

PERCEIVED WORK ABILITY INDEX OF PUBLIC SERVICE EMPLOYEES IN RELATION TO AGEING AND GENDER: A COMPARISON IN THREE EUROPEAN COUNTRIES

INDEKS ZAZNAVANJA DELOVNE ZMOŽNOSTI ZAPOSLENIH OSEB V JAVNIH SLUŽBAH GLEDE NA STARANJE IN SPOL: PRIMERJAVA TREH EVROPSKIH DRŽAV

Nurka PRANJIC^{1*}, Juan Manuel Garcia GONZALES², Ljiljana CVEJANOV-KEZUNOVIĆ³

¹University of Tuzla, Medical Faculty, Occupational Medicine,
Univerzitetaska 1, 75000 Tuzla, Bosnia and Herzegovina

²University Pablo de Olavide, Department of Sociology, 41013 Seville,
Edifice 14, Pl. 2, Despach 27, Spain

³University of Monte Negro, Medical Faculty, Department of Family Medicine,
Ljubljanska BB, 81 000 Podgorica, Monte Negro

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ABSTRACT

Keywords:

ageing, gender, work ability, public sector employees

Background: Increasing longevity raised the prospect of a workplace for ageing workers. Previous studies reveal that work ability decreases with age, even among the healthy, and decreased significantly with age among women. The aim of the study is to examine the perception of work ability of public sector employees aged 55 years and older and gender differences in three European countries.

Methods: A prospective longitudinal study design and standardized "Work Ability Index" (WAI) were used. This study analysed the relationship between ageing, gender, and perceived work ability among 1653 employees aged 45.06±10.90 years (562 men and 1091 women) from Spain, Bosnia and Herzegovina and Monte Negro. The research was conducted in 2018.

Results: Older employees had a better WAI than their younger colleagues ($P < 0.001$). The lowest prevalence rate 20% of excellent WAI was between 35 and 44 years of age. The reduction of WAI in Bosnia and Herzegovina was huge 68%, compared with 30% in Monte Negro (more than 2 times) and 14% in Spain (almost 5 times more).

Conclusion: Gender and age was not protector and predictor of excellent or reduced work ability. Work ability did not decrease with age among women and men, public sector employees. Work ability depends of health and safety, promotion and preventive activities at the workplace.

IZVLEČEK

Ključne besede:

staranje, spol, delovna zmožnost, zaposleni v javnem sektorju

Ozadje: Daljša življenjska doba je izboljšala možnosti za delovno mesto zaposlenih oseb, ki se starajo. Prejšnje študije so razkrile, da se delovna sposobnost zmanjšuje s starostjo tudi med zdravimi osebami in da se izrazito zmanjšuje s starostjo med ženskami. Cilj študije je pregled dojemanja delovne sposobnosti zaposlenih oseb v javnem sektorju s starostjo 55 let ali več in razlik med spoloma v treh evropskih državah.

Metode: Uporabljena sta bila prospektivna longitudinalna oblika študije in standardiziran »indeks delovne zmožnosti« (WAI). Ta študija je analizirala odnos med staranjem, spolom in zaznano delovno zmožnost med 1653 zaposlenimi osebami, starimi 45,06 ± 10,90 let (562 moških in 1091 žensk) iz Španije, Bosne in Hercegovine in Črne gore. Raziskava je bila opravljena leta 2018.

Rezultati: Starejše zaposlene osebe so imele boljši indeks WAI kot njihovi mlajši kolegi ($P < 0,001$). Najnižjo stopnjo razširjenosti, 20 % odličnega indeksa WAI, je imela starostna skupina od 35 do 44 let. Zmanjšanje indeksa WAI v Bosni in Hercegovini je bilo ogromnih 68 %, v primerjavi s 30 % v Črni gori (več kot dvakratna vrednost) in 14 % v Španiji (več kot skoraj petkratna vrednost).

Zaključek: Spol in staranje ne ščitita niti predvidevata odličnosti ali zmanjšanja delovne zmožnosti. Delovna zmožnost se ni zmanjšala s starostjo med ženskami in moškimi, zaposlenimi v javnem sektorju. Delovna zmožnost je odvisna od zdravja in varnosti na delovnem mestu, promocije in preventivnih dejavnosti na delovnem mestu.

