

Original scientific article/Izvirni znanstveni članek

Expert opinions about the use of comprehensive nutrition protocol in practice for obesity prevention

Mnenje strokovnjakov o uporabi celostnega prehranskega protokola v praksi pri preprečevanju debelosti

Mojca Bizjak, Melita Peršolja, Lidija Zadnik Stirn

Key words: obesity; nutrition assessment; protocol; dietitians; decision support techniques

Ključne besede: debelost; prehranska ocena; protokol; dietetiki; tehnike za podporo odločanju

Senior Lecturer Mojca Bizjak, PhD, MSc, BSc

*Correspondence e-mail/
Kontaktirni e-naslov:*
mojca.bizjak@fvz.upr.si

Assistant Professor Melita Peršolja, PhD, MSc, BsN, RN

Both/Obe:
University of Primorska,
Faculty of Health Sciences,
Polje 42, 6310 Izola, Slovenia

Professor Lidija Zadnik Stirn, PhD, MSc, BSc.; University of Ljubljana, Biotechnical Faculty, Jamnikarjeva 101, 1000 Ljubljana, Slovenia

The article is based on Mojca Bizjak doctoral dissertation: *Creation of a comprehensive nutrition protocol in obesity prevention* (2016). Članek temelji na doktorskem delu Mojce Bizjak: *Oblikovanje celostnega prehranskega protokola pri preprečevanju debelosti* (2016).

Received/Prejeto: 26. 5. 2016
Accepted/Sprejeto: 30. 8. 2016

ABSTRACT

Introduction: Obesity is associated with a number of chronic diseases. The research aimed to determine the effectiveness of nutrition assessment when using a comprehensive nutrition protocol at primary health service.

Methods: A real life situation was analysed for the positive and negative factors in the newly formed comprehensive nutritional protocol. These factors were identified by a group decision-making and a SWOT Analysis (Strengths, Weaknesses, Opportunities and Treats) and subsequently numerically evaluated with the Analytic Hierarchy Process method which included expert opinions.

Results: According to experts, the most important factors justifying the introduction of the protocol in practice are "equal treatment for all subjects" and "precisely prepared manual", followed by "individual treatment" and "health status improvements". The two most important negative factors are "dependence on other professionals" and "subjects will not be able to follow the protocol".

Discussion and conclusion: Expert opinions favour the introduction of nutrition protocol in clinical practice to ensure equal treatment of all subjects, and enhance obesity prevention with the accompanying detailed instructions. For this reason, further research should address the foundation of dietetic counselling services at the primary level of healthcare, so that physicians could refer obese people to individual nutritional therapy, which may reduce the prevalence of obesity.

IZVLEČEK

Uvod: Debelost je povezana s številnimi kroničnimi boleznimi. Analizirana je bila situacija v realnem okolju, to je zdravstvenemu timu na primarni ravni, v primeru, če bi natančno opisan celostni prehranski protokol za obravnavo debelosti vneljali v prakso.

Metode: Z opravljenim skupinskim odločanjem v fokusni skupini in rojdem SPIN (Slabosti, Prednosti, Izzivi in Nevarnosti) so bili definirani pozitivni in negativni dejavniki na novo oblikovanega celostnega prehranskega protokola, ki so bili nato z metodo analitičnega hierarhičnega procesa, ki vključuje mnenje ekspertov, numerično ovrednoteni.

Rezultati: Ugotovljeno je bilo, da sta po mnenju ekspertov najpomembnejša dejavnika, ki vplivata na prednosti uvedbe prehranskega protokola v prakso, »enakovredna obravnava vseh preiskovancev« in »natančno pripravljena navodila«. Poleg tega sta pozitivna dejavnika še »individualna obravnava« in »izboljšanje zdravstvenega stanja ljudi«. Dva najpomembnejša negativna dejavnika sta »odvisnost od drugih strokovnjakov« in prepričanje, da »preiskovanci ne bodo zmogli slediti protokolu«.

Diskusija in zaključek: Mnenje strokovnjakov je pokazalo potrebo po prehranskem protokolu v klinični praksi, ki bi zagotovil enakovredno obravnavo vseh preiskovancev ter z natančno pripravljenimi navodili, izboljšal uspešnost pri preprečevanju debelosti. Nadaljnje delo bi bilo smiselno usmeriti v vzpostavitev prehranskih posvetovalnic na primarni ravni zdravstvenega sistema, kjer bi lahko zdravniki napolili osebe z debelostjo na individualno prehransko obravnavo, kar bi lahko zmanjšalo prevalenco debelosti.

