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The Effect of Physical Activity on Burnout Syndrome in Emergency Room Nurses Working in Public Hospitals

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Abstract

The concept of burnout, and indeed its increasing prevalence in recent years, has been a matter of major concern among psycologists, sociologists and HR specialists. This research aims to explore the impact of physical activity on burnout syndrome experienced by emergency room nurses in public hospitals. The preliminary research sample consisted of 476 emergency room nurses working in the 3rd, 4th and 5th Health Regions of Greece. The participants' age ranged from 22 to 60years (age 42.49±9.5 years). The participants completed questionnaires that assessed burnout and physical activity. The Maslach Burnout Inventory was utilised, which comprises 22 symptom items and measures three dimensions: emotional exhaustion, personal accomplishment and depersonalisation. In addition, and for measuring physical activity, the International Physical Activity Questionnaire (IPAQ, short version) (recall period one week) (Craig, et. al., 2003) was used. The said questionnaire consists of 7 questions collecting information on the time spent each day in vigorous, moderate and walking physical activities as well as the time spent sitting over a period of seven days. The measurement method used was the Likert scale. The results showed that nurses experienced a high level of burnout, whilst the majority of them demonstrated a low level of physical activity and that physical activity is directly correlated to burnout, as is positively effects all three factors. It is therefore concluded that physical activity seems to have a positive effect on the emotional balance of the worker helping him/her deal with the symptoms of burnout.

Keywords: *burnout, physical activity, nurses*

Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure above the basal metabolic rate. Sport is defined as a strictly structured physical activity, under rigorous rules, high levels of competition and specialisation, whose basic aim is to maximise athletic performance (Caspersen, Powell & Christensen, 1985). On the other hand, exercise is defined as each systematic bodily movement or participation in physical activities, that is time-limited, less competitive and where, mostly, the body's major muscle groups are involved (Berger, Pargman, & Weinberg, 2007).

The perception that physical activity delivers overall benefits is acknowledged worldwide (Török et al., 2006). That's what at least is implied given compulsory gym classes at schools, the great number of sports clubs and the high engagement of middle-aged and older people in fitness and sports, along with the immense growth of the sports equipment/sportswear industry. Also, participation in physical activities accounts for a decrease of death rates by 20-40% regardless of underlying causes (Khan et al., 2012). However, today, as people commute to work mostly by car or public transport, consume large quantities of food, and are obliged to live in densely populated urban areas lacking in green spaces, their body weight increases and their physical fitness levels decrease, leading to diseases associated with this lifestyle (Popkin et al., 2012).

Furthermore, the annual economic burden of physical in-

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activity in European countries is about 80 billion dollars for the four major non-infectious diseases (cardiovascular diseases, type II diabetes and breast and colon cancer). This amount accounts for 6.2% of all health care costs in Europe, and is five billion dollars higher than the amount spent worldwide for the treatment of cancer, an amount equivalent to 50% of Ireland's and Portugal's Gross Nation Product (GNP), while it is estimated, that by 2022 this amount will have reached 125 billion dollars (Allemani et al., 2015).

Exercise therefore, does not only help maintain a healthy body contributing to its well-being, but also cures the body and improves mental health, two components that invariably go hand in hand. In other words, the message that exercise conveys, is not directed solely to healthy but also to ailing individuals, with a view to prevent diseases and improve morbidity rates (Theodorakis, 2005).

Burnout, as a psychology term, was coined by Bradley (1969), to describe a phenomenon met in professions that provide services. However, it was Freundenberger (1974), who first highlighted the symptoms of burnout syndrome. To describe this phenomenon he chose the word burnout and described exhaustion as a state of fatigue or disappointment that arises by committing to a cause, a lifestyle, or by failing to obtain an expected reward. However the prevailing definition is that of Maslach & Jackson (1986), who described burnout as being a psychological syndrome caused by chronic stress experienced by professionals working in the area of services. More specifically, what is decribed here is a chronic strain arising from a fundamental disconnect or mismatch between the worker and the workspace (Leiter & Maslach, 2003).