*Corresponding author: Tel. + 387 35 254 606; E-mail: pranjicnurka@hotmail.com

1 INTRODUCTION

The workforce is ageing and the contribution of older workers is considerable. Their occupational health profiles differ from those of their younger (1) colleagues. Demographic changes imply an increasing number of workers with health problems and a decreasing of ability to work (2). Functional capacities, mainly physical, show a declining trend after the age of 30 years, and the trend can become critical after the next 15-20 years if the physical demands of work do not decline (3-5). Consequently, efforts to maintain the ability to work of currently and future employees are of key importance. In this context, the Finnish Institute of Occupational Health (FIOH) developed a generic tool during the 1980s to monitor and assess work ability, the so-called "Work Ability Index" (WAI) in the working population on a regular basis (6). WAI considers the workers' self assessed work ability in relation to work demands, health status and particular type of work. The WAI has since then been widely disseminated and is nowadays the most commonly used tool for measuring work ability (7). Excellent ability to work is closely related to the possibility to increase quality of work, improve quality of life and well-being among employees, thereby decreasing the likelihood of their early retirement, decreasing absenteeism, as well increasing motivation and productiveness in employees of all ages (8).

The most studied demographic factor regarding WAI was age, and some authors reported a decreased WAI with ageing (9-11). In the Finnish Health 2000 survey, nearly half of young adults perceived their work ability as excellent compared to 8% of 55-64 year-olds (12). Work ability decreases with age even among the healthy (13). Work ability significantly decreased with age among the women. Also, the ageing trend of WAI is different, depending on the sector of the economy. Work ability seems to be lower in farming and agriculture, the wood industry, the metal industry and transport, as well as in social services and in some countries among teachers (public sector) (14). The present study therefore aims at examining perception of work ability and its dimensions of public service employees aged 55 and older and gender differences in three cohorts in three European countries.

2 METHODS

2.1 Study Population and Design

A longitudinal study was performed between January and September 2018 among public service professionals in Spain, Monte Negro and Bosnia and Herzegovina (B&H). We assessed the influence of ageing and gender to work ability among public sector employees (in three various European countries: Spain (country in Europe Union),

Monte Negro and B&H (countries in South East Europe region). We compared national and gender differences of work ability in older employees aged ≥ 55 years in relation to young employees in between the ages of 19 to 54.

The study sample covered 1653 out of 2500 respondents who were invited and randomly selected aged between 18 and 72 years (797, 48% from Spain; 266, 16% from Monte Negro; and 590, 36% from Bosnia and Herzegovina), and the response rate was 66.12%. The women comprised 1091 (66%) of the study population, much more than men, 592. The mean age of the employees was 45.06 ± 10.90 (SD) and the mean length of service 20.74 ± 11.12 (SD) years. The study participants were staff members of primary health care wards, children and youth schools and other administrative services in these health care institutions and schools from Seville capitol of Andalusia in Spain, Podgorica, capitol of Monte Negro and Tuzla Canton, the most populous canton in B&H (52% teachers, 34% health care providers and 14% administrative officers) (Table 1).

2.2 Measuring Study Instruments

The survey study was conducted by WAI, which was used in the previous research and, on such occasions, adapted and translated into Spanish and South Slavic languages (Bosnian and Montenegrin) [14-17]. WAI measures seven aspects: current Work Ability (WA) compared with lifetime best; WA in relation to the physical and mental demands; current number of common chronic diseases; sick leave taken in the past 12 months; the worker's own prognosis of his or her work ability in two years' time; the worker's mental resources to accomplish his or her job. WAI is derived as the sum of the ratings on these seven items. The range of the summative index is 7-49 and the WAI categories are: poor, 7-27; moderate, 28-36; good, 37-43; and excellent 44-49. The internal consistency of each 7 items of the WAI questionnaire in our study sample was excellent (Cronbach, $\alpha=0.82$).

2.3 Statistical Analysis

We performed a data analysis using IBM SPSS Statistics for Windows, Version 19.0. We used descriptive, co-relational and explanatory linear regression methods (to provide predictive or protective potential between excellent WAI among 446 and poor WAI among 195 examiners as dependent variables; gender, country, age and each WAI scale as independent variables). To estimate differences and associations between WAI score categories in younger and older employees (≥ 55), we use a variable that contains the age dichotomized to 18-54 (mark 1) and equal to or more than 55 years (mark 2). All p-values <0.05 were regarded as statistically significant.

