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ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

The relationship of attitudes and behaviors with working conditions and physical activity among workers in public hospitals in Greece

OBJECTIVE To investigate (a) the structural validity of the Greek version of the Safety Attitudes Questionnaire (SAQ), and (b) the relationship between SAQ scores and attitudes and behaviors concerning physical activity, among health care workers in Greek public hospitals. **METHOD** Three questionnaires were used. The first questionnaire, SAQ, investigated factors related to patient safety. The second questionnaire examined attitudes towards physical activity, and the third questionnaire, the Leisure-Time Exercise Questionnaire, was used to estimate the weekly exercise of the participants. Questionnaires were completed by 508 health care workers, from 10 city and regional hospitals in the 3rd health prefecture of Macedonia (Northern Greece), and the 1st health prefecture of Attica (Athens). **RESULTS** The study results confirmed the structural validity of the Greek version of SAQ. Significant differences were demonstrated between the items on SAQ, according to (a) the specialty of the health care workers, where doctors had higher scores than nurses in “job satisfaction” and “teamwork climate”, (b) hospital category, where workers in regional hospitals had higher scores than those in city hospitals in “job satisfaction”, “safety climate” and “work conditions”, and (c) exercise, where pro-exercisers had higher scores than non-exercisers in “stress reduction” and “job satisfaction”. **CONCLUSIONS** The Greek version of SAQ is a reliable tool for assessing the safety climate, teamwork, work satisfaction, working conditions, stress recognition and management perceptions among health care workers in Greek hospitals. Investigation of the attitudes and behaviors of health professionals can make a significant contribution to the design and implementation of interventions to reduce workplace stress, and promote healthier lifestyles.

Despite increased interest in the quality of care provided by hospitals, mistakes and unwanted incidents continue to be frequent in the clinical daily routine. Mistakes include unsigned medical instructions and incomplete or illegible instructions. Knowledge and understanding of the source of mistakes is the beginning of implementation of a strategy to reduce them.¹

Studies² show that medical errors are not just the result of the indifference of the individual or the actions of a particular group. Commonly, mistakes are due to the systems in operation, to incorrect processes and to working conditions, that all contribute to causing people to make mistakes or fail to prevent them. For example, storing toxic medications in hospital clinics and not in hospital pharmacies has led to fatal errors.

The importance of physical activity in achieving and

maintaining mental and physical health has been recognized by several international organizations. Participation in physical activities has been shown to have a positive effect on mental health, as it helps to combat stress, depression and loneliness.³

Workplace stress is now globally recognized as one of the most serious health problems that international businesses are called upon to face. Statistics issued by the European Agency for Safety and Health at Work show that anxiety consistently occupied, for 5 years, the second place among work-related health problems, following musculoskeletal disorders. In the European Union, 28% of workers, nearly one in three, consider stress to be the most important problem in their workplace. This percentage represents 41 million European workers experiencing work-related stress each year.⁴

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2020, 37(4):457–463

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Σχέση στάσεων και συμπεριφορών σχετικά με τις συνθήκες εργασίας και τη σωματική δραστηριότητα μεταξύ των εργαζομένων σε δημόσια νοσοκομεία της Ελλάδας

Περίληψη στο τέλος του άρθρου

Key words

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Health promotion in the workplace aims at the adoption of strategies and methods of good practice in various aspects of work life, such as physical exercise, smoking, nutrition, drinking, stress management, and mental health in the workplace. At the same time, it aims at developing methods of managing health promotion measures in the workplace and the development of human resources culture and consciousness.⁵

In general, professional satisfaction has been linked to work motivation, attitudes and values, around which several theories have been developed. There appears to be a perception that professional satisfaction must be seen as an overall and unified attitude towards a particular field of work, consisting of individual elements. Researchers^{6,7} conducting studies on the application of a specific health education program found significant differences in occupational satisfaction, related to the educational level, subject of work, marital status, and regular exercise.

