov, poročilne sisteme za šolo in posameznika z ovrednotenim zdravstvenim tveganjem in možnost trajnega hranjenja teh podatkov. Načrtovana aplikacija SLOfit zaVse bo uporabnikom ponudila podobne značilnosti kot osnovna aplikacija, pri čemer so kot uporabniki mišljeni odrasli prebivalci Slovenije ter štiri skupine izvajalcev diagnostike telesnega fitnessa in vadbenih programov: fakultete, zdravstvene organizacije, osnovne šole in športne organizacije.

Sklepne ugotovitve: Poleg vrednosti za končne uporabnike bo imela aplikacija tudi pomembno raziskovalno vrednost. Razvoj aplikacije namreč sodi v raziskovalni projekt SLOfit vseživljenje, s katerim bomo oblikovali edinstveno raziskovalno platformo za preučevanje napovedne veljavnosti z zdravjem povezanega telesnega fitnessa pri mladih. Vsako leto bo v sistem vstopila nova kohorta, kar bo omogočilo nenehen pritok novih podatkov in nam omogočilo oblikovanje eno največjih kohortnih infrastruktur na svetu. Preučevanje povezanosti podatkov o telesnem fitnessu, zdravstvenih izidih in s telesno dejavnostjo povezanih dejavnikov tveganja za zdravje pa nam bo omogočilo uporabo epigenetskega pristopa pri preučevanju razmerja med telesnim fitnessom in zdravstvenimi izidi.

*Ključne besede:* telesna zmogljivost, fitness, zdravstveno tveganje, aplikacija, spremljanje, napovedovanje, odrasli



## SLOfit forAll

*Gregor Jurak, Bojan Leskošek, Gregor Starc  
University of Ljubljana, Faculty of Sport, Gortanova 22, 1000 Ljubljana, Slovenia*

**Background and purpose:** Due to lifestyle changes, especially because of increase in physical inactivity, cardiovascular diseases (CVD) became the leading cause of global mortality in the 21<sup>st</sup> century. Among the most important CVD risk factors is low physical fitness. Moreover, improvement in physical fitness positively affects mental health<sup>10</sup>, and improves quality of life, therefore, physical fitness is clearly an important marker of health throughout life. American Heart Association has recently recommended to include physical fitness among vital signs that are recorded during every visit to a physician. Due to its tradition of physical fitness monitoring, Slovenia has a tremendous opportunity to create, as the first country in the world, a national system of lifelong physical fitness monitoring.

**Content:** We will present the architecture of the online application SLOfit forAll, with which we wish to establish lifelong monitoring of physical fitness and some of the physical activity-related health risk factors, which will allow us to study the causality between physical fitness in children and adolescents and health outcomes in adulthood in Slovenian population. It is an upgrade of the SLOfit system and web app, which is a continuation of the national system for surveillance the physical and motor development of schoolchildren and adolescent, known as the Sport Educational Chart. The SLOfit has established cohorts for 13 years of individual education (ages 6-9), insight into these results through an online application for parents, teachers and authorized persons (eg physicians), easy data entry with smart data cleaning algorithms, school report and an individual feedback with evaluated health risk and the ability to permanently store that information. The planned SLOfit for all app will offer users similar features to the basic app, targeting adult users as well as four groups of organizations diagnosing physical fitness and performing exercise programs: faculties, health organizations, primary schools and sports organizations.

**Conclusions.** In addition to end-user values, the app will also have significant research value. The development of the app is part of the SLOfit Lifelong research project, which will create a unique research platform for studying the predictive validity of health-related physical fitness in young people. Each year, a new cohort will enter the system, which will allow a constant flow of new data and enable us to create one of the largest cohort infrastructures in the world. Examining the correlation between physical fitness data, health outcomes and physical activity-related health risk factors will allow us to use an epigenetic approach to examine the relationship between physical fitness and health outcomes.

**Key words:** physical fitness, health-risk, app, monitoring, prediction, adults

## Uporaba informacijsko-komunikacijske tehnologije pri srčnih bolnikih

Matej Korošec, Žiga Metelko, Tatjana Somi, Andrej Starc  
Univerza v Ljubljani, Zdravstvena fakulteta, Zdravstvena pot 5,  
1000 Ljubljana, Slovenija

**Uvod:** Z razvojem tehnologije, se je uporaba informacijsko komunikacijske tehnologije (IKT) razširila tudi na področje zdravstva. Z razvojem IKT so se razvijali tudi elektronski srčni vsadki, kot sta srčni spodbujevalnik in kardioverter-defibrilator, kar je prineslo različne prednosti. Ker so te naprave tako sodobne in so postale brezžične, je omočen avtomatski brezžični prenos podatkov iz naprave na računalnik. Omogočeno pa je tudi spremljanje teh naprav na daljavo s pomočjo mobilnih aplikacij. Namen je proučiti, kakšne prednosti prinaša sodobna tehnologija na tem področju.

**Metode:** Uporabljena je bila deskriptivna metoda dela s pregledom domače in tuje literature. Pregled literature je bil izveden v mesecu februarju in marcu 2020. Iskanje je bilo omejeno na časovni okvir objav med letoma 2015 in 2019. Za iskanje literature smo uporabili spletni brskalnik Google Scholar ter podatkovni bazi Medline in CINAHL with full text. Pri iskanju smo se osredotočili na literaturo s področja informacijske komunikacijske tehnologije in elektronskih srčnih vsadkov. Ključne besede, ki smo jih uporabili z uporabo Boolovih operaterjev OR in AND so: elektronski srčni vsadki, sodobna tehnologija, spremljanje na daljavo, srčni bolniki. Ključne besede so bile uporabljene v slovenskem in angleškem jeziku. Uporabili smo 15 različnih virov strokovne literature.

**Rezultati:** Po pregledu literature je bilo ugotovljeno, da se najpogosteje uporabljata srčni spodbujevalnik in kardioverter-defibrilator. Brezžično oddajanje podatkov in spremljanje na daljavo omenjenih naprav prinaša veliko prednosti, ki pa so sledeče: hitrejše zaznavanje aritmij (atrijska fibrilacija, ventrikularna tahikardija), zgodnje odkrivanje napak v napravi, višje zadovoljstvo bolnikov, izboljšanje kliničnih izidov in posledično tudi nižja smrtnost. Zabeležen je zmanjšan obisk v zdravstvenih ustanovah, saj diagnostika poteka na daljavo, posledično pa so zmanjšani tudi stroški bolnišničnih obravnav.

**Razprava in zaključek:** Rezultati kažejo na uporabnost brezžičnih elektronskih srčnih vsadkov in mobilnih aplikacij pri pacientih s srčnimi obolenji, saj prinašajo številne koristi. Pri razvoju aplikacij, ki spremljajo delovanje omenjenih naprav, bi bilo pametno vključiti tudi uporabnike (bolnike), da bi bile aplikacije čim bolj prilagojene njihovim potrebam.

**Ključne besede:** elektronski srčni vsadki, sodobna tehnologija, spremljanje na daljavo, srčni bolniki.

## Use of information and communication technology in cardiac patients

Matej Korošec, Žiga Metelko, Tatjana Somi, Andrej Starc  
University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5,  
1000 Ljubljana, Slovenia

**Introduction:** With the development of technology, the daily use of information and communication technology (ICT) has expanded also in healthcare. With the development of ICT, cardiac implantable devices, like pacemakers and cardioverter-defibrillators, also developed. This development brought different benefits. These devices became so modern and wireless, that automatic wireless data transmission from the device to the computer is enabled. It is also possible to monitor the devices through mobile applications. The purpose is to study the benefits of modern technology in this field.

**Methods:** We used a descriptive research method of work involving review of Slovenian and English literature. The review was carried out in February and March 2020. We used the literature that was published between the years 2015 and 2019. The search for literature was conducted with web browser Google Scholar and in Medline and CINAHL with full text databases. We focused on literature about information and communication technology and cardiac implantable devices. The key words, used with Bool operators OR and AND, were cardiac implantable devices, modern technology, remote monitoring, and cardiac patients. Key words were used in Slovenian and English language. We used 15 different sources of professional literature.

**Results:** After reviewing the literature, it was found that the most commonly used devices are pacemakers and cardioverter-defibrillators. The wireless transmission of data and the remote monitoring of the mentioned devices have many advantages, which are the following: early detection of arrhythmias (atrial fibrillation, ventricular tachycardia), early detection of errors in devices, higher patient satisfaction, improved clinical outcomes and consequently lower mortality. Reduced visits to healthcare facilities have been reported, since the patient's health can be monitored remotely and consequently this reduces the hospital costs.

**Discussion and conclusions:** The results show the usefulness of wireless electronic cardiac implantable devices and mobile applications in cardiac patients, as they bring many benefits. When developing the applications that monitor these devices, it would be wise to involve the users (patients), in order to make them more tailored to their needs.

**Key words:** cardiac implantable devices, modern technology, remote monitoring, cardiac patients.

## Vloga informacijsko komunikacijske tehnologije pri samovodenju sladkorne bolezni tipa 2

*Filip Krajnc, Maruša Magister, Klara Nartnik, Andrej Starc*  
 Univerza v Ljubljani, Zdravstvena Fakulteta, Zdravstvena pot 5,  
 1000 Ljubljana, Slovenija

**Uvod:** Kronične bolezni, kot je sladkorna bolezen tipa 2, predstavljajo hudo breme zdravstvu po celotnem svetu. Uporaba informacijsko komunikacijske tehnologije (IKT) pri samovodenju sladkorne bolezni postaja vse bolj pogosta. Pacientom omogoča učinkovito vodenje bolezni in nadzor nad svojim zdravjem. Tehnološke naprave, kot so računalniki, pametni telefoni in tablice, ter mobilne aplikacije premoščajo časovne in krajevne ovire s spremljanjem podatkov, kot je krvni sladkor, od doma in z vzpostavljanjem komunikacije med pacienti in zdravstvenimi delavci. Raziskave kažejo, da je prevalenca uporabe IKT pri samovodenju sladkorne bolezni tipa 2 kljub številnim koristim nizka.

**Metode:** Uporabljena je bila deskriptivna raziskovalna metoda in sicer sistematični pregled znanstvene literature. V pregled so bile vključene naslednje podatkovne baze: Google Scholar, PubMed, CINAHL in Medline. Napredno iskanje je potekalo s pomočjo Boolovih logičnih operatorjev AND, v kombinaciji ključnih besed: »Patient«, »Type 2 Diabetes«, »Self-management«, »Information and communication technology«. Sistematični pregled literature je bil izveden v prvi polovici marca 2020. Za prikaz odločanja o uporabnosti pregledanih virov je bila uporabljena metodologija PRISMA, v nadaljnjo analizo pa smo izbrali 10 virov.

**Rezultati:** Pacienti s sladkorno boleznijo tipa 2 so na splošno pripravljene uporabljati IKT pri samovodenju svoje bolezni in se zavedajo njenih koristi, kljub temu je prevalenca uporabe IKT še vedno nizka. Najpogostejše ovire pri soočanju z IKT so nepoznavanje uporabe računalnika, pametnega telefona ali mobilnih aplikacij in nevarnost zlorabe osebnih podatkov. Rezultati so pokazali, da uporaba IKT statistično pomembno prispeva k zmanjšanju glikiranega hemoglobina (HbA1c), študije pa se delijo glede statistične pomembnosti pri zmanjšanju telesne mase in indeksa telesne mase (ITM). Pacienti si želijo, da bi IKT vsebovala različne komunikacijske kanale, omogočala možnost izmenjave izkušenj in povezljivost z različnimi zdravstvenimi sistemi ter ponudila pisno in slikovno obliko njihovih informacij o bolezni.

**Razprava in zaključek:** Ker uporaba IKT pri samovodenju sladkorne bolezni omogoča lažje spremljanje bolezni ter zmanjšuje možnost komplikacij, je zaradi hitrega staranja prebivalstva in posledičnega naraščanja kroničnih bolezni, vse bolj potrebna. Tak način vodenja bolezni bo olajšal obravnavo pacientov na podeželju, saj bodo lažje in hitreje dostopali do morebitne zdravstvene pomoči. Zdravstveni delavci pa bodo razbremenjeni nepotrebnih obravnjav in bodo na podlagi stalnega spremljanja pacientov lažje ter hitreje ukrepali preventivno. Razvijanje nove IKT zahteva sodelovanje med zdravstvenimi delavci in strokovnjaki s področja IKT, prav tako pa se je potrebno osredotočiti tudi na želje in potrebe pacientov.