3 RESULTS

Between individual characteristics of respondents the mean by standard deviation (SD) were for: age 45.06 ± 10.90 years; length of service 20.74 ± 11.12 years; sick leave 5.72 ± 23.71 days; and WAI score 40.08 ± 6.17 (Table 1).

Table 1. Numerical screening data of a sample (n=1653).

Characteristics of subjects	Mean \pm SD	Minimum	Maximum
Age (years)	45.06 ± 10.90	1.00	72.00
Length of service (years)	20.74 ± 11.12	0.00	51.00
Sick- leave (days)	5.72 ± 23.71	0.00	334.00
WAI score	40.08 ± 6.17	1.00	49.00

Legend: SD- standard deviation

Table 2. Characteristics of a sample per gender (n=1653).

Characteristics of subjects		No (%)		P-value
		Man 562 (34)	Women 1091 (66)	
Country	B&H, 590 (36)	174 (31.0)	416 (38.1)	21.275
	Monte Negro, 266 (16)	73 (13.0)	193 (17.7)	0.001
	Spain, 797 (48)	315 (56.0)	482 (44.2)	
Age-groups (years)	18-34, 330 (20)	105 (18.7)	225 (20.6)	96.706
	35-44, 416 (25)	126 (22.4)	290 (26.6)	0.001
	45-54, 537 (33)	172 (30.6)	365 (33.5)	
	55-64, 336 (20)	136 (24.2)	200 (18.3)	
	65 or more than 65, 34 (2)	23 (4.1)	11 (1.0)	
Occupations in public sector	Health care providers, 563 (34)	106 (18.9)	457 (41.9)	27.911
	Children and youth teachers, 865 (52)	381 (67.8)	484 (44.4)	0.001
	Others administrative officers, 225 (14)	75 (13.3)	150 (13.7)	
Marital status	married, 1109 (67)	387 (68.9)	722 (66.2)	11.432
	single	131 (23.3)	232 (21.3)	0.043
	divorced	30 (5.3)	95 (8.7)	
	widowed	25 (4.4)	42 (3.8)	
Educational level	low, 60 (3)	24 (4.3)	36 (3.3)	20.649
	medium, 724 (44)	230 (40.9)	494 (45.3)	0.001
	high, 869 (53)	308 (54.8)	561 (51.4)	
Work ability determinates				
Work ability score groups	poor, 195 (12)	53 (9.4)	142 (13.0)	18.442
	moderate, 399 (24)	112 (19.9)	287 (26.3)	0.000
	good, 613 (37)	218 (38.8)	395 (36.2)	
	excellent, 446 (27)	179 (31.9)	267 (24.5)	
Current work ability compared with lifetime best	from minimal 1	3 (0.5)	9 (0.9)	22.173
	2	0 (0.0)	1 (0.1)	0.014
	3	2 (0.4)	12 (1.1)	
	4	6 (1.1)	15 (1.4)	
	5	27 (4.8)	36 (3.3)	
	6	18 (3.2)	58 (5.3)	
	7	83 (14.7)	122 (11.2)	
	8	163 (29.0)	265 (24.3)	
	9	117 (20.8)	272 (24.9)	
	to maximal 10	143 (25.5)	301 (27.5)	
Work ability in relation to mental demands	very poor	39 (6.9)	109 (9.9)	8.367
	rather poor	75 (13.4)	144 (13.0)	0.079
	moderate	92 (16.4)	220 (20.1)	
	rather good	212 (37.7)	389 (35.5)	
	very good	144 (25.6)	236 (21.5)	