Introduction

Obesity is associated with many chronic diseases. Due to the rapid increase in the prevalence of overweight and obesity and high costs of treatment, it is necessary to determine how to effectively treat this condition. Long-term positive energy balance leads to obesity, and negative energy balance is one of the most important actions in weight loss (Hamer & Mishra, 2010). Dietitians are experts who can be included in a medical team and the nutrition care process can reduce the prevalence of obesity (AND, 2006; Lau, et al., 2007; NICE, 2014). The role of a dietician is well known and dietitians have already been included in the obesity management treatments (Lacey & Pritchett, 2003; Johns, et al., 2014; Raynor & Champagne, 2016). A dietician uses a nutritional protocol, a formal description of the tasks and procedures to be used during nutritional therapy. The American Academy of Nutrition and Dietetics suggests the following steps in the nutrition care process: nutrition assessment, nutrition diagnosis, nutrition intervention, nutrition

monitoring and evaluation (Lacey & Pritchett, 2003). Individual steps are interrelated and have different roles. A carefully prepared protocol is an important tool used by dietetics professionals to provide individual nutrition care in the process of treating obesity and changing behavioural risk factors. Dietitians, working in a multidisciplinary team, are clinically and cost effective in the management of overweight and obesity (BDA, 2016, p. 1). In Slovenia, the situation is still fairly uncertain as there are no established positions for dietitians. The Health Insurance Institute of Slovenia does not cover the costs of nutritional therapy, even though the Resolution on the National Program on Nutrition and Physical Activity for Health 2015 – 2025 considers a dietitian an important member of the healthcare team (Ministry of Health, 2015). The study programme in Dietetics was introduced in Slovenia in the year 2007. There are approximately 100 graduate dietitians and 13 masters in dietetics. The profession of dietitian is a regulated profession in the Republic of Slovenia (Ministry of Health, 2016), but it is still rarely a member of a health team. At the primary healthcare

Table 1: *Obesity prevention nutrition protocol (Bizjak, 2016, p. 44)*

Tabela 1: *Celostni prehranski protokol pri preprečevanju debelosti (Bizjak, 2016, p. 44)*

<i>Sequence of tasks/ Zaporedje dejavnosti</i>	<i>Description of activity/ Opis dejavnosti</i>	<i>Performers/ Izvajalci</i>
1	Precise written instructions for subjects on the day of measurement	Physician or dietitian
2	Resting metabolic rate measurement (RMR), using indirect calorimetry	Dietitian and subject
3	Height, waist and hip measurements	Dietitian or nurse and subject
4	Body mass and body composition, using bioelectrical impedance analysis	Dietitian or nurse and subject
5	Blood pressure measurement	Nurse and subject
6	Venous blood samples for biochemical analysis	Nurse and subject
7	Biochemical and hormonal analysis (glucose, triglycerides, total cholesterol, low-density lipoprotein (LDL cholesterol), high-density lipoprotein (HDL cholesterol), C-reactive protein (CRP), adipokines)	Laboratory
8	Lunch break for fasting subjects	Subject
9	Food history	Dietitian and subject
10	Survey questionnaires: dietary habits questionnaire, food list, binge eating questionnaire	Dietitian and subject
11	Lumbar and flexor endurance test	Dietitian, nurse and subject
12	Instructions for food record and recording physical activity	Dietitian and subject
13	Recording food and physical activity	Subject
14	Data analysis and calculation – part 1	Dietitian
15	Food frequency questionnaire (FFQ)	Dietitian and subject
16	Food record overview	Dietitian and subject
17	Nutritional counselling - general	Dietitian and subject
18	Data analysis and calculation – part 2	Dietitian
19	Data input in DEXi - model	Dietitian
20	Determining the date of consultation	Dietitian
21	Individual plan preparation	Dietitian
22	Individual dietary counselling	Dietitian and subject

Legend/Legend: DEXi - a computer programme for multi-attribute decision making/računalniški program za večparametrsko odločanje.

level there are no dietitians at all. In Slovenia the CINDI workshops conducted programmes for the prevention of cardiovascular disease, which promote healthy eating (Hlastan Ribič & Maučec Zakotnik, 2013). However, these programmes are not designed to treat individuals and dietitians are not included.