**Ključne besede:** pacient, sladkorna bolezen tipa 2, samovodenje, informacijsko komunikacijska tehnologija

## The role of information and communication technology in self-management of type 2 diabetes

*Filip Krajnc, Maruša Magister, Klara Nartnik, Andrej Starc  
University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5,  
1000 Ljubljana, Slovenia*

**Introduction:** Type 2 diabetes is a chronic disease which represents a substantial burden on healthcare across the world. The use of information and communication technology (ICT) in self-management of diabetes is becoming more common, as it enables effective self-management and control over your health. Technology such as computers, smart phones, tablets and mobile apps can overcome time and location barriers by monitoring data such as blood glucose levels from home and can establish communication between patients and healthcare personnel. Previous studies have shown that despite numerous benefits, prevalence of ICT use in self-management of type 2 diabetes is low.

**Methods:** The descriptive research method with a systematic literature review was used in the following databases: Google Scholar, PubMed, CINAHL and Medline. The search proceeded with the help of Boolean logical operator AND, together with the key words: »Patient«, »Type 2 Diabetes«, »Self-management«, »Information and communication technology«. A systematic literature review was conducted in the first half of March 2020. PRISMA methodology was used to display decisions about usefulness of reviewed sources and ten of those sources were selected for further analysis.

**Results:** Patients with type 2 diabetes are willing to use ICT and are aware of its benefits, but the prevalence remains low. Ignorance about computers, smart phones or more specifically mobile apps and the possibility of personal information breaches are the most common barriers to ICT use. Results show that the use of ICT contributes to a statistically significant reduction of glycated hemoglobin (HbA1c), however studies are divided about the reduction of body weight and body mass index (BMI). Patients want ICT to include different communication channels, enable possibilities for exchanging experiences and connection with different healthcare systems and to offer written and visual individualized information about their disease.

**Discussion and conclusions:** Because the use of ICT enables simpler monitoring of diabetes and reduces the possibilities of complications, its use is becoming ever more necessary, due to the fast ageing population and an increasing rate of chronic disease. This way of self-managing disease will simplify medical treatment for patients living in the countryside because of faster and easier access to medical assistance. In addition, healthcare personnel will be relieved of unnecessary treatment and will be able to take preventative measures faster and more easily through continuous patient monitoring. Developing new ICT for the management of chronic diseases such as type 2 diabetes requires collaboration between healthcare personnel and ICT experts, in addition we must consider the patient's wishes and needs.

**Key words:** patient, type 2 diabetes, self-management, information and communication technology

## Uporaba nadgrajene resničnosti za izobraževanje laične populacije pri temeljnih postopkih oživljanja

*Davorin Marković, Andrej Starc, Neli Kocijančič, Eva Ferjančič*  
Univerza v Ljubljani, Zdravstvena fakulteta Ljubljana, Zdravstvena pot 5, 1000 Ljubljana, Slovenija

Uvod: Informacijsko komunikacijske tehnologije omogočajo povezavo strojne in programske opreme, katere imajo funkcijo zbiranja, posredovanja, obdelovanja in shranjevanja informacij. Namenjene so tako za uporabo v poslovnem svetu in prostem času, kot tudi v izobraževalne namene. Med informacijsko komunikacijske tehnologije spada tudi uporaba nadgrajene resničnosti, ki se uporablja za izobraževanje tako zdravstvenega osebja kot tudi laične populacije. Ta omogoča moderno izkustveno edukacijo, ki pripravi udeležence na resnično situacijo pri obravnavi vitalno ogrožene osebe. Poznavanje temeljnih postopkov oživljanja je zelo pomembno za kolektivno varnost laične populacije.

Metode: Uporabljena je bila metaanaliza s kritičnim pregledom slovenske in angleške strokovne in znanstvene literature z uporabo CINAHL, Medline, ERIC, Google scholar, Cochrane knjižnice in COBIB.SI baze podatkov. Literaturo smo uporabili glede na postavljen kriterij objave literature med leti 2010 in 2020. Vključeni članki obsegajo uporabo tehnologije nadgrajene resničnosti v smeri aplikacije za edukativne namene.

Rezultati: Nadgrajena resničnost ima več pozitivnih učinkov na edukacijo laične populacije in je pomemben dodatek sodobne edukacije. Eden glavnih učinkov je možnost izkustva situacij, ki se v resničnem življenju ne dogajajo vsakodnevno. Zaradi napredka sodobne tehnologije so ta izkustva zelo realistična in pripomorejo k pripravi udeleženca na resnično situacijo, ki zahteva določen nivo znanja, obvladovanja stresa in hitrega ter preudarnega ukrepanja za obravnavo urgentnih stanj.

Razprava in zaključek: Uporaba sodobne tehnologije za namen edukacije je zelo dobrodošla pri edukaciji tako v zdravstvu kot za laično populacijo. Omogoča nam nove ravni edukativnih pristopov in izboljša rezultate izobraževanja. Je pomemben del zagotavljanja kolektivne varnosti v smislu poznavanja temeljnih postopkov oživljanja. Bolj kot je laična populacija izobražena v smeri temeljnih postopkov oživljanja, večja je splošna varnost in s tem seveda se povečuje možnost preživetja v primeru urgentnih stanj.

*Ključne besede:* nadgrajena resničnost, edukacije, temeljni postopki oživljanja

## Use of augmented reality in education of lay population in basic life support

*Davorin Markovič, Andrej Starc, Neli Kocijančič, Eva Ferjančič*

*University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5, 1000 Ljubljana, Slovenia*

**Introduction:** Information and communication technologies enable the connection of hardware and software, which have the function of collecting, transmitting, processing and storing information. They are intended for both business and leisure use, as well as educational purposes. Information and communication technologies also include the use of augmented reality which is used to educate both healthcare staff and the lay population. It provides a modern educational experience which prepares participants for a real situation when dealing with an emergency like reanimation. Familiarity with basic life support algorithm is very important when talking about collective safety of a population when dealing with vitally endangered person.

**Methods:** Method used was meta-analysis with critical review of Slovene and English professional and scientific literature using CINAHL, Medline, ERIC, Google scholar, Cochrane library and COBIS.SI base of information. Literature was obtained using a certain criteria that included literature published between the years 2010 and 2020. Articles talk about using augmented reality in purpose of education.

**Results:** Augmented reality has a number of positive effects on education of lay population and is an important supplement to modern education. One of the most important positive effects is the chance of gaining real-life experience that do not happen everyday in real life. Advances in modern technology have made this experience very real-life like and it helps to prepare the participant to a real situation which demands certain level of knowledge, stress management and quick acting for managing emergencies.

**Discussion and conclusion:** Use of modern technology for purpose of education is very welcome as in healthcare as in lay population. It enables us new level of educational approaches and improves results of education. It is an important part of providing collective security in sense of knowing basic life support algorithm. Chance of survival is increase when lay population is trained in basic life support algorithms.

**Key words:** augmented reality, education, basic life support

## Portal zVEM - varno stičišče storitev eZdravja in zdravstvene dokumentacije

*Živa Rant, Jure Janet, Dalibor Stanimirović*

*Nacionalni inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija*

Izhodišča in namen: Slovenija ima relativno dobro razvite informacijske rešitve eZdravja. Med glavnimi rešitvami je tudi nacionalni Portal zVEM (zdravje vse na enem mestu). Spletna rešitev omogoča pacientom in zdravstvenim delavcem varen dostop do storitev eZdravja in zdravstvene dokumentacije. Tehnično in infrastrukturno je bila vzpostavljena novembra 2015, polna uporaba je možna od začetka leta 2017.

Predstavitev vsebine: Preko portala zVEM lahko pacient pregleduje svoje podatke in podatke svojih otrok do 15. leta starosti. Velika dodana vrednost je vpogled v zdravstveno dokumentacijo, ki obsega specialistične ambulantne izvide, odpustna pisma iz bolnišnic in povzetek podatkov o pacientu. Slednji je strukturiran zapis, ki ga sestavljajo najpomembnejši zdravstveni podatki, potrebni za kakovostno zdravstveno obravnavo in so del Centralnega registra podatkov o pacientih. Te dokumente lahko v svojem sistemu vidijo tudi lečeči zdravniki in tako pacientom ni več potrebno prenašati izvidov med različnimi izvajalci zdravstvene dejavnosti. Pacient lahko v portalu zVEM pregleduje predpisana in izdana zdravila, svoje napotnice in naročila, vključno s čakalnimi dobami. Preko portala zVEM je možno elektronsko naročanje na zdravstvene storitve in odpoved termina. Na voljo je povzetek pisnih izjav volje pacienta. Pacienti na portalu najdejo tudi preverjene zdravstvene informacije in izpolnjujejo ankete. Za uporabo vseh funkcionalnosti Portala zVEM je potrebna registracija s kvalificiranim digitalnim potrdilom. Število aktivnih uporabnikov portala zVEM nenehno narašča, do marca 2020 jih je bilo že več kot 38.000. Mesečni obisk je januarja 2020 prvič presegel 100.000 in vztrajno raste. Največ pacientov si je ogledalo napotnice in prenašalo dokumente. Po podatkih Statističnega urada Republike Slovenije je portal zVEM uporabljalo 15 % 16–74-letnikov, delež uporabnikov je bil najvišji med osebami, starimi 35–44 let.

Sklepne ugotovitve: Portal zVEM predstavlja pomemben razvojni mejnik v zgodovini slovenskega zdravstva, gledano tako z vidika pacientov, kot tudi z vidika zdravstvenih delavcev. Naraščanje števila uporabnikov jasno potrjuje, da se pacienti vedno bolj zavedajo prednosti vpogleda v svoje podatke. Kaže tudi, da pacienti prevzemajo vedno bolj aktivno vlogo v skrbi za svoje zdravje in dobro počutje.

*Ključne besede:* portal zVEM, eZdravje, pacient, zdravstveni podatki, zdravstvena dokumentacija



## **zVEM Portal - a safe hub for eHealth services and medical documentation**

*Živa Rant, Jure Janet, Dalibor Stanimirović*

*National Institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia*

Basics and intent: Slovenia has relatively well developed IT solutions for eHealth services. One of the main solutions provided is the national eHealth portal named zVEM (in Slovenian: zdravje vse na enem mestu, all health services on one entry point). The web-based zVEM portal enables a safe access to eHealth services and medical documentation for patients and healthcare providers. The technological and infrastructural groundwork for the zVEM portal was established in November 2015, while a full release with all features for users was launched in early 2017.

Content: By the use of zVEM portal patients can look over medical documentation for themselves or their children (under 15 years). Medical documentation on the zVEM portal contains specialist medical results, release letters from the hospitals and patient summary. The latter is a structured data record, which consists of several important medical data, needed for a quick scan of a patient's medical condition and treatment, and is part of the Central Patient Data Registry. All of these documents are accessible to doctors, so that patients do not have to carry them during medical treatment from one doctor to another. Patients can also revise their prescribed and issued medications, and review active and appointed referrals, including waiting times for the designated medical services. It is also possible to arrange an appointment for medical services via the zVEM portal, including a possible cancellation. zVEM additionally provides patient declarations of intent, general medical information and research questionnaires. All features of the zVEM portal are available upon registration with a personal digital certificate.

The number of the zVEM portal active users is rapidly growing, and up to March 2020, more than 38.000 users were registered, with more than 100.000 monthly visitors in January 2020, and the numbers keep growing. Most patients revise their referrals and other medical documentation. According to the data of the Statistical Office of Slovenia, zVEM portal was used by 15% of 16–74-year olds, the user share was the highest among persons between 35 and 44 years.

Main findings: zVEM portal is an important development milestone in the history of the Slovenian public healthcare, both for the patients and for the healthcare providers. The rising number of the zVEM portal users clearly confirms the growing awareness of the benefits of medical data and the significant interest of patients in taking a more active role in caring for their health and well-being.