It is also well understood that in order for staff members to work effectively, they must employ special knowledge, skills, attitudes and effective communication, and display a positive mood during teamwork.⁸⁻¹⁰ Investigations conducted in the workplace, including health facilities, have provided evidence of how work conditions are related to patient safety. A survey on the working conditions and their impact on nursing staff, conducted in the region of Central Macedonia, Greece, revealed the unfavorable conditions of practice of the nursing profession and its negative impact on both staff and patients. The negative perceptions of respondents regarding the assessment of the building and logistics infrastructure reflect the current low-grade situation. Despite the improvements in the pre-existing hospitals and the erection of new hospitals that were carried out in the context of the development of the Greek National Health Service (NHS), poor architectural structure, old buildings, poorly equipped and badly maintained, with inadequate workplaces and unhygienic patient wards constitute the daily working environment of much of the nursing staff of the country.¹¹

The present study was conducted, therefore, in an attempt to investigate: (a) the structural validity of the Greek version of SAQ, and (b) possible relationships between attitudes and behaviors, working conditions and physical activity, among workers in health care services in Greek public hospitals. It should be noted that no similar research has ever been conducted in Greece.

MATERIAL AND METHOD

The study was conducted in 2018–2019, using self-completed questionnaires.

Sample

The study sample consisted of 508 employees in 10 hospitals of the 3rd Health District of Macedonia (Northern Greece) and the 1st Health District of Attica (Athens). All health care workers in the hospitals (doctors, nurses, midwives, support staff, physiotherapists, dietitians, etc.) were invited to fill in the questionnaires, regardless of their employment status within the organization. The distribution of the questionnaires started after receiving written approval from the aforementioned Health Districts. The questionnaires were distributed to the various hospital departments after briefing of the directors and managers on the content and purpose. Confidentiality was assured and participation was voluntary.

Questionnaires

For the completion of the survey, the study participants were asked to indicate their age, sex, specialty (i.e., doctors, nurses, etc.) and hospital category (city-regional), and three questionnaires were administered:

- The Safety Attitudes Questionnaire (SAQ). This instrument is an improved version of the “Intensive Care Unit Management Questionnaire” (ICUMAQ),^{12,13} which was derived from the “Flight Management Attitudes Questionnaire” (FMAQ).¹⁴ It includes 38 questions that examine the following factors: teamwork (9 questions), stress recognition (4 questions), perception of management (5 questions), safety climate (8 questions), job satisfaction (5 questions), and working conditions (7 questions). The answers are given on a 5-point Likert type scale, from 1 (I strongly disagree), to 5 (I strongly agree). The Greek version of SAQ was used.
- The Attitudes towards Exercise questionnaire. This questionnaire is based on the Theory of Planned Behavior¹⁵ and has been used in other relevant surveys in Greek population.^{16,17} It consists of one question “For me to exercise is...”. Responses are given on a 7-point Likert type scale, using six different bipolar adjectives as answers (i.e., good-bad, foolish-smart, healthy-unhealthy, useful-non-useful, nice-ugly, pleasant-unpleasant). Answers range from 1 for the negative adjective, through neutral, and up to 7 for the positive adjective.
- The Leisure-Time Exercise Questionnaire. This was used to calculate the exercise behavior on a weekly basis.¹⁸ The participants answer the question: “On examining a period of 7 days (last week), how many times have you been involved in the following activities for more than 15 min in your spare time?”. The possible response categories are as follows: (a) Excessive exercise: (The heart beats quickly) – i.e., jogging, long-distance jogging, soccer, basketball, intense swimming, intense long-distance cycling, weight training, (b) moderate exercise: (Not exhausting) – i.e., fast walking, tennis, relaxed cycling, volleyball, relaxed swimming, folk and traditional dancing, and (c) mild exercise: (Minimum effort) – i.e., yoga, fishing, bowling, golf, relaxed walking. The participants filled in the number that represented how many times they had

performed one or more of these activities. The Total Exercise Index or total energy cost was calculated by the sum of the number of activities performed per category, multiplied by the corresponding averages of the energy cost per category: [(intense intensity $\times 9$) + (medium volume $\times 5$) + (low volume $\times 3$)]. The validity and credibility of the instrument, has been supported in relevant studies,^{18,19} and has been adapted and used in Greece.²⁰