A comprehensive protocol for the prevention of obesity "Obesity prevention nutrition protocol", developed by Bizjak (2016), was first used in Slovenia in a group of 48 people (subjects). The author emphasises that all the activities from protocol must be performed in order to carry out a high quality nutritional intervention (Table 1) when used in primary healthcare services. This article aims to assess positive and negative factors of the implementation of dietitians' work in the medical team, using a comprehensive nutritional protocol in treating obesity.

Aims and objectives

The aim of the research was to determine the advantages, opportunities, weaknesses and threats of comprehensive nutrition protocol when used in practice, based on expert opinions. The present study explored the complex issues which could be resolved with the expert knowledge and addressed the following research questions: (a) Is the introduction of a dietitian specialist in primary level health teams feasible? (b) What are the advantages and threats of internal and external environment, if the obesity prevention nutrition protocol were introduced in practice?

Methods

A qualitative research method was employed in the study. The data were collected using semi-structured interviews in five facilitated group discussions.

Description of the research instrument

The data were collected through focus groups, organised for research purposes and monitored by a researcher. The facilitator encouraged the group to discuss complex questions and generate information on participants' views. It was noted that experts can create a real-life situation (van Steenkiste, et al., 2002). Five open-ended questions were framed for discussion and data collection. Strengths, Weaknesses, Opportunities and Treats (SWOT) analysis is a tool for analysing external and internal environments - strengths, weaknesses, opportunities and threats. In order to analyse the usefulness, the internal and external environment must be analysed. The internal environment includes strengths and weaknesses that can influence a person's activity. Opportunities are external circumstances that enable the achievement of the objectives and threats are those factors in the external environment that may hinder the

achievement of the desired objectives (Whalley, 2010). The SWOT-matrix in this study is based on the factors identified by our expert group. Since SWOT analysis does not provide numerical results to determine the importance of individual factors that could effect the introduction of dietitian protocol into practice, a new model was developed. The latter combined the SWOT factors with Analytic Hierarchy Process (AHP), with numerically evaluated results. The AHP is a method that can help in assessing quantitative and qualitative criteria in complex decision operations (Saaty, 2007). It is a multicriteria decision-making technique that may express the general decision operation by decomposing a complicated problem into a multilevel hierarchical structure of the objectives, criteria and alternatives. The essence of the AHP-method is a comparison of all the elements in pairs, at the same level in the decision-tree. A series of complex questions, to which we do not have exact answers, are provided to the relevant professionals, assuming that experts can well predict a real situation (van Steenkiste, et al., 2002). A scale 1 to 9 scale was used for a comparison of all the elements in pairs at the same level (SWOT-factors/categories) in the decision-tree (Table 2). On the basis of personal knowledge, experts expressed the difference between the compared parameters (Figure 1).

Description of a sample

Competent and experienced professionals in the field of nutrition counselling - dietetics and health were invited to participate in the preparation of the dietetics study program and integration of the profession among health workers at the national level. The experts are university teachers of dietetics, mostly doctoral degree holders. There are fewer than ten dietetics experts in Slovenia who can carry out the processes in the nutritional protocol, four out of which were selected ($n = 4$) by convenience. Two of them are members of the Slovenian Association of Nutritionists and Dietitians and the European Federation of Association of Dietitians, with extensive experience from the relevant field.

Description of the research procedure and data analysis

The study was approved by the National Medical Ethics Committee on January 6th, (56/08/11 bis). Factor identification that composes the SWOT-matrix was followed by pairwise comparison of all the criteria. The experts determined which comparative criterion makes a major contribution to an individual factor, and what is the difference between the compared criteria. We obtained pairwise comparisons estimates, which were further used to calculate the utility functions at individual levels of the decision tree.