**Key words:** zVEM Portal, eHealth, patient, medical data, medical documentation

## STAR-VITAL projekt: Dejavniki zagotavljanja participacije v programih promocije zdravja

Natalija Rozman<sup>1</sup>, Klemen Širok<sup>2</sup>

<sup>1</sup> Nacionalni inštitut za javno zdravje, Trubarjeva 2, 1000 Ljubljana, Slovenija

<sup>2</sup> Univerza Na primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** Za zagotavljanje trajnostnih in zdravih delovnih mest v projektu STAR-VITAL spodbujamo deležnike, da se ustrezno spopadejo z izzivi staranja delovne sile. Pri tem brezplačno izvajamo individualizirane aktivnosti za zaposlene in managerje v podjetjih. Te – poleg ostalih ukrepov, kot so delavnice, mentoriranje in coaching – s prilagojenimi komunikacijskimi kampanjami preko t.i. customer relations management (CRM) informacijske platforme ciljno nagovarjamo in aktivno spodbujamo k spremembi vedenja pri skrbi za lastno zdravje. Ta pristop (z internim nazivom ePlatforma), ki ga podrobneje predstavimo v nadaljevanju, v prvi vrsti naslavlja splošni izziv nizkih stopenj participacije oziroma aktivne vključenosti zaposlenih v programe promocije zdravja.

**Metode:** CRM sistemi služijo upravljanju interakcij s trenutnimi in potencialnimi strankami, pri čemer se uporablja analizo podatkov o zgodovini interakcij strank s podjetjem za potrebe izboljšanja poslovnih odnosov s strankami, s poudarkom na zadrževanju strank in spodbujanju nakupnega vedenja. Na CRM sistemu temelječa ePlatforma tako omogoča: napredno personalizirano komunikacijo preko spleta in mobilnih naprav, anketiranje preko mobilnih naprav, upravljanje GDPR obrazcev, API izmenjavo podatkov, napredno segmentacijo uporabnikov in napredne statistike spremljanja komunikacije ter interesov uporabnika. Bogastvo podatkov, ki jih generira ePlatforma, omogoča tudi identifikacijo dejavnikov, ki so povezani z intenzivnostjo vključenosti zaposlenih in podjetja v ukrepe promocije zdravja: narava dela zaposlenega, izpostavljenost dejavnikom tveganja za zdravje, trenutni življenjski slog, specifične podjetja, specifične branže, prisotnost zdravstvenih težav, demografske značilnosti ...

**Rezultati:** Ker projekt poteka v več valovih, predstavljamo izsledke prve skupine 31 (od 80) podjetij oziroma 74 managerjev, ki so pričeli z aktivnostmi kampanje za managerje v podjetjih. Kampanjo sestavlja 9 aktivnosti, katerih cilj je razvoj in uspešna uvedba programa promocije zdravja pri delu. Uporaba ePlatforme do sedaj kaže na 68% uspešnost (21 od 31 podjetij do sedaj aktivno sodeluje). S pomočjo analize variance bomo v naslednjih mesecih identificirali tiste razlike med posamezniki in podjetji, ki so povezane z intenzivnostjo sodelovanja v kampanjah in izvajanja predvidenih aktivnosti.

**Razprava in zaključek:** Z ustrezno uporabo ePlatforme lahko omogočimo večjo oporo in opolnomočenje tako delavcev kot podjetja za spremembo vedenja na delovnem mestu (in izven dela), ki vodi v smeri večje skrbi za lastno zdravje in podaljševanje delovne aktivnosti. Da bo učinek še boljši, je potrebno identificirati pristope, aktivnosti in/ali dejavnike, ki vključene motivirajo za sodelovanje in spremembo vedenja.

**Ključne besede:** odzivnost, udeležba, CRM, ukrepi, promocija zdravja

## **STAR-VITAL project: Factors for ensuring participation in health promotion programs**

Natalija Rozman<sup>1</sup>, Klemen Širok<sup>2</sup>

<sup>1</sup> National Institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia

<sup>2</sup> University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** To ensure sustainable and healthy jobs, the STAR-VITAL project encourages stakeholders to tackle the challenges of an aging workforce. Free of charge, we carry out individualized workplace wellbeing activities for employees and managers in companies. Participants are - in addition to other measures such as workshops, mentoring and coaching – also admitted into customized communication campaigns based on customer relations management (CRM) information platform, with aim to change their health related behaviour. This approach (with the internal name ePlatform), which is presented below, primarily addresses the general challenge of low levels of participation or active involvement of employees in workplace wellbeing programs.

**Methods:** CRM systems are used to manage interactions with current and potential customers, using analysis of customer interaction history with a business to improve customer relationship with a focus on customer retention and encourage purchasing behaviour. The CRM based ePlatform enables advanced personalized web-based and mobile device communication, mobile surveying, GDPR form management, API data sharing, advanced user segmentation, and advanced monitoring and users' interests' statistics. The wealth of data generated by ePlatform also enables identification of factors related to the intensity of employee and company involvement in workplace wellbeing measures: work specifics, exposure to health risk factors, current lifestyle, company specifics, industry specifics, employee's health issues, demographic characteristics, ...

**Results:** As the project runs in several waves, we present the results of the first group of 31 (out of 80) companies, which are represented by 74 managers, involved in the campaign. The campaign for management consists of nine activities, aimed at the development and successful implementation of a workplace wellbeing program. The use of the ePlatform so far shows a 68% success rate (21 out of 31 companies are currently actively participating). With the help of analysis of variance, in the coming months we will identify those differences between individuals and companies that are related to the intensity of participation in campaigns and the implementation of planned activities.

**Discussion and conclusions:** Proper use of ePlatform enables improved support and empowerment of workers and companies in changing workplace and behaviours, leading to improved care for their own health and prolongation of work activity. To maximize the impact, it is necessary to identify approaches, activities and/or factors that motivate those involved to participate and to change their health and wellbeing behaviour.

**Key words:** responsiveness, participation, CRM, measures, health promotion

## Uporaba informacijsko komunikacijske tehnologije pri vodenju diabetesa tipa I

Eva Skočir, Tereza Sever, Tadeja Vidmar, Andrej Starc  
Univerza v Ljubljani, Zdravstvena fakulteta, Zdravstvena pot 5, 1000 Ljubljana, Slovenija

Uvod: Incidenca diabetesa tipa I narašča. Hkrati diabetes predstavlja eno največjih tveganj za pojav mnogih drugih bolezni oz. zapletov povezanih s sladkorno boleznijo, ter s tem veliko obremenitev za zdravstveni sistem. Zapleti sladkorne bolezni se pojavljajo pogosteje, če je ta slabo urejena. Za sladkorno boleznijo tipa I pogosto zbolevalo že otroci in mladi odrasli in s tem predstavljajo velik del delovno aktivne populacije.

Metode: Uporabljena je bila deskriptivna metoda dela s kritičnim pregledom strokovne in znanstvene literature. Literaturo smo iskali v podatkovnih bazah CINAHL, Medline in ScienceDirect, dostopnih preko mrežnika DiKUL. Iskali smo s pomočjo ključnih besed diabetes type I, information technology in healthcare, diabetes management, diabetes control, diabetes self-management, disease management, information communication technology, in sladkorna bolezen tipa I, ki smo jih v različnih a smiselni kombinacijah vnašali v iskalnik. Najdenih je bilo več sto virov literature. Na podlagi ustreznosti naslovov smo naredili ožji izbor in se nato na podlagi prebranih izvlečkov odločili, da v pravo prispevka vključimo 19 virov literature. Vključitveni kriteriji pri odločanju glede uporabe virov literature: viri, objavljeni po letu 2014; viri, ki so v celoti dostopni prek spleta; prosto dostopni članki; le strokovna in znanstvena literatura, viri v slovenskem in angleškem jeziku. Iskanje literature je potekalo v drugi polovici februarja in prvi polovici marca 2020.

Rezultati: Napredek na področju informacijsko komunikacijske tehnologije odpira možnosti za okrepljeno oskrbo bolnikov s sladkorno boleznijo, kar pomeni korak k lažjemu in boljšemu vodenju sladkorne bolezni. Merilci krvnega sladkorja kontinuirano merijo krvni sladkor in v aplikacijo na pametnem telefonu ali direktno v inzulinsko črpalko prenašajo meritve. Omenjene črpalke se nato povezujejo tudi z računalniki, kjer je omogočen boljši pregled nad celotnim stanjem krvnega sladkorja. Različne mobilne aplikacije za pametne telefone omogočajo posvetovanje preko spleta in podporne skupine bolnikom. Razvoj na tem področju odpira večje možnosti za oskrbo bolnikov s sladkorno boleznijo. Novejše tehnologije nudijo priložnosti za premagovanje ovir pri oskrbi, kot so geografska oddaljenost in pomanjkanje dostopa do informacij, ki se lahko pojavijo neodvisno od starosti pacienta.

Razprava in zaključek: Naprave kot so inzulinske črpalke in različne naprave za kontinuirano merjenje krvnega sladkorja se vse bolj povezujejo druga z drugo oziroma z različnimi programi in aplikacijami na osebnih računalnikih in pametnih telefonih. Na ta način omogočajo boljši nadzor posameznika nad krvnim sladkorjem, zdravstvenim delavcem pa pomagajo pri prepoznavanju vzorcev in možnosti za pomoč pacientu. Tehnologija vodi k zmanjševanju pojavnosti zapletov sladkorne bolezni in posledično k večjemu deležu populacije, ki je sposobna opravljati svoj poklic in k manjši obremenitvi zdravstva, zavarovalnic in države.

*Ključne besede:* sladkorna bolezen tipa I, zdravstveni delavci, delovno-aktivni, tehnološke naprave, zapleti

## **Type I diabetes management using information communication technology**

*Eva Skočir, Tereza Sever, Tadeja Vidmar, Andrej Starc*  
*University of Ljubljana, Faculty of Health Sciences, Zdravstvena pot 5,*  
*1000 Ljubljana, Slovenia*

**Introduction:** The incidence of diabetes type I is increasing. Meanwhile, diabetes represents one of the greatest risks for comorbidity with other diseases and late complications associated with diabetes, thus a great burden for the health system. Diabetes complications occur more often if the disease is poorly managed. Type I diabetes is often diagnosed in children and young adults who represent a big part of the working population.

**Methods:** We used the descriptive method with a systematic overview of scientific and professional literature. We searched through CINAHL, Medline, ScienceDirect databases. The key words we searched for were: diabetes type I, information technology in healthcare, diabetes management, diabetes control, diabetes self-management, disease management, information communication technology and sladkorna bolezen tipa I. We typed them into a search engine in various yet meaningful combinations in Slovene and English language. Hundreds of sources of literature have been found. Based on the suitability of the titles a selection was made. Furthermore, based on reading of abstracts, we decided to include 19 sources in preparation of the article. Inclusion criteria when deciding which sources to use were: sources published after 2014; resources that have full access online; available articles for free; professional and scientific literature only; Slovenian and English sources only. The literature search took place in the second half of February and the first half of March 2020.

**Results:** Progress in the field of information and communication technology opens up possibilities for improved health care for patients with diabetes, which is a step toward easier and better diabetes management. Blood glucose monitors continuously measure blood sugar and transmit measurements to the apps on smartphones or directly to the insulin pumps. These pumps then connect to computers where a better overview of the blood sugar status is enabled. Various smartphone applications provide online consultation and support for patients. This development creates greater chance for better patient-focused health care. New technologies offer opportunities to overcome barriers, such as geographical distance and lack of access to information that may occur regardless of the patient's age.

**Discussion and conclusions:** Devices such as insulin pumps and various devices for continuous measurement of blood sugar are increasingly interconnecting with each other or with various programmes and applications on PCs and smartphones, therefore allowing individuals a better control of their blood sugar and helping healthcare professionals identify patterns and options in order to help the patient. Technology use is a tool that leads towards decrease of numbers of patients with diabetes complications. Consequently, a higher percentage of individuals that are capable of pursuing their profession are reducing the burden of health care, insurance companies and the state.