Statistical analyses

The Statistical Package for Social Sciences (SPSS), version 18.0 software (SPSS Inc, Chicago, IL) was used for data analysis. Specifically, Cronbach's alpha was used to test the reliability of the questionnaires. Exploratory factor analysis was used to test the structural validity of the SAQ. Multivariate analysis of variance was used to test for differences between hospitals and staff groups, in attitudes and behaviors, working conditions and physical activity. Correlation analysis, using the post-hoc multiple comparisons Scheffe test, was performed to reveal possible relationships among the variables of the various questionnaires.

RESULTS

Of the 508 questionnaires included in the study, 112 (22%) were completed by doctors, 310 (61%) by nurses, 37 (9.7%) by support staff, 35 (6.9%) by technologists, and 14 (2.8%) by pharmacy staff, of which, 135 (26.6%) were men and 373 (73.4%) women. Concerning age, 61 participants (12%) were aged 20–30 years, 236 participants (46.5%) 30–40 years, 174 participants (34.3%) 40–50 years, and 35 participants (6.9%) were aged 50+ years.

The structural validity of the SAQ was examined with use of the exploratory factor analysis. The extraction of factors was done by principal component analysis and rotation of the axes by revolving rotation (varimax rotation). Seven factors had eigenvalues of greater than 1.1. with queries of factors for questions with values above 0.40. The questionnaire met the factorization criteria (KMO=0.880, Bartlett's test of sphericity, $p < 0.001$). Further analysis included only the questions that were over 0.40 (tab. 1).

The internal consistency²¹ for the variables of all the questionnaires ranged from 0.71 to 0.86 (tab. 2). Correlation coefficient analysis was conducted among all the variables of the questionnaires (tab. 2).

Univariate analysis conducted to detect specialty (i.e. doctors, nurses, etc.) (independent variable) differences revealed the following statistically significant differences: (a) For the dependent variable: [$F_{(1,420)}=4.92$, $p < 0.05$], and (b) for the dependent variable "teamwork climate": [$F_{(1,420)}=7.08$, $p < 0.05$]. For both "job satisfaction" and "teamwork climate",

the post-hoc multiple comparisons Scheffe test indicated that doctors had a higher score than nurses (tab. 3).

Univariate analysis conducted to investigate hospital category (city-regional) (independent variable) differences. The analyses revealed the following statistically significant differences: (a) For the dependent variable "job satisfaction": [$F_{(1,506)}=25.25$, $p < 0.05$]; the Scheffe test indicated that the regional had a higher score than the city hospitals. (b) For the dependent variable "safety climate": [$F_{(1,506)}=7.17$, $p < 0.05$]; the Scheffe test indicated that the regional had a higher score than the civil. (c) For the dependent variable "working conditions": [$F_{(1,506)}=9.03$, $p < 0.05$]; the Scheffe test indicated that the regional had a higher score than the city hospital. (d) For the dependent variable "stress recognition": [$F_{(1,506)}=5.07$, $p < 0.05$]; the Scheffe test indicated that the city had a higher score than regional (tab. 3).

Finally, univariate analysis was conducted to find any differences in SAQ scores according to physical activity (pro- and non-exercisers) (independent variable). The following statistically significant differences were revealed: (a) For the dependent variable of "stress recognition": [$F_{(1,412)}=3.1$, $p < 0.05$]; the Scheffe test indicated that non-exercisers had a higher score than the pro-exercisers group, and (b) for the dependent variable "job satisfaction": [$F_{(1,412)}=3.91$, $p < 0.05$]; the Scheffe test indicated that the pro-exercisers had a higher score than non-exercisers group (tab. 3).

DISCUSSION

The purpose of this study was to investigate the structural validity of the Greek version of SAQ and to explore relationships between attitudes and behaviors as well as working conditions and physical activity among workers in health care services in Greek public hospitals. To our knowledge, no similar study has been conducted in Greece. The discussion and conclusions therefore reflect a first attempt to interpret the results.