Characteristics of subjects		No (%)		P-value
		Man 562 (34)	Women 1091 (66)	
Number of diagnosed diseases	0	298 (52.9)	606 (55.6)	6.124
	1	99 (17.6)	151 (13.8)	0.294
	2	60 (10.7)	103 (9.5)	
	3	38 (6.8)	77 (7.0)	
	4	24 (4.2)	43 (3.9)	
	5	43 (7.7)	111 (10.2)	
Estimated impairment of health influence to work	In my opinion, I am entirely unable to work	76 (13.5)	162 (14.9)	18.937
	I feel I am able to do only part- time work	40 (7.1)	85 (7.8)	0.004
	I must often slow down my work pace or change	33 (5.9)	86 (7.9)	
	I must sometimes slow down my work pace or change my work methods	39 (6.9)	98 (8.9)	
	I am able to do my job, but it causes some symptoms	93 (16.6)	228 (20.9)	4.432
	There is no hindrance/ I have no disease	281 (50.0)	432 (39.6)	0.489
Sick leave during the past year	100-365 days	15 (2.7)	26 (2.4)	
	25-99 days	13 (2.3)	43 (3.9)	
	10-24 days	30 (5.4)	69 (6.3)	
	≤ 9 days	133 (23.6)	256 (23.5)	
	0 days	371 (66.0)	697 (63.9)	
Own forecast of work ability for the next two years	unlikely	12 (2.1)	31 (2.8)	31.560
	not certain	65 (11.6)	247 (22.6)	0.001
	relative certain	485 (86.3)	813 (74.5)	
Enjoy your regular daily activities (mental resource)	often	198 (35.0)	362 (34.0)	11.401
	rather often	204 (36.0)	362 (34.0)	0.044
	sometimes	123 (22.0)	253 (22.0)	
	rather seldom	35 (6.0)	113 (10.0)	
	never	2 (1.0)	1 (0.0)	

Legend: P-value, Pearson Chi-Square

The study sample consisted of more women 1091 (66%) than men 562. The total number of respondents aged between 18 and 54 was 1287 (78%) and between them older employees aged ≥ 55 were 366 (22%). The poor WAI in women being 17% compared to 9.4% in men or excellent WAI found in women 24.5% vs. 31.9% in men ($P=0.001$). Women were much more affected by health disorders that influence their work than men ($P=0.004$). Women expressed much more (almost two times more) poor WA prognosis for the next two years than men, 22.6% vs. 11.6% ($P=0.001$). Women rarely enjoy their regular daily activities, other than men, who admit that they enjoy their daily activities ($P=0.044$) (Table 2).

Table 3. Work ability determinates compared by ageing (n=1653).

Work ability determinates		Age groups (years)		P-value*
		≤54 1287	≥55 366	
Work ability score groups	poor, 195 (12)	178 (13.8)	17 (4.6)	32.552 0.001
	moderate, 399 (24)	321 (24.9)	78 (21.3)	
	good, 613 (37)	444 (34.6)	169 (46.2)	
	excellent, 446 (27)	344 (26.7)	102 (27.9)	
Current work ability compared with lifetime best	from minimal 1	8 (0.6)	4 (1.1)	27.575 0.002
	2	1 (0.1)	0 (0.0)	
	3	13 (1.0)	1 (0.3)	
	4	20 (1.6)	1 (0.3)	
	5	51 (3.9)	12 (3.3)	
	6	59 (4.7)	17 (4.6)	
	7	152 (11.8)	53 (14.5)	
	8	312 (24.3)	116 (31.7)	
	9	296 (22.9)	93 (25.4)	
	to maximal 10	375 (29.1)	69 (18.8)	
Work ability in relation to mental demands	very poor	121 (9.5)	20 (5.5)	8.571 0.073
	rather poor	177 (13.7)	42 (11.5)	
	moderate	243 (18.9)	69 (18.8)	
	rather good	453 (35.2)	148 (40.4)	
	very good	293 (22.7)	87 (23.8)	
Number of diagnosed diseases	5	102 (7.9)	52 (14.2)	29.895 0.001
	4	48 (3.7)	19 (5.2)	
	3	80 (6.2)	35 (9.5)	
	2	125 (9.7)	38 (10.4)	
	1	186 (14.5)	64 (17.5)	
	0	746 (58.0)	158 (43.2)	
Estimated impairment of health influence to work	In my opinion, I am entirely unable to work	215 (16.7)	23 (6.3)	39.108 0.001
	I feel I am able to do only part- time work	102 (7.9)	23 (6.3)	
	I must often slow down my work pace or change	102 (7.9)	17 (4.6)	
	I must sometimes slow down my work pace or change my work methods	107 (8.3)	30 (8.2)	
	I am able to do my job, but it causes some symptoms	241 (18.7)	80 (21.9)	
	There is no hindrance/I have no disease	520 (40.5)	193 (52.7)	

Legend: P-value, Pearson Chi-Square

Respondents aged ≥55 years significantly frequent attained excellent WAI and in particular good WAI compared to younger (P=0.001). Older employees more frequent perceived higher current work ability compared with lifetime best than younger respondents (P=0.002).