**Key words:** type I diabetes mellitus, healthcare professionals, active working population, technology, diabetes complications

## Vpliv informacijsko komunikacijske tehnologije na kakovost življenja delovno aktivne populacije

Mitja Slapar<sup>1</sup>, Anton Zupan<sup>2</sup>

<sup>1</sup> Alma Mater Europaea – ECM, Slovenska 17, 2000 Maribor, Slovenija

<sup>2</sup> Univerzitetni rehabilitacijski inštitut Soča, Linhartova 51, 1000 Ljubljana, Slovenija

**Uvod:** V zadnjem obdobju opažamo velik napredek na področju tehničnih znanosti, še prav posebej na področju informacijsko-komunikacijske tehnologije (IKT). Namen prispevka je prikazati pomen IKT na kvaliteto življenja delovno aktivne populacije.

**Metode:** Metoda dela je bila pregled literature, analiziranje in primerjanje dosedanjih znanstvenih spoznanj o vplivu IKT na kakovost življenja delovno aktivne populacije. Temeljni inštrument zbiranja podatkov je bila znanstvena in strokovna literatura na izbrano temo v zadnjem obdobju. Pregled literature je bil opravljen v marcu 2020 v bazah Google Scholar in Pro Quest s ključnimi besedami v angleškem jeziku »ICT« in »quality of life«. Končni pregled literature, izbrane po kriteriju vsebinsko primernih povzetkov in po izločitvi starejše literature, je vseboval preko 50 virov.

**Rezultati:** IKT - senzori, aktuatorji, kamere in druge naprave, ki se med seboj ali preko interneta povezujejo in jih je moč upravljati na najrazličnejše načine, lahko ljudem omogoča nadzor njihovega zdravstvenega stanja, ugodno in varno bivanje v njihovem domačem okolju in upravljanje bivalnega okolja. S pomočjo IKT se lahko povezujejo preko socialnih omrežij v skupnosti, ki so v njihovem interesu. Poiščejo tudi različne dogodke, ki se jih lahko udeležijo fizično ali preko spleta. IKT omogoča lažjo mobilnost, saj s pomočjo različnih aplikacij prikaže najugodnejše ali najhitrejši smeri potovanja tako z osebnim prevoznim sredstvom kot glede izbire javnega prometa do določenega cilja, ugodne počitniške, turistične nastanitve in drugo. Spletno bančništvo in spletne trgovine olajšajo ljudem odvečne poti do bank in nošenje težkih stvari iz trgovin, tako da lahko energijo prihranijo za lepše stvari, kot so varen sprehod v naravi ali druženje z bližnjimi.

**Razprava in zaključek:** IKT omogoča delovno aktivnim ljudem bolj udobno, varno in kakovostno življenje. Sodobna IKT delovno aktivnim ljudem omogoča delo na daljavo, tako da lahko delajo doma in ne izgubljajo časa za pot v službo in nazaj in da lahko čas izkoristijo za rekreacijo in šport z namenom krepitve zdravja in druženje s svojimi bližnjimi, kar vse vpliva na kakovost njihovega življenja in življenja drugih. Potrebno je omeniti zelo velik pomen sodobne IKT za invalide z najrazličnejšimi vrstami in stopnjami invalidnosti, saj jim IKT omogoča, da postanejo delovno aktivni in s tem enakovredni člani širše družbene skupnosti, ki tako kot vsi drugi delovno aktivni ljudje, plačujejo davke in dajatve ter enakovredno prispevajo k družbeni blaginji. Poleg tega dejstvo, da so zaposleni, zelo ugodno vpliva na njihovo psihofizično kondicijo in posledično na njihovo kakovost življenja.

**Ključne besede:** informacijsko-komunikacijska tehnologija, kakovost življenja, delovno aktivna populacija

## The impact of information-communication technology on the quality of life of the working-age population

Mitja Slapar<sup>1</sup>, Anton Zupan<sup>2</sup>

<sup>1</sup> Alma Mater Europaea – ECM, Slovenska 17, 2000 Maribor, Slovenia

<sup>2</sup> University Rehabilitation Institute, Republic of Slovenia, Linhartova 51, 1000 Ljubljana, Slovenia

**Introduction:** There has been a great progress in the field of technical sciences, especially in the field of information-communication technology (ICT). The purpose of the paper is to show the importance of ICT on the quality of life of the working-age population.

**Methods:** The method of work was to review the literature, analyze and compare current scientific findings on the impact of ICT on the quality of life of the working-age population. The basic instrument of data collection has been the scientific and professional literature on a selected topic in the recent period. The literature review was conducted in March 2020 in Google Scholar and Pro Quest databases with keywords in english language „ICT“ and „quality of life“. The final review of the literature, selected according to the criterion of content-relevant summaries and after the elimination of older literature, contained over 50 sources.

**Results:** ICT - sensors, actuators, cameras and other devices that connect to each other or via the Internet and can be managed in a variety of ways, can enable people to control their health status, enjoy a comfortable and safe living in their home environment and manage their living environment. They can connect through ICT with social networks in the community of their interest. They also look for different events that they can attend physically or online. ICT through various applications facilitates mobility by displaying the most convenient or fastest routes of travel, both by personal means of transport and the choice of public transport to a specific destination, favorable holiday, tourist accommodation and more. Online banking and online shopping means that people don't need to go to the banks and carry heavy items from stores, so they can save energy for nicer things like a safe walk in nature or hanging out with loved ones.

**Discussion and conclusions:** ICT enables working people to have a more comfortable, secure and quality life. Modern ICT enables working people to work remotely so that they can work from home and lose no time in travelling to work and that they can use their time for recreation and sports to promote health and socialize with their loved ones, all of which affect the quality of their lives and lives of others. It is worth mentioning the great importance of modern ICT for people with disabilities of all kinds and levels of disability, as ICT enables them to become active workers and thus equal members of the wider community, who, like all other working people, pay taxes and benefits and contribute to social well-being. In addition, the fact that they are employed has a very beneficial effect on their psychophysical fitness and, consequently, on their quality of life.

**Key words:** information-communication technology, quality of life, working-age population





## **Posterji**

## **Poster presentations**

---

## Indirektni psihosocialni dejavniki tveganja za zdravje zaposlenih v bolnišnici

Jana Bizjak, Melita Peršolja

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** Z zdravjem zaposlenih se povezujejo psihosocialni dejavniki tveganja, katerim so zaposleni izpostavljeni. Delimo jih na direktne in indirektno. Med indirektno dejavnike tveganja na delovnem mestu uvrščamo: odnos do dela, medosebne odnose, organizacijsko kulturo, osebnostne značilnosti, razvoj poklicne kariere, razmejitev zasebnega življenja in dela ter skrb zase. Namen raziskave je bil predstaviti in analizirati indirektno psihosocialne dejavnike tveganja za zdravje zaposlenih.

**Metode:** V splošni bolnišnici z 994 zaposlenimi, je bila izvedena opisna presečna študija na vzorcu 112 oseb. Kot merski instrument je bil uporabljen standardiziran vprašalnik Obvladovanje psihosocialnih tveganj in absentizma, s katerim je bila raziskovana povezanost indirektnih dejavnikov tveganja s psihofizičnim zdravstvenim stanjem zaposlenih.

**Rezultati:** Raziskava kaže, da so imeli anketiranci od zdravstvenih težav najpogostejše bolečine v mišicah ramena, vratu ter zgornjih udov. Poročajo tudi, da se v veliki meri pojavljajo težave s hrbtenico, tem pa sledijo bolečine v mišicah spodnjih udov. Rezultati raziskave kažejo, da so odnos do dela ( $r=0,513$ ;  $p=0,000$ ), medosebni odnosi ( $r=0,463$ ;  $p=0,000$ ), organizacijska kultura ( $r=0,371$ ;  $p=0,000$ ), osebnostne značilnosti ( $r=0,584$ ;  $p=0,000$ ), razvoj poklicne kariere ( $r=0,247$ ;  $p=0,009$ ), razmejitev zasebnega življenja in dela ( $r=0,241$ ;  $p=0,010$ ) ter skrb zase ( $r=0,472$ ;  $p=0,000$ ) povezani s psihofizičnim zdravjem zaposlenih.

**Razprava in zaključek:** Nadzor psiho-socialnih dejavnikov tveganja na delovnem mestu je pomemben za ugotavljanje lastnosti delovnega okolja in za ustrezno spreminjanje delovnega okolja v zdravju prijaznejšega. Pomembno je, da se zaposleni v bolnišnicah zavedajo dejavnikov tveganja za razvoj bolezni. Pregled in nadzor nad psihosocialnimi dejavniki tveganja je pomemben tudi za razvoj politik in programov na preprečevanje stresa na delovnem mestu, spodbujanje fizičnega in psihičnega zdravja ter počutja zaposlenih.

**Ključne besede:** bolnišnica; dejavniki tveganja za zdravje; preventiva; zaposleni

## Indirect psycho-social factors of hospital health risks

Jana Bizjak, Melita Peršolja

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Health of employees is associated with workplace psycho-social factors. We divide them into direct and indirect. Among the indirect factors in the workplace are: attitudes towards work, interpersonal relationships, organizational culture, personal skills, career development, delimitation of private life and self-care. The purpose of the research was to describe the indirect psycho-social factors for employee health.

**Method:** A descriptive study on a sample of 112 people was conducted at the general hospital with 994 employees. A standardized questionnaire, Management of Psychosocial Risks in Absenteeism, was used as a measuring instrument, with which indirect factors of psycho-social health were investigated.

**Results:** The research shows that employees had many problems with pain in the shoulder muscles. They also reported problems with spine, and pain in the muscles of the lower limbs. The results of the research show that attitudes towards work ( $r=0,513$ ;  $p=0,000$ ), interpersonal relationships ( $r=0,463$ ;  $p=0,000$ ), organizational culture ( $r=0,371$ ;  $p=0,000$ ), personality differences ( $r=0,584$ ;  $p=0,000$ ), career development ( $r=0,247$ ;  $p=0,009$ ), placement of private lives in lag ( $r=0,241$ ;  $p=0,010$ ) and self-care ( $r=0,472$ ;  $p=0,000$ ) are all associated with psycho-physical health.

**Discussion and conclusion:** The results show that all indirect psycho-social risk factors, which were analyzed, are related to psycho-physical health of employees. Control of psycho-social risk factors in the workplace is important for determining the characteristics of work environment and for the appropriate change. It is important that also hospital employees are aware of the workplace risk factors.

**Key words:** health risk factors; hospital; prevention; employees

## Uživanje probiotikov pri gibalno/športno aktivni populaciji

*Dominika Češek, Katja Bezek, Mihaela Jurdana*

*Univerza na Primorskem Fakulteta za vede o zdravju, Polje 42, 631 Izola, Slovenija*

**Uvod:** Znano je, da ima priporočena raven gibalno/športne aktivnosti (GŠA) pozitivne učinke na zdravje posameznikov. Nizka in visoko-intenzivna stopnja GŠA lahko privedeta do negativnih posledic, z delovanjem na imunski sistem in spremembo prepustnosti črevesne pregrade, kar vodi do večjega tveganja za razvoj vnetja in okužb. Glede na povezavo med prebavnim sistemom in simbiotskimi mikroorganizmi, tj. mikrobiota, bi lahko uživanje probiotikov posredno vplivalo na zdravje posameznikov z visoko intenzivno GŠA. Število študij, ki opisujejo učinke probiotikov na imunski in prebavni sistem, na pojavnost respiratornih okužb ter na zmogljivost aktivnih posameznikov, narašča. Prispevek opisuje povezavo med uživanjem probiotikov in zdravjem posameznikov z različnimi stopnjami GŠA.

**Metode:** S pregledom literature smo pridobili podatke o učinkih probiotikov na zdravje splošne in GŠA populacije. Izvedli smo anketo, v kateri je sodelovalo 33 preiskovancev. V analizo so bili zajeti pridobljeni podatki o GŠA, prehranskih navadah, defekaciji ter poznavanju in rabi probiotikov pri izbrani populaciji.

**Rezultati:** Probiotiki imajo ugoden učinek na zdravje in zmogljivost pri GŠA populaciji, če so zaužiti redno in v zadostni količini. Znanje preiskovancev o pojmu »probiotiki« je bilo sprejemljivo, a znanje o virih probiotikov v vsakdanji prehrani ni bilo zadostno. Uživanje probiotikov v obliki živil in prehranskih dopolnil v izbrani populaciji je bilo nezadostno.