Factor analysis of data showed that the Greek version of SAQ is valid and reliable, and the analysis confirmed the existence of six factors, as reported by previous researchers.^{13,14} The satisfactory internal consistency of the questionnaire factors confirmed the reliability of the scale and supports its use in the Greek professional context.

With regard to the second research aim, differentiation was identified among the major professional specialties of hospital workers. Specifically, doctors reported being more satisfied with the working conditions than nurses, and characterized themselves as greater "team-players". Previous studies documented similar results,¹⁴ demonstrating male

Table 1. Structural validity of the Safety Attitudes Questionnaire (SAQ): Question loadings from a study of health care workers in Greek hospitals (n=508).

Questions	Factors					
	1	2	3	4	5	6
<i>Hospital administration</i>						
Supports my daily efforts	0.738					
Does not compromise the safety of patients	0.571					
Does a good job	0.776					
Staff problems are constructively dealt with	0.763					
I'm provided with adequate, timely info about events in the hospital that might affect my work	0.793					
<i>Job satisfaction</i>						
I like my job		0.568				
Working in this hospital is like being a part of a large family		0.655				
This hospital is a good place to work		0.754				
I'm proud to work in this hospital		0.778				
Moral in this hospital is high		0.663				
<i>Teamwork climate</i>						
The contribution of nurses is well recognized			0.436			
Disagreements are resolved appropriately (i.e., not who is right, but what is best for the patient)			0.505			
I have the support I need from other personnel to care for patients			0.640			
It's easy for personnel to ask questions when there is something that they don't understand			0.750			
The physicians and nurses here work together as a well-coordinated team			0.459			
I would feel safe to be treated here as a patient			0.431			
<i>Working conditions</i>						
Does a good job on training new personnel				0.678		
All the necessary info for diagnostic and therapeutic decisions are available to me constantly				0.644		
Trainees in my field/area are being adequately supervised				0.644		
People deal effectively with stressful events at work				0.633		
People work together as a well-coordinated team				0.491		
<i>Stress recognition</i>						
When my workload becomes excessive, my performance is impaired					0.815	
I'm less effective at work when I'm fatigued					0.856	
I'm more prone to mistakes in tense or hostile situations					0.718	
Fatigue impairs my performance during emergency situations (i.e., emergency resuscitation, seizure, etc.)					0.686	
<i>Safety climate</i>						
Medical errors are handled appropriately						0.427
I know the proper procedures to direct questions regarding patient safety						0.491
I'm encouraged by my colleagues to report any patient safety concerns I might have						0.588
The attitude in this hospital makes it easy for you to learn from errors of others						0.604
My security proposals would be adopted if I would express them in the administration						0.463

Table 2. Correlations among variables from hospital staff responses to three questionnaires[†] (n=508).

Variables	M	S.D.	Cronbach α	1	2	3	4	5	6	7	8	9	10	11
1. Job Satisfaction	3.88	1.04	.81		.368**	.354**	.601**	.513**	-.094*	.515**	<i>n.s.</i>	.252*	<i>n.s.</i>	<i>n.s.</i>
2. Clinic Administration	3.48	1.22	.83			.564**	.430**	.362**	<i>n.s.</i>	.390**	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>
3. Hospital Administration	2.98	1.36	.86				.420**	.385**	<i>n.s.</i>	.318**	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>
4. Safety Climate	3.71	.976	.71					.596**	<i>n.s.</i>	.673**	<i>n.s.</i>	-.257*	<i>n.s.</i>	<i>n.s.</i>
5. Working Conditions	3.31	1.08	.75						<i>n.s.</i>	.515**	<i>n.s.</i>	-.344*	<i>n.s.</i>	<i>n.s.</i>
6. Stress Recognition	3.73	1.21	.77							<i>n.s.</i>	-.331**	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>
7. Teamwork Climate	3.77	.983	.77								<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>
8. Exercise Attitudes	1.99	.865	.82									.682**	.528**	.645**
9. Excessive Exercise	2.04	1.23											<i>n.s.</i>	<i>n.s.</i>
10. Moderate Exercise	2.48	1.38												.272*
11. Mild Exercise	3.97	2.15												