What has been observed, is that the level of burnout among healthcare professionals differs depending on the department and the healthcare facility of work. The phenomenon is usually more intense in hospitals' emergency rooms, intensive care units and pathology departments. Emergency room nurses are often subjected to physical and verbal abuse due to unmanageable patient flow and understaffing that have exhausted them both physically and mentally (Adriaenssens et al., 2015). By the same token, the often sudden death of a patient causes emergency room nurses to question their capabilities, feel insufficient, feel like a failure, and perhaps experience feelings of guilt (Portero et al., 2020).

A significant percentage of emergency room nurses exhibit symptoms of burnout. Also, many researchers maintain that the percentage of burnout in emergency room nurses is higher than that of nurses working in other hospital departments, as intensive care units, surgery departments etc. (Robin & Leslie, 2006; Adrianenssens et al., 2015).

Anderson et al. (2014) studied the effects of a physical activity programme on the anxiety, depression, occupational stress and burnout syndrome of 580 nursing professionals. The method used was a structured physical activity programme conducted five times per week lasting 10 minutes for a period of three months.This physical activity programme did not yield any noteworthy results on the levels of anxiety, depression, burnout or occupational stress. However, after this interventional programme, the participants reported improved perceptions of bodily pain and the feeling of fatigue at work.

Furthermore a study conducted by Mohebbi et al. (2019), sought to determine the effectiveness of an aerobic exercise programme on the occupational stress of nurses.Sixty nurses working in hospitals affiliated to Shahrekord University of Medical Sciences in Iran took part. Based on the results, what was concluded was that a comprehensive exercise programme helps decrease work stress, and the prospect of incorporating physical activity in day to day life should constitute a new lifestyle and routine for nurses.

The purpose of this research was to investigate the effect of physical activity on burnout syndrome, as regards emergency room nurses in public hospitals. More specifically, the reseach had two sub-objectives. The first was to record and assess the levels of physical activity and burnout in workers, and the second was to detect the relationship between physical activity, as a health behaviour, and burnout in emergency room nurses. The results will also encourage public and private agencies to create and implement appropriate physical activity programmes with the scope to improve nurses' mental and physical health.

Methods

Participants

The research sample consisted of 476 nurses, both male and female, working in public hospital emergency rooms in the 3rd, 4th and 5th Health Regions of Greece. In total 476 questionnaires were filled out and used for statistical analysis. The sample consisted of 355 women and 121 men, with an average age of about 43 years (mean=42.49, SD=9.5). To facilitate date analysis, the participants were grouped in four categories based on data distribution. The first category consisted of nurses in the 22-32 age group, the second in the 33-43 age group, the third in the 44-54 age group and the fourth in the age group 55 and over. For their participation in the research, they should have at least one year of experience in the specific department and be permanent civil servants of the hospitals of the 3rd, 4th and 5th health districts.

Procedures

The participants were informed that all questionnaire answers would be confidential. The questionnaires were completed from January 2022 to April 2022. Each nurse completed three questionnaires, one on physical activity, one on burnout and one on their demographics.

Firstly, permission was requested from the Board and Scientific Council of each hospital for conducting the research, as well as from the Ethics Committee of the Democritus University of Thrace. Permission from the latter was granted on 16/12/2021 under permission no.25075/168. Thereafter, the head and director of the department was informed about the goals and the content of the research. After the briefing, participants were adviced that, a) their participation was voluntary, b) the questionnaires were anonymous, c) absolute confidentiality would be maintained and d) the results would be used solely for scientific purposes.