They had a much higher number of diagnosed illnesses (from 1 to 5) than younger employees (P=0.001), but older employees were significantly more influenced by diseases to work and work inability due to disease (Table 3).

Table 4. Correlation between WAI dimensions' and gender; and correlation between WAI dimensions' and aging in all respondents (n=1653).

Spearman correlation between <i>gender</i> and WAI	Correlation factor	Spearman correlation between <i>aging</i> and WAI	Correlation factor
Current work ability compared with lifetime best	0.036 (>0.05)	Current work ability compared with lifetime best	-0.115 (<0.001)
Mental demands of work	-0.059 (<0.05)	Mental demands to work	0.084 (<0.001)
Health impairment influence to work	-0.080 (<0.001)	Health disorders influence to work	0.177 (<0.001)
Sick leave during one year	-0.025 (>0.05)	Sick leave during one year	0.043 (>0.05)
WA prognosis for two years	-0.134 (<0.001)	WA prognosis for two years	-0.006 (>0.05)
Enjoyment of daily tasks	-0.047 (>0.05)	Enjoyment of daily tasks	0.056 (<0.05)
Be physically and psychological active	0.003 (>0.05)	Be physically and psychological active	0.026 (>0.05)
Optimism about the future	0.000 (>0.05)	Optimism about the future	-0.046 (>0.05)
Decreased WAI score	-0.104 (<0.001)	Decreased WAI score	0.076 (<0.001)

There are significantly negative correlations between WAI dimensions' and gender ($P<0.001$): health disorders influence to work (correlation=-0.080); WA prognosis for two years (correlation=-0.134); and decreased WAI score (correlation=-0.104) more in women than men; and a significantly negative correlation between mental demands of and gender among women ($P<0.05$; correlation=-0.059). Increased ageing positive correlated with WA dimensions 'at the level of $P<0.001$: mental demands of work (correlation=0.084); health disorders influence to work (correlation=0.177); and decreased WAI score (correlation=0.076). We found a negative correlation between ageing and current work ability compared with lifetime best (correlation factor=-0.115).

Using a multilevel logistic regression model we found that the excellent work ability index was associated with the following predictors: to live in Spain or Europe Union ($\beta=-0.185$, 95%CI, -5.612- -2.576, $P<0.000$), higher level of education ($\beta=0.123$, 95%CI, 0.778-2.414, $P<0.001$), higher level of current work ability ($\beta=0.280$, 95%CI, -0.973-1.421, $P<0.000$), lower level of physical demands of work ($\beta=-0.084$, 95%CI, -0.023- -0.046, $P<0.003$), lower level of mental demands of work ($\beta=-0.048$, 95%CI, -1.085- -0.084, $P<0.022$), sick leave during the past year ($\beta=0.144$, 95%CI, 0.323-0.073, $P<0.001$), and prognosis of work ability in next two years ($\beta=0.305$, 95%CI, 0.566-0.866, $P<0.001$) among 446 (27%) respondents.

Predictors of poor WAI were: to live in southeast Europe countries ($\beta=0.334$, 95%CI, 0.659- 1.728, $P<0.000$), to be divorced or widowed ($\beta=-0.078$, 95%CI, -0.527- -0.043, $P<0.021$), low level of education ($\beta=-0.191$, 95%CI, -0.771- -0.201, $P<0.001$), high level of physical demands at work ($\beta=0.452$, 95%CI, 0.054-0.080, $P<0.001$), high level of mental demands at work ($\beta=0.194$, 95%CI, 0.561-1.151, $P<0.001$), high level of impairment due to disease ($\beta=0.452$, 95%CI, 0.054-0.080, $P<0.001$), bad prognosis of WA in next two years ($\beta=0.331$, 95%CI, 1.062-1.624, $P<0.001$), and decline of mental resources ($\beta=0.097$, 95%CI, 0.092-0.510, $P<0.005$) among 195 (12%) respondents (shown in Table 5).

Table 5. Results of the multiple linear regression analyses for respondents with excellent work ability ($n=446$) and for respondents with poor work ability index ($n=195$) as dependent variables; demographic factors and work environment factors obtained (independent variables).