**p<0.01, *p<0.05

M: Mean, SD: Standard deviation

[†]Safety Attitudes Questionnaire (SAQ): 1–7, Attitudes towards Exercise questionnaire: 8, Leisure-time Exercise questionnaire: 9–11

doctors as more positive thinking and problem-solving individuals.²² Another Greek study²³ pointed out that female doctors score higher on aspects such as values and “team culture”. In the same study, several differences appeared among the attitudes of nurses towards teamwork. The stereotype of nursing as a female occupation was found

to affect job satisfaction and the decision-making process in male nurses, creating an overall barrier to effective collaboration.

Differences were demonstrated in work satisfaction, safety, working conditions and stress recognition, between the city and the regional hospitals, all being scored higher in staff working in the city hospitals. It has also been reported²⁴ that the numbers of incidents received and treated by each hospital and the numerical adequacy of the staff, are factors that differentiate the working conditions among the staff in different hospitals. The main factor differentiating the kinds of hospitals is mainly the number of incidents. Public hospitals receive greater numbers of patients daily, as a result of which, workers in these hospitals report increased levels of stress and anxiety,²⁵ and lower levels of overall satisfaction in areas such as working conditions and safety.²⁶

Concerning exercise attitudes and habits, higher (i.e., more positive) scores for stress reduction and job satisfaction were recorded by staff who are pro-exercisers than staff who are non-exercisers. In accordance with these findings, other researchers^{27,28} noted significant differences in work satisfaction among workers in relation to their participation in regular physical activity/exercise. Exercise has been associated, not only with overall work satisfaction, but also with reduction in work-related stress.^{29,30} In this study correlation was demonstrated between exercise attitudes and stress recognition, according to whether the hospital workers were pro-exercisers or non-exercisers (tab. 2).

A study conducted by the University of Bristol investigated the effect of having workstations in workplaces,

Table 3. Safety Attitudes Questionnaire scores of hospital workers according to specialty, hospital category and exercise habits (Univariate ANOVA analysis).

Variables	Specialty			
	Doctors		Nurses	
	M	SD	M	SD
Job satisfaction	4.01	0.79	3.75	1.08
Teamwork climate	3.94	1.32	3.66	1.08
Variables	Hospital category			
	Regional		City	
	M	SD	M	SD
Job satisfaction	4.04	0.89	3.56	0.96
Safety climate	3.80	0.64	3.55	0.96
Working conditions	3.41	0.55	3.11	1.02
Stress recognition	3.64	0.71	3.89	0.67
Variables	Exercise			
	Pro		Non	
	M	SD	M	SD
Stress reduction	4.4	0.89	3.9	0.96
Job satisfaction	5.2	1.29	2.7	0.60

M: Mean, SD: Standard deviation

and whether employees who are able to exercise in their workplace are more productive, happy, efficient and quiet. The results showed that that exercise revitalized the staff, improved their concentration and problem solving, and made them feel more relaxed. Another study showed that an energetic break has beneficial effects, not only on physical condition, but also on performance. The researchers argued that the findings should encourage employers to provide exercise facilities for their employees.³¹ Participation in aerobic exercise programs has also been shown to contribute to the reduction of work-related stress.³²

In the present study, the Greek version of SAQ was confirmed as a reliable tool for measuring and assessing the safety climate, teamwork, work satisfaction, working conditions, stress recognition, and management perceptions in Greece. In addition, assessment of attitudes and

behaviors of health professionals in areas related to work conditions and exercise can make a significant contribution to designing and implementing interventions to reduce stress levels and medical errors, and to increasing professional-life satisfaction. These results can be the platform for developing initiatives to design strategies providing resources and tools to improve the work environment of health care workers in hospitals.