Figure 1: Example of a questionnaire for the evaluation of SWOT-matrix with paired comparison of factors
 Slika 1: Primer vprašalnika parnih primerjav SPIN-dejavnikov

Analysis of threats of nutritional protocol

Evaluate the importance of various factors in the threats of introduction of a nutritional protocol:

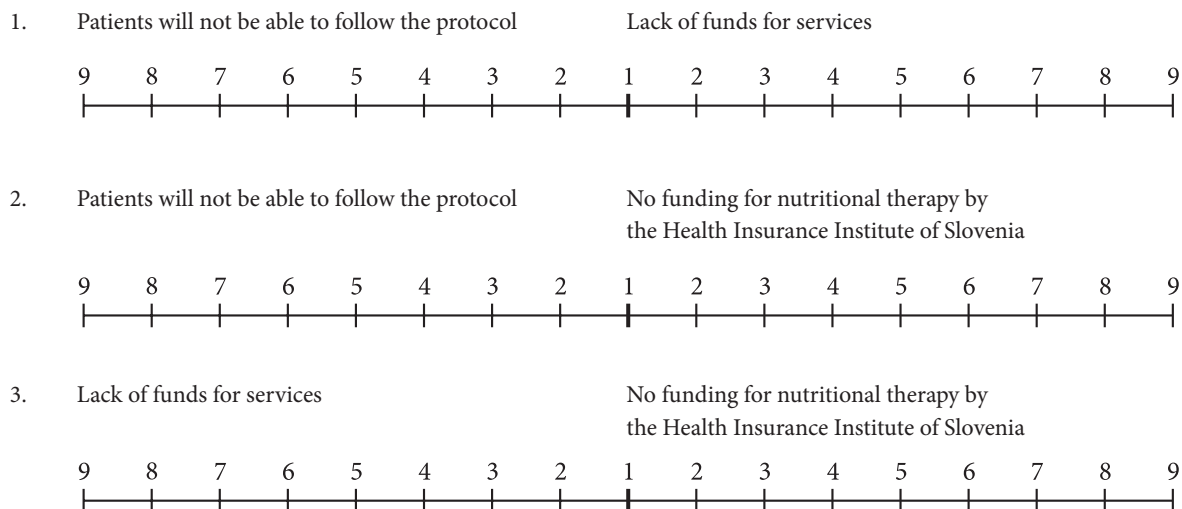


Table 2: Scale of relative comparisons (Saaty, 1994, p. 73)

Tabela 2: Lestvica relativnih primerjav (Saaty, 1994, p. 73)

Importance a_{ij} / Pomembnost a_{ij}	Definition/ Opredelitev	Explanation/ Razlaga
1	Equal importance	Criteria i and j contribute equally to the objective
2	Slight	
3	Slight difference in importance	Criteria i and j slightly favour one over the other
4	Medium	
5	Medium difference in importance	Criteria i and j moderately favour one over the other
6	Big	
7	Big difference of importance	Criteria i and j strongly favour one over the other
8	Very big	
9	Absolute difference of importance	Criteria i and j are on the highest possible order of difference of importance of one over the other

Legend/Legenda: a_{ij} – value obtained when comparing criterion i with criterion j /ocena ki jo dobimo, ko primerjamo kriterij i , s kriterijem j

If the criterion i is assessed and compared with j , using the evaluation a_{ij} , the inverse score $1/a_{ij}$ is a measure of the opposite comparison. Pairwise comparison results can be shown by a square and reciprocal matrix. We used the Geometric Mean Method (GMM) (Grošelj, 2013) in the AHP group assessment method, which combines individual assessments into an aggregated pairwise matrix.

The estimated values are entered into the matrix with pairwise comparisons, given as the matrix A (Lipušček, et al., 2003). The matrix of pairwise comparisons A is a square, positive reciprocal matrix in which the diagonal values are equal to 1 and the

symmetric values are inverse. If $CR < 0.1$, the data in the pairwise comparisons matrix are harmonized and reliable results may be expected in a multi-attribute decision-making model (Saaty, 2007).

Results

The experts highlighted the difference between the compared parameters and formed the assessment criteria in relation to all categories of the SWOT-matrix. By means of SWOT analysis, the strengths, opportunities, weaknesses and threats of the newly formed nutrition protocol were identified (Table 3).