**Razprava in zaključek:** Glede na omejitve študij, npr. majhni vzorci, kratka obdobja uživanja probiotikov in izbira probiotičnih sevov, je težko povzeti specifične učinke probiotikov pri GŠA populaciji. Potrebna je izvedba dodatnih študij s standardiziranimi protokoli za potrditev učinkov probiotikov pri posameznikih z enako stopnjo GŠA. Na podlagi rezultatov ankete sklepamo, da je znanje o učinkih uživanja probiotikov v mlajših generacijah pomanjkljivo. Izražena je potreba po izobraževalnih aktivnostih pri mlajših odraslih, tudi v povezavi uživanja probiotikov in GŠA.

**Ključne besede:** črevesna mikrobiota, probiotiki, gibalno/športna aktivnost

## Probiotics consumption in physically active individuals

*Dominika Češek, Katja Bezek, Mihaela Jurdana*

*University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia*

**Introduction:** It is well known that physical activity (PA) recommendation has positive effects on individual's health status. On the other hand, low levels and excessive exercise can lead to negative consequences, influencing the immune system and changing the permeability of a gut barrier leading to a higher risk for infections and inflammation. Considering the link between gastrointestinal (GI) tract and symbiotic microorganisms, or microbiota, probiotics consumption might have an indirect influence on the health status of individuals with vigorous physical activity. There is an increasing number of studies describing the probiotic effect on immune and GI tract function, affecting the respiratory infections, and the performance of active individuals. This report provides data between probiotic consumption and the health status of individuals with different levels of physical activity.

**Methods:** Literature review was focused on the effects of probiotics on health status of general and PA population. In questionnaire-based survey 33 individuals were included. The data regarding PA, eating habits, defecation and knowledge and use of probiotics were collected and analyzed.

**Results:** Probiotics have a beneficial effect on health status and performance in PA individuals when consumed regularly and in adequate amount. Although the participant's knowledge about the term »probiotics« was acceptable, the knowledge about the source of probiotics in daily diet was insufficient. Probiotic consumption in form of foodstuff and dietary supplement in the selected population was inadequate.

**Discussion and conclusions:** Due to the study limitations observed, e.g. small samples, short periods of probiotic consumption and choice of different probiotic strains, it is difficult to summarize the specific effect of the probiotic consumption on PA individuals. There is a need for additional studies with standardized protocols to confirm the health benefits of probiotics on individuals with the same level of PA. Based on the questionnaire results we can conclude that the knowledge about probiotic consumption effects of younger generations is insufficient. On behalf of this study results there is a need for educational activities among younger adults also in the aspect of probiotics consumption in relation to PA.

**Key words:** gut microbiota, probiotics, physical activity

## Kakovost življenja delovno sposobnih ljudi po možganski kapi v okviru poklicne dejavnosti

Bożena Kowalczyk<sup>1</sup>, Bożena Zawadzka<sup>2</sup>, Bogumiła Lubińska-Żądło<sup>1</sup>

<sup>1</sup> Faculty of Health Sciences, Podhale State College of Applied Sciences, ul. Kokoszków 71, 34-400 Nowy Targ, Poland

<sup>2</sup> Institute Of Pedagogy And Psychology Department of Health Pedagogy, Jan Kochanowski University, ul. Krakowska 11, 25-029 Kielce, Poland

**Uvod:** Možganska kap je ena najpogostejših in najhujših boleznih z vidika ekonomskega bremena za družbo. Vrnitev na delo po možganski kapi je odvisna od številnih dejavnikov, vključno z vrsto možganske kapi, nevrološkimi primanjkljaji in tudi od vrste opravljanega dela pred možgansko kapjo. Posledično možganska kap in njene posledice določajo poklicno dejavnost osebe po možganski kapi, kar je dejavnik, ki določa kakovost življenja. Namen te študije je bil oceniti kakovost življenja ljudi po možganski kapi v okviru poklicne dejavnosti, upoštevajoč čas od možganske kapi.

**Material in metode:** Za oceno kakovosti življenja je bila uporabljena skrajšana poljska različica vprašalnika o kakovosti življenja Svetovne zdravstvene organizacije (WHOQOL - Bref). Ta vprašalnik omogoča oceno razmerja med psihofizičnimi dejavniki, kot so družinski odnosi in poklicna dejavnost zdrave osebe in osebe, ki trpi zaradi različnih zdravstvenih stanj. Študija je bila izvedena na skupini 279 ljudi z diagnozo prve možganske kapi, ki so bili obravnavani na oddelkih za rehabilitacijo v bolnišnicah na Poljskem. Anketiranci, vključno s tistimi, ki so se po možganski kapi vrnili na delo, so bili razdeljeni v dve skupini: poklicno aktivne in poklicno neaktivne.

**Rezultati:** Povezava med poklicno dejavnostjo ljudi po možganski kapi in njihovo kakovostjo življenja je bila statistično pomembna v somatski sferi ( $p < 0,001$ ;  $p < 0,001$ ;  $p < 0,001$ ), v socialni sferi ( $p = 0,002$ ;  $p = 0,018$ ;  $p = 0,047$ ) in v okoljski sferi ( $p < 0,001$ ;  $p = 0,037$ ;  $p = 0,003$ ). Statistično značilno razmerje smo opazili upoštevajoč obdobje po možganski kapi med skupinama: od 6 do 12 mesecev, od 13 mesecev do 2 let in od 2 do 5 let po kapi.

**Sklepi:** Poklicna dejavnost ljudi, ki so doživeli možgansko kap, je pomembno vplivala na samocenenjevanje njihove kakovosti življenja in zadovoljstvo s kakovostjo zdravja, ne glede na obdobje po možganski kapi.

**Ključne besede:** kakovost življenja, možganska kap, delovna doba, poklicna dejavnost

## The quality of life of working-age people after stroke in the context of professional activity

Bożena Kowalczyk<sup>1</sup>, Bożena Zawadzka<sup>2</sup>, Bogumiła Lubińska-Żądło<sup>1</sup>

<sup>1</sup> Faculty of Health Sciences, Podhale State College of Applied Sciences, ul. Kokoszków 71, 34-400 Nowy Targ, Poland

<sup>2</sup> Institute Of Pedagogy And Psychology Department of Health Pedagogy, Jan Kochanowski University, ul. Krakowska 11, 25-029 Kielce, Poland

**Introduction:** Stroke is one of the most common and severe diseases in terms of the economic burden on society. Returning to work after a stroke depends on many factors, including the type of stroke, neurological deficits, as well as the type of work performed before the stroke to which the patient could return. As a result, the occurrence of stroke itself and its consequences determine the professional activity of a person after a stroke, which in turn is a factor determining the quality of life. The aim of this study was to assess the quality of life of people after stroke in the context of professional activity, considering the time since stroke.

**Material and methods:** To assess the quality of life, a shortened Polish version of the World Health Organization Quality of Life Questionnaire (WHOQOL - Bref) was used. This questionnaire makes it possible to assess the relationship between psychophysical factors such as family relationships and professional activity of both a healthy person and a person suffering from various medical conditions. The study was conducted on a group of 279 people with the first stroke diagnosed, who were in rehabilitation wards in hospitals in Poland. The respondents, including those returning to work after stroke, were divided into two groups: professionally active and professionally inactive ones.

**Results:** The correlation between the professional activity of people after stroke and their quality of life was statistically significant in the somatic sphere ( $p < 0,001$ ;  $p < 0,001$ ;  $p < 0,001$ ), in the social sphere ( $p=0,002$ ;  $p=0,018$ ;  $p=0,047$ ), and in the environmental sphere ( $p < 0,001$ ;  $p=0,037$ ;  $p=0,003$ ). The statistically significant relationship was observed, considering the period after stroke in groups: from 6 to 12 months, from 13 months to 2 years, and from 2 to 5 years from the onset of stroke.

**Conclusions:** Undertaking professional activity by people who had a stroke significantly affected the self-assessment of their quality of life and satisfaction with the quality of health, regardless of the period since the onset of the stroke.

**Key words:** quality of life, stroke, working age, occupational activity

## Uporaba IKT rešitev za zdrav življenjski slog delovno aktivne populacije v času pandemije COVID-19

Matjaž Likar<sup>1</sup>, Elena Likar<sup>2</sup>

<sup>1</sup> Društvo za razvoj človeških virov ALMA, Cankarjeva ulica 6e, 2000 Maribor, Slovenija

<sup>2</sup> Univerza v Ljubljani, Ekonomska fakulteta, Kardeljeva ploščad 17, 1000 Ljubljana, Slovenija

**Uvod:** Sodobne družbe se soočajo s številnimi izzivi, kot so na primer zdravje in varnost prebivalstva, socialno ekonomski izzivi, krčenje naravnega okolja, omejeni naravni viri, onesnaževanje idr. Hkrati se pojavljajo tudi mnoge priložnosti, ki temeljijo na novih tehnologijah, inovativnosti, poslovnih modelih, produktih in rešitvah. Skupnosti vidijo svojo bodočnost v kombinaciji trajnostnega razvoja, inovativnosti in uporabe znanja za reševanje izzivov. Za ta namen so bile oblikovane strategije, usmeritve in cilji, kot so npr. Agenda 2030 (Združeni narodi) ali pa Strategija razvoja Slovenije 2030. Vsi ti načrti so deležni ponovne presoje zaradi nastopa pandemije COVID-19. Pri prebivalstvu prihajajo v ospredje vrednote, kot so zdravje, varnost, zaupanje, socialna vključenost in dobro počutje.

**Metode:** V raziskavi želimo preveriti, kako je vplivala izolacija delovno aktivne populacije v času pandemije na njeno uporabo sodobnih IKT sredstev ter kako to spodbuja spreminjanje obnašanja in navad aktivnega prebivalstva, še posebej z vidika varovanja psihofizičnega zdravja, z vidika družbenih odnosov in na področju izobraževanja ter intelektualnih dejavnosti. Za pridobitev reprezentativnih podatkov nameravamo izvesti spletno anketo med aktivno populacijo.

**Rezultati:** Z rezultati ankete želimo preveriti poznavanje in uporabo sodobne IKT pri aktivni populaciji pred pandemijo in med izolacijo; ali so začeli uporabljati novo IKT kot podporo zdravemu življenjskemu slogu; ali je raba IKT sprožila kakšne spremembe v njihovih navadah ter kakšne kvalitativne spremembe pri svojem zdravju in splošnemu zadovoljstvu so zaznali.

**Razprava in zaključek:** Sodobna IKT je bila razpoznavna kot gibalo sprememb na mnogih področjih družbenega življenja. V času izolacije zaradi pandemije COVID-19 se je pri aktivni populaciji okrepilo zavedanje o koristni uporabi IKT za ohranjanje in izboljšanje psihofizičnega zdravja. Najbolj pogosto uporabljene IKT rešitve (mobilne aplikacije, spletni portali, pametni telefoni in druge naprave) so za fizično vadbo (moč, vztrajnost, ravnotežje, gibljivost), za sprostitve (joga, meditacija, zabava, igre), za izobraževanje in raziskovanje (znanje, kultura, umetnost) in nenazadnje za socialno vključenost (komuniciranje, druženje, informiranje). Zaradi omejitev in drugih sprememb, ki jih je povzročila pandemija COVID-19, bo vsakodnevna uporaba IKT postala še pomembnejši pripomoček za ohranjanje zdravja aktivne populacije, ob predpostavki, da bo uporabljena na koristen in produktiven način. Prihodnje raziskave bodo lahko podrobneje analizirale dolgoročne posledice aktualne krize na uporabo IKT in spremenjen življenjski slog delovno aktivne populacije.

**Ključne besede:** IKT, zdrav življenjski slog, trajnostni razvoj, inovativnost



## Use of ICT solutions for a healthy lifestyle of the working population during the COVID-19 pandemic

Matjaž Likar<sup>1</sup>, Elena Likar<sup>2</sup>

<sup>1</sup> ALMA - Human Resources Development Society, Cankarjeva ulica 6e, 2000 Maribor, Slovenia

<sup>2</sup> University of Ljubljana, Faculty of Economics, Kardeljeva ploščad 17, 1000 Ljubljana, Slovenia

**Introduction:** Modern societies face many challenges, such as health and safety of the population, socio-economic challenges, the shrinkage of the natural environment, limited natural resources, pollution, and so on. At the same time, many opportunities are emerging based on new technologies, innovation, business models, products and solutions. Communities see their future in a combination of sustainable development, innovation and the use of knowledge to meet challenges. For this purpose, strategies, guidelines and goals have been developed, such as e.g. Agenda 2030 (United Nations) or the Development Strategy of Slovenia 2030. All these plans are being reconsidered due to the onset of the COVID-19 pandemic. Values such as health, safety, trust, social inclusion and well-being come to the forefront of the population.