Measurments

For the assessment of physical activity, the International Physical Activity Questionnaire (IPAQ, short version) (recall period one week) was used (Craig et. al., 2003). Specifically, the said questionnaire consists of 7 questions collecting information on the time consumed daily in vigorous, moderate and walking activities as well as the time consumed sitting at rest over a seven day period. The daily physical activity was assessed in MET (MET is a unit that represents the energy spent sitting at rest. 1 MET=3.5 nil 02/kg body weight/minute,

which is the oxygen consumed sitting at rest), as per the official protocol of IPAQ Being. Three classification categories of physical activity were built based on the values: a) low physical activity, b) moderate physical activity, c) high physical activity.

For the assessment of burnout, the Maslach Burnout Inventory was used, which has been adapted to facilitate the Greek population (Kantas & Vassilaki, 1997). The questionnaire consists of 22 questions that measure three characteristic burnout dimensions: a) emotional burnout (9 questions), b) depersonalisation (5 questions), c) lack of personal accomplishments (8 questions). The answers given by the respondent are based on a seven-point scale: 0 – never, 1 – a few times annually or less 2 – once a month or less, 3 – a few times a month, 4 – once a week, 5 – a few times a week and 6 – every day. The level of burnout is high when we observe high values in the scales of emotional exhaustion and depersonalisation and low values in the scale of personal accomplishments. On the contrary, the level of burnout is low when we have low values on the scales of emotional exhaustion and depersonalisation and high values on the scales of personal accomplishments (Maslach & Jackson, 1986).

Statistical Analyses

Data analysis was run using the statistical package SPSS 17.0 for Windows. The internal consistency of tests and measures was assessed by using Cronbach's alpha reliability coefficient. Mean and standard deviation and/or medians were used for describing the quantitative variables. Absolute values (N) and relative frequencies (%) were used to describe the qualitative variables. To test the relationship between the three variables of burnout (personal accomplishments, depersonalisation, and emotional exhaustion) the Pearson (r) correlation coefficient was used. Correlation is considered low when the correlation coefficient (r) is between 0.1 and 0.3, moderate when the correlation coefficient is between 0.31 and 0.5 and high when the coefficient is higher than 0.5. Also, in order to examine whether there were differencesin factors between burnout (dependent variable) and the level of physical activity (independent variable) a two-way MANOVA was performed (multivariate analysis of variance), and to test differences between the groups, Scheffe's post hoc test was carried out. The significance level was set to $p<0.05$.

Results

Taking into account the results of the conducted research, the majority of participants (74.6%) were women (N=355) and 25.4% were men (N=121). The ages of the participants ranged from 22 to 60 years. 50.5% were married, 36.3% were single and 13.2% were divorced. 58% of the total sample indicated that they were parents.

As regards the educational level of the employees, most, 51%, were higher technological school graduates (N=245), 39% (N=185) were secondary school graduates, whilst university graduates were a mere 10% (N=46). The percentage of participants holding postgraduate degrees (both university graduates and higher technological school graduates) was only 15.5% (N=74).

The internal consistency of the burnout questionnnaire's factors was tested using Cronbach's alpha coefficient. The results showed that most variables had a high level of internal consistency. The reliability of the internal consistency of the questionnaire on burnout for the factor of emotional exhaustion for the nine questions, was determined to be a=0.86, for the factor of depersonalisation for the five questions it was a=0.80 and for the factor of personal accomplishments for the eight questions, it was determined to be a=0.80.

It was shown, as indicated by the research results, that emergency room nurses display a high level of burnout. The mean of the factor emotional exhaustion is equal to 29.5, the mean of the factor depersonalisation is equal to 13.5, whilst the mean of the factor personal accomplishments, is equal to 28.7 (Table1).

Table 1. Mean, standard deviation of burnout factors.

Factors	(Mean±SD)
Emotional exhaustion	29.5±12.3
Depersonalisation	13.5±7.8
Personal accomplishments	28.7±11.4

Table 2 indicates the participants' level of physical activity, which was divided into three categories (1 = low activity, 2 = moderate activity and 3 = high activity). Analysing the levels of physical activity, it was determined that 44.5% of nurses displayed a low level of physical activity, 33.4% displayed a moderate level of physical activity and 22.1% displayed high activity.