Table 3: SWOT factors of comprehensive nutritional protocol in obesity prevention

Tabela 3: SPIN dejavniki celostnega prehranskega protokola pri preprečevanju debelosti

Strengths (S)/Prednosti (P)	Weaknesses (W)/Slabosti (S)
meticulously prepared manual individual treatment equal treatment for all subjects shorter response times lower costs of treatment	dependency on other experts lack of interest of the management for nutritional therapy implementation lack of funding for equipment and analysis there are no established posts for dietitians in primary healthcare
Opportunities (O)/Izzivi (I)	Threats (T)/Nevarnosti (N)
integration and cooperation in various disciplines reducing the cost of treatment health status improvements implementation of the Resolution on the National Programme on Nutrition and Physical Activity for Health 2015 - 2025 objectives (Ministry of Health, 2015)	subjects will not be able to follow the protocol lack of funds for services no funding for nutritional therapy by the Health Insurance Institute of Slovenia

Table 4: Aggregated matrix - geometric mean of all the experts' assessments

Tabela 4: Skupna matrika - geometrijska sredina ocen vseh deležnikov

	Strengths/Prednosti	Opportunities/Izzivi	Weaknesses/Slabosti	Threats/Nevarnosti
Strengths/ Prednosti	1	1.57	3.72	2.91
Opportunities/ Izzivi	0.64	1	0.64	2.71
Weaknesses/ Slabosti	0.27	1.57	1	1.19
Threats/ Nevarnosti	0.34	0.37	0.84	1

Table 5: Importance of categories and factors in nutrition protocol establishment

Tabela 5: Pomembnost kategorij in dejavnikov za uvedbo prehranskega protokola

SWOT categories/ Kategorija SPIN	Group rating/ Ocena skupine	SWOT factors/ Dejavniki SPIN	Factor priority within the group/ Ocena posameznih dejavnikov	Overall priority/ Skupna ocena
Strengths/ Prednosti	0.441	Meticulously prepared manual	0.254	0.112
		Individual treatment	0.245	0.108
		Equal treatment for all subjects	0.312	0.138
		Shorter response times	0.113	0.050
		Lower costs of treatment	0.076	0.034
Weaknesses/ Slabosti	0.195	Dependence on other professionals	0.361	0.070
		Lack of interest of the management for nutritional therapy implementation	0.248	0.048
		Lack of funding for equipment and analysis	0.247	0.048
		There are no established working places for dietitians in primary healthcare	0.144	0.028
Opportunities/ Izzivi	0.239	Integration and cooperation among various disciplines	0.230	0.055
		Reducing the cost of treatment	0.224	0.054
		Health status improvements	0.428	0.102
		Implementation of Resolution on the National Programme on Nutrition and Physical Activity for Health 2015 - 2025 objectives (Ministry of Health, 2015)	0.118	0.028
Threats/ Nevarnosti	0.125	Subjects will not be able to follow the protocol	0.534	0.067
		Lack of funds for services	0.195	0.024
		No funding for nutritional therapy by the Health Insurance Institute of Slovenia	0.271	0.034

The AHP-group method was performed with aggregation of individual ratings that are equally important. For an overall assessment, GMM was used to calculate the geometric mean of all the experts' assessments and an aggregation pairwise comparisons matrix was prepared (Table 4).

The data in the pairwise comparisons matrix are consistent ($CR = 0.09$). The importance of individual SWOT categories was determined as shown in Table 5.

The analysis based on the expert opinion reveals that the primary factors contributing to the nutritional benefits of the introduction of the protocol in practice are "equality of treatment of all subjects" and "carefully prepared instructions", followed by "individual treatment" and "improving the health status of people".

Discussion

Using a SWOT-AHP model, we analysed our comprehensive nutritional protocol. The basic aim of the model was to establish strategies for the introduction of innovations such as those observed by other authors (Görener, et al., 2012). The introduction of a protocol into practice requires research strategies. Using SWOT - analysis, the positive aspects (strengths and opportunities) and negative aspects (weaknesses and threats) of a designed comprehensive nutritional protocol for the prevention of obesity were analysed. When drawing up the decision tree, we considered all the relevant factors that may affect the application of a comprehensive nutritional protocol for the prevention of obesity in a very complex situation in Slovenia where a dietitian is rarely a member of multidisciplinary healthcare team. In such situation it should be observed that patients are individuals and that the quantity of food they consume cannot be determined unless the value of resting metabolic rate is identified (Nieman, et al., 2003; St-Onge, et al., 2004). Thus, in the present comprehensive nutrition protocol, the measurement of resting metabolic rate is the basis for the preparation of a nutritional plan from which a health professional can design individual menus and manage energy balance. Due to accurately prepared protocol all patients go through the same protocol, providing equal treatment for all. We have prepared a work protocol that could be included in the primary level of the health service, including a dietitian in the multidisciplinary healthcare team. Using SWOT - AHP analysis, numerical values for individual factors were calculated. Further on, the values using a group method to define decision utility functions were synthesized. Based on the experts' opinions, pairwise comparisons were evaluated for utility functions calculated at individual levels of the AHP decision tree. In addition, we determined which of the compared criteria makes a major contribution to an individual factor and the difference between the compared criteria. According to the experts, the