**Methods:** The research aims to examine how the isolation of the working population during the pandemic has affected its use of modern ICT resources and how this encourages changes in the behaviour and habits of the active population, especially in terms of mental and physical health, social relations and education and intellectual activities. To obtain representative data, we intend to conduct an online survey among the active population.

**Results:** With the results of the survey we want to check the understanding and usage of modern ICT in the active population before the pandemic and during isolation; whether they have started to use the new ICT to support a healthy lifestyle; whether the use of ICT triggered any changes in their habits and what qualitative changes in their health and general satisfaction they perceived.

**Discussion and conclusions:** Modern ICT has been recognized as a change driver in many areas of social life. During the isolation due to the COVID-19 pandemic, the active population became more aware of the beneficial use of ICT to maintain and improve psychophysical health. The most commonly used ICT solutions (mobile applications, web portals, smartphones and other devices) are for physical exercise (strength, perseverance, balance, mobility), for relaxation (yoga, meditation, entertainment, games), for education and research (knowledge, culture, art) and last but not least for social inclusion (communication, socializing, informing). Due to the limitations and other changes caused by the COVID-19 pandemic, the daily use of ICT will become an even more important tool for maintaining the health of the active population, assuming that it is used in a useful and productive way. Future research will be able to analyse in more detail the long-term consequences of the current crisis on the use of ICT and the changed lifestyle of the working population.

**Key words:** ICT, healthy lifestyle, sustainable development, innovation

## Pomanjkanje spanja v povezavi z delazmožnostjo medicinskih sester

Melita Peršolja, Anamarija Mišmaš, Mihaela Jurdana

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

Uvod: Izmensko delo, ki je značilno za poklic medicinske sestre, je dejavnik tveganja za zdravje. Izmensko delo je povezano s procesom spanja in motenega cirkadianega ritma, ki vpliva na kakovost delovnega življenja. Posledice izmenskega dela zdravstvenih delavcev in z njo povezana neprespanost se odražajo v prekomernem vnosu hranil, v večjem številu pokajenih cigaret, padcu pozornosti, povečani utrujenosti in zmanjšani delazmožnosti. Namen raziskave o odnosu med neprespanostjo in kakovostjo delovnega življenja je bil ugotoviti pomembnost spanja za delazmožnost zaposlenih v zdravstveni negi.

Metode: S kvantitativno neeksperimentalno deskriptivno metodo dela, so bili v presečni raziskavi podatki zbrani s tehniko pisnega anketiranja. Raziskava je bila izvedena v splošni bolnišnici in v dveh domovih za starejše občane v Sloveniji. Z enostavnim slučajnostnim izborom je bilo v stratificiran vzorec vključenih 21,26 % (n= 81) žensk zaposlenih v zdravstveni negi iz raziskovanih zavodov. Podatki pridobljeni z anketo (Cronbach  $\alpha=0,624$ ) so bili analizirani z deskriptivno statistiko in s korelacijsko analizo.

Rezultati: Težave z budnostjo na delovnem mestu se povezujejo s slabšim splošnim počutjem ( $r=0,236$ ,  $p=0,034$ ) in so pogostejše ob večjem številu nočnih izmen v mesecu ( $r= -0,322$ ,  $p=0,003$ ). Anketiranke so navedle, da neprespanost povečuje verjetnost napak pri delu (n= 60,74,1 %), upočasnjuje hitrost odzivanja na nepričakovane in nujne situacije na delovnem mestu (n= 58, 71,6 %) ter slabo vpliva na njihovo komunikacijo s pacienti (n= 48, 59,2 %).

Razprava in zaključek: Delo v zdravstveni negi je kontinuirano, kar pomeni da poteka proti biološki predispoziciji posameznika in ima lahko za posledico težave v vzorcih budnosti in spanja. Izmensko delo vpliva na večino telesnih funkcij, najizraziteje na spanje, avtonomne vegetativne procese (metabolizem, telesna temperatura, srčna frekvenca, krvni tlak, izločanje hormonov) in na delazmožnost. Neprespanost negativno vpliva na kognitivno odzivnost posameznika in jo je mogoče z ustrezno organizacijo urnika dela preprečiti. Utrujenost pa je (nasprotno) subjektivna in ni nujno, da se je posameznik sploh zaveda. Prav to težavo je mogoče zaslediti iz rezultatov te in drugih raziskav, kjer so zaposleni izrazili zadovoljstvo z razporedom dela, čeprav je vseboval nenehno spreminjanje ritma in obsega delovnih izmen.

*Ključne besede:* neprespanost, izmensko delo, kakovost dela, medicinske sestre, kakovost življenja

## Lack of sleep connection with the workability of nurses

Melita Peršolja, Anamarija Mišmaš, Mihaela Jurdana

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** The shift work, a characteristic of the nursing profession, is a risk factor for health. Because of the disturbed circadian rhythm of the employee, shift work triggers several psychological and physical changes that, in turn, reduce the quality of work life. The consequences of shift work for healthcare professionals and related insomnia are also reflected in over-eating, a higher number of smoked cigarettes, a decrease in attention, increased fatigue, and reduced work capacity. The purpose of the research was to determine the importance of sleep for the workability of the nursing staff.

**Methods:** Using a quantitative non-experimental descriptive method of work in the cross-sectional study, data were collected using the written survey technique. The research was conducted in a general hospital and two homes for the elderly in Slovenia. 21,26 % (n= 81) of women employed in nursing care from the surveyed institutions were included in the stratified sample by simple random selection. Data obtained from the survey (Cronbach  $\alpha=0,624$ ) were analyzed by descriptive statistics and by correlation analysis.

**Results:** Workplace wakefulness problems are associated with poorer well-being ( $r=0,236$ ,  $p=0,034$ ) and are more common when the nurse works more night shifts in the month ( $r=-0,322$ ,  $p=0,003$ ). Respondents stated that the lack of sleep increases the likelihood of errors at work (n= 60,74.1 %), slows down the speed of responding to unexpected and urgent workplace situations (n= 58, 71,6 %) and affects their communication with patients (n= 48, 59,2 %).

**Discussion and conclusions:** Nursing work is continuous and it goes against the biological predisposition of the individual. This can lead to problems in patterns of wakefulness and sleep. Shift work affects most body functions, most notably sleep, autonomic vegetative processes (metabolism, body temperature, heart rate, blood pressure, hormone secretion), and performance. Lack of sleep affects the cognitive responsiveness of the individual and can be prevented by properly organizing a work schedule. Fatigue, however, is (on the contrary) subjective and could be overlooked. This problem can be found in the results of this and other surveys, where employees expressed satisfaction with the work schedule, even though it contained a constant change in the rhythm and extent of work shifts.

**Key words:** shift work, sleep deprivation, fatigue, nurses, quality of life

## Direktni psihosocialni dejavniki tveganja za zdravje zaposlenih v bolnišnici

Tanja Rus, Melita Peršolja

Univerza na Primorskem, Fakulteta za vede o zdravju, Polje 42, 6310 Izola, Slovenija

**Uvod:** Na zdravje zaposlenih vplivata na eni strani narava dela in zadovoljstvo, ki ga pri tem zaposleni imajo, na drugi strani pa tudi psihosocialna tveganja, katerim so izpostavljeni vsi na delovnih mestih ne glede na položaj, velikost ali dejavnost delovne organizacije. Med direktna psihosocialna tveganja na delovnem mestu uvrščamo delovno okolje, delovno opremo ter fizične obremenitve, vsebino dela, delovne obremenitve, hitrost poteka dela ter urnik, odnos zaposlenega z nadrejenimi in obremenitve kot posledica sociodemografskih okoliščin. Namen raziskave je bil predstaviti in analizirati direktna tveganja oziroma fizične, kemične in biološke obremenitve, ki povečujejo verjetnost za poslabšanje psihofizičnega zdravstvenega stanja zaposlenih v zdravstveni ustanovi.

**Metode:** V splošni bolnišnici z 994 zaposlenimi, je bila izvedena opisna presečna študija na vzorcu 112 oseb. Kot merski instrument je bil uporabljen standardiziran vprašalnik Obvladovanje psihosocialnih tveganj in absentizma s katerim je bila raziskovana povezanost direktnih dejavnikov tveganja s psihofizičnim zdravstvenim stanjem zaposlenih.

**Rezultati:** Ugotavljamo, da so med zaposlenimi v bolnišnični ustanovi najpogostejše bolečine v mišicah ramen, vratu ter v področju zgornjih udov. Pogost tudi občutek preobremenjenosti in utrujenosti. S psihofizičnim zdravjem zaposlenega se povezujejo delovna obremenitev in hitrost poteka dela ( $r=0,283$ ;  $p=0,002$ ), delovno okolje, delovna oprema in fizične obremenitve ( $r=0,359$ ;  $p=0,000$ ), obremenitve kot posledica socio-demografskih okoliščin ( $r=0,290$ ;  $p=0,002$ ) in odnos zaposlenega z nadrejenim ( $r=0,304$ ;  $p=0,001$ ). Rezultati kažejo tudi, da se s psihofizičnim zdravjem zaposlenega ne povezujeta urnik in ne vsebina dela. Manj kot polovica anketirancev razmišlja o menjavi zaposlitve, tisti, ki bi se za ta korak odločili, pa bi to storili zaradi delovnega okolja.

**Razprava in zaključek:** Zdravi zaposleni so pomemben dejavnik dolgoročne uspešnosti organizacije, zato bi organizacije morale dati večji poudarek na zdravje svojih zaposlenih. Za zagotavljanje zdravja zaposlenih je ključno izogibanje direktnim dejavnikom tveganja na delovnem mestu. Večina direktnih psihosocialnih dejavnikov tveganja se namreč povezuje s psihofizičnim zdravstvenim stanjem zaposlenih. Pogostejši kot so dejavniki tveganja pri zaposlenih, slabše je njihovo psihofizično zdravstveno stanje.

**Ključne besede:** bolnišnica, dejavniki tveganja za zdravje, preventiva, zaposleni

## Direct psychosocial health risk factors in hospital employees

Tanja Rus, Melita Peršolja

University of Primorska, Faculty of Health Sciences, Polje 42, 6310 Izola, Slovenia

**Introduction:** Employee health is influenced on the one hand by the nature of work and the satisfaction that employees have, and on the other hand by the psycho-social risks to which everyone in the workplace is exposed, regardless of the position, size or activity of the work organization. Direct psychosocial risks at the workplace include the work environment, work equipment and physical loads, work content, workloads, speed of work and schedule, the employee's relationship with superiors and workloads. The purpose of the research was to present and analyze direct risks or physical, chemical and biological loads that increase the probability of deterioration of the psycho-physical health condition of employees in a health care institution.

**Methods:** In a general hospital with 994 employees, a descriptive cross-sectional study was conducted on a sample of 112 individuals. A standardized questionnaire Management of psychosocial risks and absenteeism was used as a measuring instrument, which was used to investigate the connection between direct risk factors and the psycho-physical health status of employees.

**Results:** We have found that the most common pains in the hospital staff are pain in the muscles of the shoulders, neck and upper limbs. Feelings of overwork and fatigue are also common. The psycho-physical health of the employee is associated with workload and work speed ( $r=0.283$ ;  $p=0.002$ ), work environment, work equipment and physical stress ( $r=0.359$ ;  $p=0.000$ ), stress as a result of socio-demographic circumstances ( $r=0.290$ ;  $p=0.002$ ) and the employee's relationship with the superior ( $r=0.304$ ;  $p=0.001$ ). The results also show that the schedule and the content of the work are not related to the psycho-physical health of the employee. Less than half of the respondents are considering to change job, and those who would, would do so because of the work environment.

**Discussion and conclusion:** Healthy employees are an important factor in the long-term success of an organization, so organizations should place more emphasis on the health of their employees. Avoiding direct workplace risk factors is key to ensuring employee health. Namely, most direct psychosocial risk factors are related to the psycho-physical health condition of employees. The more common the risk factors in employees, the worse their psychophysical health status.