Table 2. Level of Participants' Physical Activity.

Level of activity	N	%
Low activity	212	44.5%
Moderate activity	159	33.4%
High activity	105	22.1%
Total	476	100%

To analyse the variance between burnout factors and physical activity, the Multivariate Analysis of Variance (MANOVA) technique was performed. The purpose of this research, was to examine the research hypothesis regarding the parallel effect of the level of physical activity on burnout dimensions.

This particular analysis is used to study the affect of two or more categorical variables, which in this case will be referred to as factors, on a multitude of quantitative variables. Categorical variables are to be understood as independent variables and quantitative variables are to be understood as dependent ones. The

categorical-independent variable in this specific study is physical activity in three levels (1=low physical activity, 2=moderate physical activity and 3=high physical activity), whilst the dependent variables are the scales of the questionnaires on burnout.

The results of this testing are presented in Table 3 and it was shown, that in all cases, when testing the variables independently, physical activity was a statistically significant factor as regards differences in means. In fact, the significance in all cases was quite high ($p<0.001$). Based on the above, we observe that the level of physical activity effects the factors of burnout. Nurses with a low level of physical activity had higher scores on the variables of burnout, and lower scores on the variables of quality of life, than their co-workers who had a moderate to high level of physical activity.

Table 3. The Effects of Physical Activity on Burnout and Quality of Life.

Physical activity		N	Mean	(±SD)	F(2,473)	P
Emotion exhaustion	Low	212	35.98	11.35	77.50	0.000
	Moderate	159	26.49	10.28		
	High	105	21.07	10.04		
Personal accomplishments	Low	212	24.14	12.21	35.70	0.000
	Moderate	159	31.68	9.63		
	High	105	33.46	8.90		
Depersonalisation	Low	212	16.84	7.60	47.80	0.000
	Moderate	159	12.13	7.06		

The last part of the analysis examines the relationship between the dimensions of burnout using the Pearson Correlation Coefficient. The results in Table 4 show a significant moderate and negative correlation between the participants' personal accomplishments and both emotional exhaustion ($r=-0.446$, $p<0.001$) and depersonalisation ($r=0.541$, $p<0.001$), i.e. the higher the emotional exhaustion or depersonalisation of research participants, the less personal accomplishments are mentioned by them. On the contrary, there was a significant high and positive correlation between emotional exhaustion and the participants' depersonalisation ($r=0.726$, $p<0.001$). This result shows that the higher the participants' emotional exhaustion, the higher the possibility of depersonalisation being mentioned.

Table 4. Pearson Correlation between dimensions of burnout.

	Depersonalisation	Emotional exhaustion	Personal accomplishments
Depersonalisation	1		
Emotional exhaustion	0.726***	1	
Personal accomplishments	-0.541***	-0.446***	1

*p-level=0.05 **p-level=0.01 ***p-level=0.001

Discussion

What we tried to record in this research, was the degree of burnout that emergency room nurses, both male and female, experience, and the benefits that a body activation model provides. It should however be notedthat the results of this research were based on data collected from a specific number of participants and not from the total number of nurses working in all the Health Regions throughout Greece.

As shown by data analysis, physical activity levels of emergency room nurses are not satisfactory – 44.5% of the sample displayed low physical activity and only 22.1% displayed a high one. These findings, are similar to those of the general Greek population but also to those of healthcare profession groups in Greece (Gerovasili, Agaku, Vardavas, & Filippidis, 2015).

A current research conducted in the United Kingdom by Blake, Narayanasamy, Batt & Khunti (2019), reached the same conclusions. 1.452 hospital workers including many nurses working in the National Health System (NHS) participated in the research. 45% of nurses did not meet the guidelines of the recent WHO protocols that recommended 30 minutes of moderate daily physical activity. Reasons mentioned for not taking part in physical activity programmes, were fatigue, non-existent free time as well as incentives. Also other factors causing them to refrain from exercising were lack of time, a feeling of tiredness, lack of incentive, working shifts and animosity at the workplace.