most important factors that affect the nutritional benefits of the introduction of the protocol into practice are "equal treatment for all subjects" and "precisely prepared manual". Table 5 shows that positive effects dominate. In addition to the "equal treatment for all subjects" and "precisely prepared manual", "individual treatment" and "health status improvements" are also positive factors. The first two negative factors are in the fifth and sixth place: "dependence on other professionals" and "subjects will not be able to follow the protocol".

Limitations of the study

This study was designed for the Slovenian environment and situation that applies to nutritional treatment in Slovenia. This should be taken into consideration when interpreting the results.

Conclusion

The article demonstrates there is a need for nutritional protocols that will ensure equal treatment for all subjects. Nutritional therapy in Slovenia is still in the developing process. Individual treatment usually depends on an expert's assessment decision instead on the evidence-based guidelines. The access to nutritional counselling information is sometimes based solely on the patient engagement. Therefore, precisely prepared manual which establishes equal treatment for all subjects is needed. This will then facilitate the work of individual experts and enable them to devote time to individual diet plan treatment and focus on the goals of improving patients' health. However, introduction of innovations is consequently faced with challenges. Dietitians must work together with other experts from various professional fields. Implementation of nutritional therapy depends on the exchange of information and collaboration of these experts. Changing behavioural factors is a demanding task for patients. Unfortunately, the current situation in Slovenia does not allow dietitians to be part of the medical team at the primary level. So individual nutritional treatment is not a part of a diet it therapy for overweight or obese people, although is well known that proper diet can reduce risk factors of non-communicable chronic diseases. Our proposition is to establish dietetic counselling services at the primary healthcare level allowing physicians to refer obese people to nutritional therapy. Further research could focus on the evaluation of potential financial benefits of dietitians' work on the cost of medical treatment in Slovenia. We assume that in Slovenia, as well as elsewhere, the dietitians' collaboration in a healthcare team can reduce the prevalence of obesity and the cost of treatments of non-communicable chronic diseases.

Saaty, T.L., 1994. *Fundamentals of decision making and priority theory: with the analytic hierarchy process*. Pittsburgh: RWS Publications, p. 73.

Saaty, T.L., 2007. *Fundamentals of decision making and priority theory with the analytic hierarchy process*. Pittsburgh: RWS Publications, pp. 121–130.

St-Onge, M.P., Rubiano, F., Jones, A.Jr. & Heymsfield, S.B., 2004. A new hand-held indirect calorimeter to measure postprandial energy expenditure. *Obesity Research*, 12(4), pp. 704–709. <http://dx.doi.org/10.1038/oby.2004.82>
PMid:15090640

van Steenkiste, B.C., Jacobs, J.E., Verheijen, N.M., Levelnik, J.H. & Bottema, B.J.A.M., 2002. A Delphi technique as a method for selecting the content of an electronic patient record for asthma. *International Journal of Medical Informatics*, 65(1), pp. 7–16. [http://dx.doi.org/10.1016/S1386-5056\(01\)00223-4](http://dx.doi.org/10.1016/S1386-5056(01)00223-4)
PMid:11904244

Whalley, A., 2010. *Strategic Marketing*. [S. l.]: A. Whalley & Ventus Publishing ApS, pp. 66–67. Available at: <http://library.ku.ac.ke/wp-content/downloads/2011/08/Bookboon/Strategy/strategic-marketing.pdf> [1. 9. 2016].

Cite as/Citirajte kot:

Bizjak, M., Peršolja, M. & Zadnik Stirn, L., 2016. Expert opinions about the use of comprehensive nutrition protocol in practice for obesity prevention. *Obzornik zdravstvene nege*, 50(3), pp. 224–231. <http://dx.doi.org/10.14528/snr.2016.50.3.97>