**Key words:** health risk factors, hospital, prevention, employees

## Biokemijski in hematološki parametri pri zaznavi stopnje ledvične okvare: učinki na zmognosti dela

Damir Suljević, Lejla Klepo, Muhamed Fočak

University of Sarajevo, Faculty of Science, Zmaja od Bosne 33, 71000 Sarajevo, Bosna in Hercegovina

Uvod: Hemodializa je običajna oblika zdravljenja napredovane in kronične ledvične bolezni, ki predstavlja velik javno zdravstveni problem, zlasti v državah v razvoju. Napredovanje okvare ledvic se kaže v povišani koncentraciji številnih biokemijskih in hematoloških markerjev, ki prispevajo pri oceni delovanja ledvic. Hemodializa vpliva na številne vidike človekovega življenja, saj se z njo človeku spremeni življenjski slog. Cilj raziskave je bil ugotoviti pomembne razlike v koncentraciji biokemijskih in hematoloških parametrov pri pacientih, ki se zdravijo s hemodializo.

Metode: Raziskava je vključevala 25 pacientov na hemodializi, od teh je bilo 15 pacientov v začetni stopnji ledvične okvare (ZS;  $n=15$ ), 10 pacientov pa v napredovani stopnji ledvične okvare (NS;  $n=10$ ). Popolna krvna slika, koncentracija hemoglobina in hematološki indeksi (MCV, MCHC and MCH) so bili določeni s pomočjo hematološkega analizatorja Siemens Advia 120, koncentracije biokemijskih parametrov (sečnina, kreatinin, sečna kislina, celokupni proteini in  $K^+$ ) pa so bili izmerjeni s pomočjo avtoanalizatorja Pentra 200 LabTajm LTD. Na anonimni vprašalnik je odgovorilo 19 od 25 pacientov.

Rezultati: Signifikantne razlike med pacienti v začetni stopnji ledvične okvare in pacienti v napredovani stopnji ledvične okvare so se pokazale pri koncentraciji sečnine ( $\bar{x}_{ZS}=16.53$  mmol/l,  $\bar{x}_{NS}=31.36$  mmol/l;  $p<0.05$ ), kreatinina ( $\bar{x}_{ZS}=594.60$   $\mu$ mol/l,  $\bar{x}_{NS}=1369.95$   $\mu$ mol/l;  $p<0.05$ ), sečne kisline ( $\bar{x}_{ZS}=267.70$   $\mu$ mol/l,  $\bar{x}_{NS}=501.73$   $\mu$ mol/l;  $p<0.05$ ) in  $K^+$  ( $\bar{x}_{ZS}=4.71$  mmol/l,  $\bar{x}_{NS}=6.20$  mmol/l;  $p<0.05$ ). Med hematološkimi parametri so se signifikantne razlike pokazale le pri vrednostih MCH ( $\bar{x}_{ZS}=31.04$  pg,  $\bar{x}_{NS}=33.52$  pg;  $p<0.05$ ). 15 od 25 pacientov je bilo zaposlenih (privatni ali javni sektor). Rezultati vprašalnika so pokazali, da 35 % pacientov ne zmore maksimalnega dela v službi, 21 % pa meni, da so na določen način stigmatizirani v družbi in/ali v službi. 12 % pacientov je poročalo, da imajo podporo in razumevanje pri svojem delodajalcu zaradi njihovega zdravstvenega stanja.

Razprava in zaključki: Naši rezultati kažejo, da so biokemijski parametri bolj občutljivi v primerjavi z hematološkimi parametri pri zaznavanju stopnje ledvične odpovedi pri pacientih na hemodializi. Raven biokemijskih in hematoloških parametrov bi lahko potemtakem uporabili kot diagnostično orodje za ocenitev stopnje ledvične odpovedi. Take raziskave bi morale študente in znanstvenike, ki se ukvarjajo s tovrstno problematiko motivirati in vzpodbujati k nadaljnjim raziskavam in ozaveščanju ljudi s kronično boleznijo ledvic. Prav tako bi bile morebitne podporne skupine v kakršnikoli obliki zelo pomembne pri premagovanju stigmatizacije pacientov na hemodializi.

*Ključne besede:* biokemijski parametri, hemodializa, ledvična bolezen

## Biochemical and hematological parameters in determination of renal disease: effects on work ability

Damir Suljević, Lejla Klepo, Muhamed Fočak

Faculty of Science, Department of Biology, Zmaja od Bosne 33, 71000 Sarajevo, Bosna in Hercegovina

**Introduction:** Hemodialysis is common modality used to treat advanced and chronic kidney disease as a great public health problem, especially in developing countries. The progression of kidney damage is marked by the rise in concentration of several biochemical and hematological parameters whose evaluation contribute in renal function assessment. Hemodialysis affects many aspects of human life: functioning in society, work ability and general health status. The main aim of this research was to determine significant differences in concentration of biochemical and hematological parameters in patients on hemodialysis.

**Methods:** This study included 25 patients with renal complications on hemodialysis (patients with early stage of renal disease (ES, n=15) and patients with late stage of renal disease (LS, n=10). Complete blood count, hemoglobin concentration and hematological indexes (MCV, MCHC and MCH) were determined using Siemens Advia 120 hematological analyzer, while concentration of biochemical parameters (urea, creatinine, uric acid, total proteins and K+) were measured using autoanalyser Pentra 200 LabTajm LTD. An anonymous questionnaire was distributed to patients and 19 out of 25 completed it.

**Results:** Significant changes between patients with early and late stage of renal disease for concentration of following biochemical parameters were found: urea ( $\bar{x}_{ES}=16.53$  mmol/l,  $\bar{x}_{LS}=31.36$  mmol/l;  $p<0.05$ ), creatinine ( $\bar{x}_{ES}=594.60$   $\mu$ mol/l,  $\bar{x}_{LS}=1369.95$   $\mu$ mol/l;  $p<0.05$ ), uric acid ( $\bar{x}_{ES}=267.70$   $\mu$ mol/l,  $\bar{x}_{LS}=501.73$   $\mu$ mol/l;  $p<0.05$ ) and K+ ( $\bar{x}_{ES}=4.71$  mmol/l,  $\bar{x}_{LS}=6.20$  mmol/l;  $p<0.05$ ) concentrations. Among hematological parameters, significant difference was found only for MCH values ( $\bar{x}_{ES}=31.04$  pg,  $\bar{x}_{LS}=33.52$  pg;  $p<0.05$ ). Out of 25 patients, 15 of them were employed (private or public sector). The answers in the questionnaire showed that 35% of patients could not give their maximum at work, and 21% of them were stigmatized in a certain way in society and/or on work. In addition, only 12% responded that they had encountered a maximum understanding of their employer because of their health condition.

**Discussion and conclusions:** Our results showed that biochemical parameters are more sensitive compared to hematological parameters for detection of renal disease stage in patients on hemodialysis. By measuring blood values of these compounds, assessment of the renal excretory functions can be done and therefore levels of biochemical and hematological parameters can also be used as a diagnostic tool in assessment of renal diseases stage. This type of research should motivate and encourage students and scientists who are dealing with this area to perform further research and to raise up awareness of kidney disease in different aspects of life. Potentially, support groups in any form would be of great importance in overcoming the stigmatization of patients on hemodialysis.

**Key words:** biochemical parameters, hemodialysis, renal disease

## Depresija in delovanje kronično bolnih oseb v domačem okolju v smislu samopostrežbe

Stanisława Talaga<sup>1</sup>, Sara Stanczak<sup>1</sup>, Dominika Żądło<sup>2</sup>

<sup>1</sup> Faculty of Health Sciences, State College of Applied Sciences, ul. Staszica 1, 33-300 Nowy Sącz, Poland

<sup>2</sup> Akademia IGNATIANUM w Krakowie, ul. Kopernika 26,31-501 Kraków, Poland

**Uvod.** Incidenca depresije se poveča po 65 letu starosti. Ocenjuje se, da se pojavlja pri 15% starejših oseb. Žal napoved za Poljsko ni ugodna: pričakuje se, da se bo leta 2030 zvišalo število bolnih starejših oseb s 4,8 milijona na celo 8,5 milijona. Staranje družbe in povečanje življenjske dobe bosta tako vplivala na povečanje duševnih bolezni, vključno z depresijo. Soobstoj kroničnih bolezni bistveno poslabša delovanje telesa in je lahko eden glavnih vzrokov za depresijo. Cilj študije je bil ugotoviti razmerje med pojavom depresije in delovanjem kronično bolnih starejših oseb v domačem okolju.

**Material in metode.** V raziskavo je bilo vključenih 99 starejših ljudi v domačem okolju, ki so imeli kronično bolezen. Študija je bila izvedena leta 2019. Študija je bila izvedena s pomočjo naslednjih vprašalnikov: Lestvica za oceno osnovnih vsakodnevnih dejavnosti (angl. Scale for Assessing Basic Daily Activities; ADL), Lestvica za oceno kompleksnih vsakodnevnih dejavnosti (angl. Scale for Assessing Complex Daily Activities; IADL) in Beckove lestvice depresivnosti. Razlike med spremenljivkami smo preverili s testom neodvisnosti  $\chi^2$ , Studentovim t-testom in Pearsonovo linearno korelacijo. Stopnja pomembnosti p je bila postavljena na vrednost, ki je manjša ali enaka 0,05. Izračuni so bili izvedeni s programom IBM SPSS Statistica 13PL.

**Rezultati.** Resnost depresije se je pokazala statistično značilno odvisna ( $p=0,031$ ) od osnovnih bolezni preiskovancev. Več kot polovica starejših z blago do zmerno depresijo je imela pridružene revmatološke bolezni (53,33%). Starejši s hipertenzijo in diabetesom so predstavljali visok odstotek bolnikov s hudo depresijo. Starost preiskovancev je značilno ( $p < 0,001$ ) vplivala na opravljanje vsakodnevnih dejavnosti (ADL), funkcionalnost kompleksnih dejavnosti (IADL) in depresijo (Beckova lestvica). Čeprav je število sočasnih obolenj pri starejših značilno ( $p < 0,001$ ) vplivalo na njihovo funkcionalno kompleksnost (IADL), ni povezano z izvajanjem vsakodnevnih dejavnosti (ADL) in funkcionalnostjo kompleksnih dejavnosti (IADL).

**Sklepi.** V preučevani skupini so imeli ljudje z nizko učinkovitostjo pri opravljanju vsakodnevnih dejavnosti (ADL) in ljudje z nizko funkcionalnostjo kompleksnih dejavnosti (IADL) visoko stopnjo depresije.

**Ključne besede:** depresija, kronično bolni, starejši



## Depression of the chronically ill elderly and their functioning in domestic environment concerning self-service

Stanisława Talaga<sup>1</sup>, Sara Stanczak<sup>1</sup>, Dominika Żądło<sup>2</sup>

<sup>1</sup> Faculty of Health Sciences, State College of Applied Sciences, ul. Staszica 1, 33-300 Nowy Sącz, Poland

<sup>2</sup> Akademia IGNATIANUM w Krakowie, ul. Kopernika 26,31-501 Kraków, Poland

**Introduction.** The incidence of depression increases after the age of 65 years. It is estimated to occur in 15 % of the elderly. Unfortunately, the forecast is not favourable for Poland: it is expected that in 2030 there will be an increase in the number of sick elderly people from 4.8 million to even 8.5 million. The aging of the society and the increase in life expectancy will have an impact on the increase of mental diseases, including depression. The co-existence of chronic diseases significantly worsens the functioning of the body and can be one of the main causes of depression. The aim of the study was to find out the relationship between the occurrence of depression and the functioning of chronically ill elderly patients in the home environment.

**Material and methods.** The study included 99 elderly people living in the home environment who had a chronic disease. The study was conducted in 2019. The research was carried out by means of a diagnostic survey using a questionnaire technique and the following questionnaires: Scale for Assessing Basic Daily Activities (ADL), Scale for Assessing Complex Daily Activities (IADL) and Beck Depression Scale. The differences between the variables were verified using the  $\chi^2$  independence test, Student's t-test, and the Pearson's linear correlation. A significance level of p less than or equal to 0.05 was assumed. The calculations were carried out with the IBM SPSS Statistica 13PL program.