Specifically, in this research, the testing of the first statistical hypothesis, was to determine whether emergency room nurses, both male and female, developed burnout syndrome. It was ascertained that healthcare professionals displayed high burnout levels having a high score on the factors of emotional exhaustion and depersonalisation and low scores on the factor of personal accomplishments.

The results of this research coincide with the research of Portero et al. (2020), indicating that 56% of emergency room nurses experience burnout. Some causes leading to this is a very demanding job, an increased workload plus an emergency room packed with people causing confusion and frustration. However, in a study where 30 emergency room nurses participated, a manual of cultural change was introduced with specific interventions in the workplace, based on bibliographical suggestions. The subject matter of the manual was the fundamental acknowledgement of the employees and their participation in decision-making and leadership. Measurements of burnout were taken before and after the interventions, and results showed that the prevalence of burnout was significantly decreased (Adams, Hollingsworth, & Osman, 2019).

Furthermore, in this research, the statistical hypothesis, was tested, as to the degree to which the indiators of burnout differ when correlated to the level of physical activity.

Analysing the results, it was found that nurses with a high and moderate physical activity level display lower levels of burnout and score higher on the factor of quality of life, compared to nurses with low activity levels. Thusly, we confirm the hypothesis that the level of burnout and the quality of life of emergency room nurses, both male and female, differ when correlated to the level of physical activity.

The protective role that physical activity may have on the symptoms of burnout are also supported in the Peterson et al. (2008), research. On the other hand, the research of Papadimitriou et al. (2008), did not deem the correlation between physical activity and burnout to be statistically significant. It appears that exercise alone cannot alleviate the symptoms of burnout, but that in addition, a number of other preventive and coping strategies are also required to manage this multifaceted problem. Nevertheless, in Bährer's (2018), research, good eating habits and exercise combined with necessary rest, can build up the condition of the human body and prevent both the appearance and the evolution of burnout. These measures can, each in its own special way, perceivably lower the levels of stress build-up, that would lead nurses to experiencing chronic stress and burnout.

In conclusion, burnout is a serious problem in contemporary workplaces, in an era where public health is under the microscope of both society and the state. Public health cannot afford to be dysfunctional, ineffective or anunreliable tool of a modern state that continuously expects higher levels of attainment (Maslach & Leiter 1999).

Nurse burnout in the healthcare sector impacts work performance. The degradation of the quality of services directly impacts their physical and mental well-being. In particular, the last two years, due to the emergence of the SARS-CoV-2 pandemic, emergency room nurses are in the front line of healthcare services, working intensively under unprecedented clinical pressure due the increasing cases of Covid-19. Thus the early recognition of burnout syndrome, contributes to better professional behaviour and to the provision of high quality nursing care to patients.

Healthcare professionals, should engage in activities that provide psychological detachment from work, require no effort, and are harmonised with the latest protocols of therapeutic exercise. Physical activity can also be applied within the hospital premises, under the condition that appropriate structures, ensuring a better and more supportive environment, be put in place. This will result in professionals providing improved healthcare services (Manomenidis, Panagopoulou, & Montgomery, 2016).

Limitations

The sample size of the research was adequate for generalisation of the results as regards the population under study. However, generalising the results of the nurses as a whole, regardless of their level of education (University graduates, Higher technological school graduates, secondary school graduates) should be avoided. Moreover, even though the questionnaires were anonymous, it's impossible to verify the honesty of the answers of research participants. Therefore, future studies with a larger sample size are needed to confirm the results of this study. Nursing and Physical Education are scienceswhose main goal is to help individuals adapt to physical activity, extending advice and providing information on the benefits and potential dangers. Thus, within the framework of disease prevention, health maintenance and health promotion by exercising correctly and side stepping possible harmful exercises, individuals will indubitably experience an enhancement of their physical and mental well-being in their everyday life.

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Conflict of interest
The authors declare that there is no conflict of interest.

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