Understanding the factors that contribute to errors at each level of health care is essential, but research should not be limited to studying clinical practice errors. Changing medical culture is difficult to achieve, but a government policy that emphasizes quality and accountability can be the mechanism that will cultivate a culture of reducing errors and increasing staff enjoyment. Cooperation and vigilance are needed by all those involved in health care services.

ΠΕΡΙΛΗΨΗ

Σχέση στάσεων και συμπεριφορών σχετικά με τις συνθήκες εργασίας και τη σωματική δραστηριότητα μεταξύ των εργαζομένων σε δημόσια νοσοκομεία της Ελλάδας

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ΣΚΟΠΟΣ Η διερεύνηση (α) της εγκυρότητας του ερωτηματολογίου (Safety Attitudes Questionnaire, “SAQ”) και (β) πιθανών σχέσεων μεταξύ των στάσεων και των συμπεριφορών των εργαζομένων όσον αφορά στις συνθήκες εργασίας τους και στη σωματική άσκηση, σε ελληνικά δημόσια νοσοκομεία. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Χρησιμοποιήθηκαν 3 ερωτηματολόγια. Το πρώτο ερωτηματολόγιο “SAQ” διερεύνησε τους παράγοντες που σχετίζονται με την ασφάλεια των ασθενών. Το δεύτερο ερωτηματολόγιο εξέτασε τις στάσεις και τη συμπεριφορά των εργαζομένων σε σχέση με τη σωματική δραστηριότητα και το τρίτο ερωτηματολόγιο (άσκηση κατά τον ελεύθερο χρόνο) χρησιμοποιήθηκε για την εκτίμηση των ασκητικών συμπεριφορών των εργαζομένων, ανά εβδομάδα. Συνολικά, συλλέχθηκαν 508 ερωτηματολόγια από 10 νοσοκομεία της 3ης Υγειονομικής Περιφέρειας Μακεδονίας και της 1ης Υγειονομικής Περιφέρειας Αττικής. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Τα αποτελέσματα εμφάνισαν στατιστικά σημαντικές διαφορές μεταξύ των παραγόντων του SAQ και: (α) της ειδικότητας των εργαζομένων, όπου οι ιατροί είχαν υψηλότερους δείκτες όσον αφορά στην «επαγγελματική ικανοποίηση» και στο «κλίμα ομαδικότητας» απ’ ό,τι οι νοσηλευτές, (β) της κατηγορίας των νοσοκομείων, όπου τα περιφερειακά είχαν υψηλότερους δείκτες όσον αφορά στην «επαγγελματική ικανοποίηση», στο «κλίμα ασφάλειας» και στις «συνθήκες εργασίας» απ’ ό,τι τα αστικά και τέλος (γ) ασκούμενους και μη ασκούμενους, όπου οι ασκούμενοι είχαν υψηλότερους δείκτες στη «μείωση του stress», όπως και στην «επαγγελματική ικανοποίηση», σε σχέση με τους μη ασκούμενους. **ΣΥΜΠΕΡΑΣΜΑΤΑ** Τα αποτελέσματα της μελέτης κατέδειξαν ότι το SAQ είναι ένα αξιόπιστο εργαλείο μέτρησης και αξιολόγησης του κλίματος ασφάλειας, της ομαδικής εργασίας, της ικανοποίησης από την εργασία, των συνθηκών εργασίας, της αναγνώρισης του άγχους και των αντιλήψεων της διοίκησης. Η αξιολόγηση των στάσεων και των συμπεριφορών των επαγγελματιών του τομέα της υγείας σε τομείς ενδέχεται να συμβάλει σημαντικά στον σχεδιασμό και στην εφαρμογή παρεμβάσεων για τη μείωση του εργασιακού stress και στην αύξηση ενός υγιεινότερου τρόπου ζωής.

Λέξεις ευρητηρίου: Ειδικότητα, Ερωτηματολόγιο “SAQ”, Stress εντός εργασιακού χώρου, Σωματική δραστηριότητα

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