**Results.** The severity of depression depended statistically significantly ( $p=0.031$ ) on the underlying diseases of the subjects. More than half of the patients with mild to moderate depression suffered from rheumatic diseases (53.33%). Patients with hypertension and diabetes accounted for a high percentage of patients with severe depression.

The age of the examined patients had a significant ( $p < 0.001$ ) impact on their efficiency in performing everyday activities (ADL), the functionality of complex activities (IADL) and depression (Beck's Scale).

The number of co-morbidities in the examined patients had a significant ( $p < 0.001$ ) effect on their functional complexity (IADL). However, it did not correlate with the efficiency of everyday activities (ADL) and the functionality of complex activities (IADL).

**Conclusions.** In the study group, people with low efficiency in performing everyday activities (ADL) and people with low functionality of complex activities (IADL) had a high level of depression.

**Key words:** depression, chronically ill, the elderly

## Projekt STAR-VITAL: Preliminarni rezultati glede stresa in spanja pri zaposlenih

Matija Vodopivec, Ana Arzenšek

Univerza na Primorskem, Fakulteta za management, Cankarjeva ulica 5, 6000 Koper, Slovenija

Uvod: Kronični stres predstavlja pomembno obremenitev za posameznike, za delovne organizacije in za javnozdravstveni sistem. Doživljanje stresa na posameznem področju življenja vpliva na delovanje na drugih domenah. Stres na delovnem mestu se pojavi kot posledica razmer v organizaciji ali na delovnem mestu, ki jih posameznik doživlja kot ogrožajoče ali suboptimalne. Čeprav je stres lahko pomemben spodbujevalec ustvarjalnosti, proaktivnosti in učinkovitosti pri delu, je dolgotrajna in pogosta izpostavljenost stresorjem na delovnem mestu dejavnik tveganja za posameznikovo zdravje. Ko je posameznik soočen s stresorji, ki presegajo njegove/njene zaznane zmožnosti za spoprijemanje, se zmanjša posameznikovo blagostanje, pojavijo se lahko čustvene, kognitivne, vedenjske posledice ali celo bolj kompleksne zdravstvene motnje. Pogosto se kot posledica izpostavljenosti stresu pojavijo različne motnje spanja, ki se lahko kažejo preden nastopi spanec (nezmožnost zaspati), nočno prebujanje, prezgodnje zbujanje ali kot občutek nespočitosti. V prispevku predstavljamo preliminarne rezultate, povezane z občutenjem stresa in ocenjeno kakovostjo ter količino spanca pri zaposlenih, vključenih v projekt STAR-VITAL. Projekt temelji na spodbujanju slovenskih podjetij k izgradnji varnih in zdravih delovnih mest in delovnega okolja z namenom podaljšanja delovne aktivnosti za starejše zaposlene. Aktivnosti za podjetja so zasnovane na podlagi štirih stebrov zdravih delovnih mest pri Svetovni zdravstveni organizaciji, t.j. fizično delovno okolje, psihosocialno delovno okolje, lastni viri zaposlenih za zdravo življenje in sodelovanje z družbenim okoljem.

Metoda: V raziskavi je sodelovalo 834 udeležencev iz 27 slovenskih podjetij. Raziskava je potekala med junijem 2019 in februarjem 2020 in sicer na sedežih podjetij. Anketni vprašalnik je bil v obliki papir-svinčnik in v elektronski obliki.

Rezultati: Rezultati kažejo na zanimive trende, povezane z doživljanjem stresa in spanca pri udeležencih. Ugotovili smo, da zaposleni, ki poročajo o več stresa (tako na delovnem mestu kot v življenju nasploh) v povprečju poročajo o slabši kakovosti in količini spanca. Raziskava je pokazala tudi na to, da večina udeležencev kakovost svojega spanca doživlja kot srednje dobro ali precej dobro.

Razprava in zaključek: Glede na rezultate preliminarne raziskave sklepamo, da so stres (tako na delovnem mestu kot v življenju nasploh) in vzorci spanja pomemben dejavnik kakovosti življenja pri udeležencih raziskave. Vodstvom vključenih podjetij svetujemo, da redno spremljajo dejavnike, ki zaposlenim predstavljajo vire stresa na delovnem mestu ter uveljavijo prakse, ki zmanjšajo vire stresa. Nenazadnje vodstva podjetij in posamezne zaposlene spodbujamo tudi k odgovornemu ravnanju in skrbi za lastno zdravje s krepitvijo lastnih virov za spoprijemanje s stresom ter skrbijo za higieno spanja.

*Ključne besede:* projekt STAR-VITAL, spanje, stres, zaposleni, zdravje na delovnem mestu

## **STAR-VITAL project: Preliminary results regarding employee stress and sleep**

*Matija Vodopivec, Ana Arzenšek*

*University of Primorska, Faculty of management, Cankarjeva ulica 5, 6000 Koper, Slovenia*

**Introduction:** Chronic stress represents a significant burden for individuals, work organizations and the public health system. Stress in one sphere of life affects functioning in other domains. Workplace stress occurs as a result of organizational or workplace situations that an individual experiences as threatening or suboptimal. Although stress can be an important driver of creativity, proactivity and efficiency at work, prolonged and frequent exposure to workplace stressors is a risk factor for an individual's health. When an individual is confronted with stressors beyond his/ her perceived coping abilities, the individual's well-being is diminished and emotional, cognitive, behavioral consequences or more complex health disorders might be developed. For example, sleep disorders might occur in the form of inability to fall asleep, as nighttime awakening, as premature awakening, or as a feeling of tiredness. This paper presents preliminary results related to self-reported stress and the estimated quality and quantity of sleep among employees involved in the STAR-VITAL project. The project is based on encouraging Slovenian companies to build safe and healthy work environments, with the aim of prolonging the employment of older employees. Activities for companies are based on the four pillars of healthy jobs at the World Health Organization, i.e. physical work environment, psychosocial work environment, employees' own resources for healthy living and collaboration with the social environment.

**Method:** 834 participants from 27 Slovenian companies took part in the survey. The survey was conducted between June 2019 and February 2020 on-site at the participating firms. The questionnaire was in paper-and-pencil format and in electronic form.

**Results:** The results indicate interesting trends related to the experience of stress and sleep patterns in the participants. Employees who report more stress (work-related and in general) tend to report poorer quantity and quality sleep. We also found that majority participants perceived the quality of their sleep as good or fairly good.

**Discussion and conclusions:** Based on the results of the preliminary study, we conclude that stress (both at work and in life in general) and good quality sleep are important determinants of life quality. Managers at participating firms are advised to regularly monitor the factors that represent employees' sources of workplace stress and implement practices that reduce the sources of stress. Last but not least, business leaders and individual employees are encouraged to act responsibly and take care of their own health by strengthening their own resources to cope with stress and maintaining sleep hygiene.

**Key words:** STAR-VITAL project, sleep, stress, employees, occupational health

## Poklicna in telesna dejavnost nosečnic

*Bogumiła Lubińska-Żądło, Patrycja Szubryt, Bożena Kowalczyk  
Faculty of Health Sciences, Podhale State College of Applied Sciences,  
ul. Kokoszków 71, 34-400 Nowy Targ, Poland*

Uvod. Nosečnost je posebno obdobje v življenju ženske. Glavni dejavnik, ki ima bistven vpliv na njen potek, je življenjski slog nosečnice. Pri tem je pomemben dejavnik telesna aktivnost, ki s seboj prinese veliko pozitivnih učinkov za materino telo, katerega preobremenjenost se s potekom nosečnosti povečuje.

Cilj. Namen študije je bil oceniti poklicno in telesno dejavnost nosečnic.

Material in metode. V raziskavi je sodelovalo 174 nosečnic, ki so se udeležile tečaja za nosečnice. Raziskava je potekala od januarja do aprila 2019. Izvedena je bila raziskava z uporabo vprašalnikov, orodji pa sta bili avtorjev vprašalnik in vprašalnik o telesni dejavnosti nosečnic (PPAQ-PL). Statistične analize so bile razvite v programu IBM SPSS Statistics 20 z vnaprej postavljenjo stopnjo značilnosti  $\alpha=0,05$ .

Rezultati. Telesna dejavnost je močno odvisna od socio-demografskih podatkov, kot so: starost ( $p < 0,001$ ), izobrazba ( $p < 0,001$ ), zakonski status ( $p < 0,001$ ) in kraj bivanja ( $p < 0,001$ ). Poklicna dejavnost je statistično značilno odvisna od celotne telesne aktivnosti in posameznih kategorij telesne dejavnosti.

Sklepi. Socio-demografski podatki, kot so starost, izobrazba, kraj bivanja in zakonski status, so imeli pomemben vpliv na poklicno in telesno dejavnost. Nižja izobrazba ali nižji ekonomski status sta bila razlog za prenehanje opravljanja poklicne dejavnosti nosečnic.

*Ključne besede: nosečnica, telesna aktivnost, poklicna dejavnost, vprašalnik PPAQ*

## Professional and physical activity of pregnant women

*Bogumiła Lubińska-Żądło, Patrycja Szubryt, Bożena Kowalczyk  
Faculty of Health Sciences, Podhale State College of Applied Sciences,  
ul. Kokoszków 71, 34-400 Nowy Targ, Poland*

**Introduction.** Pregnancy is a special period in woman's life. The main factor that has a huge impact on its course is the lifestyle of a pregnant woman. Its important element is physical activity, which brings with itself a lot of positive benefits for the mother's body, whose overload increases with the development of pregnancy.

**The aim.** The aim of the study was to assess the physical activity and the professional activity of pregnant women.

**Material and methods.** The study involved 174 pregnant women participating in childbirth classes. The research was carried out from January to April 2019. The method was a diagnostic survey using the questionnaire technique, and the tools were an author's questionnaire and a questionnaire on physical activity of pregnant women (PPAQ-PL). Statistical analyzes were developed in the IBM SPSS Statistics 20 program with the assumed significance level of  $\alpha=0.05$ .

**Results.** General physical activity is significantly dependent on socio-demographic data such as: age ( $p < 0.001$ ), education ( $p < 0.001$ ), marital status ( $p < 0.001$ ), and place of residence ( $p < 0.001$ ). Occupational activity significantly depends on the overall physical activity and individual categories of physical activity.

**Conclusions.** Socio-demographic data such as age, education, place of residence and marital status had a significant impact on both professional and physical activity. A lower education or lower economic status was the reason for stopping the professional activity of pregnant women.

**Key words:** pregnant woman, physical activity, professional activity, PPAQ questionnaire

*Zdravje delovno aktivne populacije*  
*Health of the Working-Age Population*

4. znanstvena in strokovna konferenca z mednarodno udeležbo, 18. september 2020

4<sup>th</sup> scientific and professional international conference, 18<sup>th</sup> September 2020

Zbornik povzetkov z recenzijo / Book of Abstracts

Uredila / Edited by Ana Petelin

Recenzenti / Reviewers ▪ Patrik Pucer, Boštjan Žvanut, Nejc Šarabon, Matej Voglar,  
Denisa Manojlovič, Dorjana Zerbo Šporin, Mirko Prosen, Sabina Ličen, Igor Karnjuš,  
Urška Bogataj, Doroteja Rebec, David Ravnik, Ana Petelin, Karin Novak, Darja Barlič-  
Maganja, Boris Kovač, Ester Benko, Matej Plevnik, Urška Čeklič, Klemen Širok

Oblikovanje in prelom / Design and Typesetting ▪ Jonatan Vinkler

Izdajatelj/Published by ▪ Založba Univerze na Primorskem/University of Primorska Press  
Titov trg 4, SI-6000 Koper (zanjo/for publisher: prof. dr. Klavdija Kutnar, rektorica)  
Koper 2020

Glavni urednik/Editor-in-Chief ▪ Jonatan Vinkler

Vodja založbe/Managing Editor ▪ Alen Ježovnik

ISBN 978-961-293-017-2 (PDF)

<http://www.hippocampus.si/ISBN/978-961-293-017-2.pdf>

ISBN 978-961-293-018-9 (HTML)

<http://www.hippocampus.si/ISBN/978-961-293-018-9/index.html>

DOI: <https://doi.org/10.26493/978-961-293-017-2>

© 2020 Založba Univerze na Primorskem/University of Primorska Press