Predictors of work ability	B	P-value	95% Confidence interval	
Excellent work ability index				
Sex	0.008	0.612	-0.587	0.995
Country	-0.185	0.000	-5.612	-2.576
Age	0.002	0.892	-0.370	0.425
Marital status	-0.019	0.252	-0.792	0.209
Educational level	0.123	0.000	0.778	2.414
Current WA compared with lifetime best	0.280	0.000	0.973	1.421
Physical demands of work	-0.084	0.003	-0.023	-0.046
Mental demands of work	-0.048	0.022	-1.085	-0.084
Health impairment influence to work	-0.062	0.002	-0.805	-0.186
Lower incidence of sick leave	0.052	0.019	0.091	0.988
Prognosis of WA in two next years' time	0.273	0.000	1.182	1.906
Mental resources	0.063	0.085	-0.112	1.711
Poor (bad) work ability index				
Sex	-0.022	0.472	-0.429	0.199
Country	0.334	0.000	0.659	1.728
Age	-0.030	0.413	-0.233	0.096
Marital status	-0.078	0.021	-0.527	-0.043
Educational level	-0.191	0.001	-0.771	-0.201
Current WA compared with lifetime best	0.338	0.000	0.701	1.048
Physical demands of work	0.452	0.001	0.054	0.080
Mental demands of work	0.194	0.000	0.561	1.151
Health impairment influence to work	0.452	0.000	0.054	0.080
Higher incidence of sick leave	0.058	0.085	0.029	0.448
Prognosis of WA in two next years' time	0.331	0.000	1.062	1.624
Decline of mental resources	0.097	0.005	0.092	0.510

Legend: B, Beta coefficient in regression ANOVA analysis of potential predictors

4 DISCUSSION

The present study adds important knowledge about 1653 (1091 female) employees in the public sector of which most were employed in health care or education field of service and coming from Spain, B&H and Monte Negro at the time of progressive population aging and when extended working life is a necessity and a possibility. This survey aims to answer the following question: are individual factors, physical or mental demands of work, and health determinants of excellent or poor WAI? Twenty seven percent of the entire population based cohort reported excellent WAI and 12% perceived poor WAI.

The relations observed between WAI and individual variables generally support those reported in the literature. The authors of numerous studies suggested a strong association between ageing and the decline in work ability and demonstrated that young workers estimate their WAI at a higher level than older ones (18-23). Ageing is related to decreasing physical work capacity (7, 8, 24). Work ability in relation to demands in working life results in increasing strain in older employees (18). Furthermore, ageing results in a higher prevalence of clinical diseases (25-28). Work ability among Croatian nurses confirmed that the WAI score decreases significantly with age (29-30). The relations observed between WAI and the individual variables generally support those reported in the literature. The authors of numerous studies suggested a strong association between ageing and a decline in work ability. They demonstrated that young workers estimate their WAI at a higher level than older ones. We found a significant correlation between aging and decreased WAI score, decreased current work ability among our participants too, but our older employees aged 55 and over 55 years had better levels (categories) of WAI than their younger colleagues.

According study results, ageing and gender did not influence work ability among our respondents (Table 5). Some prior studies also demonstrated no association between ageing and WAI (12, 31, 32), and one study found a higher risk for a poor WAI among younger workers (26). High physical workload among women working in social and health care is likely to contribute to the gender differences (31).

According to study results, ageing and gender did not influence work ability among our respondents. Predictors for poor work ability were: a high level of mental demands at work, a low level of education, health impairments during work, and bad self-prognosis for work. Our finding is in accordance with data that was reported by other authors (11-13, 22, 33, 34). On the basis of assessment of protectors for excellent WAI (excellent WAI) were: a high level of education, a low level of impairment influenced to work and reduced sick leave days.

5 CONCLUSION

Gender and ageing wasn't associated with low or high level of work ability among public sector employees. High mental and physical workload among women working in public sector occupations are likely to contribute to the work ability gender differences, but we didn't find it among our respondents. As workers age, their physical, physiological and psychosocial capabilities change. Keeping older workers healthy is a key goal of the labour policy. Providing educational and career prospects can contribute to maintaining work ability during all your working life.

CONFLICT OF INTEREST

The authors declare that there was no conflict of interest.

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ETHICAL APPROVAL

Research includes human data, which have been performed in accordance with Declaration of Helsinki and have been approved by the Ethics Committee of University of Tuzla, Ethics Committee of Universidad Pablo de Olavide and Ethics Committee of University of Monte Negro. Before interviews, the nature and the purpose of the study were explained and full confidentiality was assured to all participants. All participants were informed about their right not to participate in the study and gave their oral consent before the study.

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