

The Effect of Physical Activity on the "Burnout" Syndrome and the Quality of Life of Nurses Working in Psychiatric Centers

Rallou Paniora,¹ Ourania Matsouka,² Yannis Theodorakis²

Η επίδραση της Φυσικής Δραστηριότητας στο «Σύνδρομο Εξουθένωσης» και στην Ποιότητα Ζωής των Νοσηλευτών που Εργάζονται σε Ψυχιατρικά Κέντρα

Περίληψη στο τέλος του άρθρου

¹Nurse, Akesios North Aegean
Dialysis Center of Polystylo Kavala,

²University of Thessalia, Department
of Physical Education and Sport, Greece

Υποβλήθηκε: 02/07/2017
Επανυποβλήθηκε: 24/08/2017
Εγκρίθηκε: 05/09/2017

Corresponding author:
Rallou Paniora, 24 Vroutou street,
GR-653 02 Kavala, Greece
Tel: (+30) 6942 463 459,
e-mail: rallou83@gmail.com

Introduction: The term "burnout syndrome" in nursing is used to describe a state of emotional, mental, and physical exhaustion related to work related stress. According to Fallowfield, the quality of life is determined by the interaction between physical, mental and social well being. The term physical activity includes all forms of exercise of the human body, sports and workout which activate the muscles of the body and require increased energy consumption. **Purpose:** The purpose of this study is to investigate the effect of physical activity on burnout syndrome and the quality of life of nurses and nurse assistants working in psychiatric centers in Greece. **Material and Method:** In total 100 mental health nurses and nurse assistants, working in psychiatric centers in the 4th health region (Eastern Macedonia and Thrace in Greece), participated the study (49 women and 51 men, mean age=35.64±9.46 years). The 36-item short-form health questionnaire (SF-36) was used to assess the quality of life, the Maslach Burnout Inventory to assess burnout syndrome and the questionnaire of Godin & Sephard to measure the physical activity in the individual's free time. A probability value of 5% was considered as statistically significant. All calculations were conducted using SPSS for Windows (v. 16.0, SPSS Inc, Chicago, IL). **Results:** The levels of burnout in our sample of nurses and nurse assistants working in psychiatric centers were low. We also found that mental health nurses do not experience a high level of professional exhaustion. Moreover, physical activity does not affect the levels of burnout. However, it was the only variable that influenced positively the personal achievement (F=2.296, p=0.041). We also concluded that physical activity had an impact on the quality of life of the participants. More specifically, the mean values were 81.15±19.42 for the subscale physical functioning, 68.75±35.6 for the physical role, 51.80±17.28 for bodily pain, 50.38±9.5 for the subscale of general health, 71.87±21.93 for vitality, 61.66±40.8 for emotional role

and finally 61.64 ± 10.63 for mental health. **Conclusions:** Physical activity seems that has no effect on the levels of burnout. However, we found that it has an impact on the quality of life of mental health nurses. In conclusion, the levels of burnout among mental health nurses working in psychiatric wards are quite low.

Key-words: Burnout, physical activity, quality of life, nurses, mental hospital, SF36.

Introduction

Physical activity is a broad term which refers to all forms of motion of the human body i.e. every physical exercise and sport which activates the muscles of the body and requires increased energy consumption. The term sport refers strictly to a structured physical activity, with strict rules, high competition and specialization, the main purpose of which is to maximize performance. The term physical exercise or workout according to Berger et.al, refers to any systematic exercise, body movement or participation of the person in physical activities, which have some duration but lower levels of competition and involve mainly large muscle parts of the body.¹

Physical exercise is considered among the most important regulators of human health. Health professionals generally record the levels of physical activity when assessing their patients and evaluate it as an important determinant of primary prevention for a number of diseases. Also, Khan et al stated that the participation in physical activities is associated with a reduction of 20–40% of all causes of mortality.² Any form of physical activity and especially the regular and organized exercise is considered nowadays as the best means of preventing diseases.^{3,4} Moreover, recent findings indicate that exercise appears to have significant psychological effects not only on the quality of people's life in general, but also on the quality of life of people suffering from chronic or acute health problems.^{5,6}

The term burnout has been increasingly used by psychologists, sociologists, and specialists of personnel management. It was first used in 1974 by Freudenberg, to describe the physical and mental exhaustion of mental health professionals and generally of health professionals working in close relationship with their "patients".⁷

In literature there is a great number of papers referring to the burnout syndrome in nursing. Characteristi-

cally, even almost 20 years ago, Hannigan et al and Killefder et al found that burnout is particularly common among mental health nurses. According to their findings the nursing personnel working in a psychiatric hospital faced intense emotional symptoms of exhaustion due to work difficulties and there was a noticeable absenteeism and turnover rate among psychiatric nurses with high emotional exhaustion, high depersonalization and low personal accomplishment.^{8,9}

The results of Fallowfield suggest that nurses experience high levels of occupational stress and often suffer from work exhaustion namely burnout.¹⁰ In addition, the quality of life is determined by the interaction of three dimensions, including physical, mental and social well-being. The quality of life, was originally identified with the concept of living standards, as they were determined by the possession of things related to the consumer society such as electric appliances, car and home possessions, that were purely material. Elements such as leisure time, the opportunity for vacation and recreation were added later. In the early 60s the term was further extended to include education, health, wellness, financial status and industrial development.

Khan et al claim that there is strong evidence that physical activity can improve mental wellbeing. A study which was carried out in nursing students looked at the relationship between physical activity and mental well-being. Physical activity was measured with the use of the questionnaire of physical activity. The results of Hawker (2012) showed that physical activity can exert a positive influence on improving mental well-being in nursing students. Also, participation in physical activity is associated with a 20–40% reduction in all causes of mortality.¹¹ Additionally, Booth et al (2011) proved that sedentary life is associated with a number of pathological diseases. Moreover, Anokye et al (2012) carried a research in England on the influence of physical activity on people's quality of life which showed that the higher

levels of the physical activity the better the quality of life.^{12,13} Exercise is considered as much an effective anxiety treatment as any other psychotherapeutic or pharmaceutical method and that sometimes it even has better results. Levert et al (2000) concluded that the job of the psychiatric nurse is stressful based on the high scores in all three dimensions of professional burnout.¹⁴

Aim

The aim of this study was to investigate the effect of physical activity on the levels of burnout and quality of life of nurses working in psychiatric clinics in Eastern Macedonia and Thrace (4th NHS Health Region) in Greece.

Material and Method

The study participated 100 mental health nurses (N=53) and nurse assistants (N=47) working in psychiatric centers of the 4th NHS Health Region (Eastern Macedonia and Thrace) in Greece. All the participants completed the questionnaires (100% response rate). They were informed that their confidentiality would be maintained. The study was conducted from April 2015 to July 2015. The research protocol was approved by the Scientific and Ethics Committee of the University of Thessaly.

Each participant completed a simple form of demographics and each of the three study questionnaires: (a) the 36-item short-form health questionnaire (SF-36) scale, (b) the Maslach Burnout Inventory and (c) the Godin & Sephard's questionnaire.

The SF-36 scale is a tool that has been used over the last 20 years to measure the health status of a population and is considered an internationally recognized valid and reliable tool for assessing the quality of life. The Greek version of the scale was used in the present study. It consists of 36 items divided into eight different health dimensions: physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role and mental health. The first four factors are the parts of the questionnaire related to physical health and the other four are related to mental health based on Sherbourne, Ware and Anagnostopoulos et al.^{15,16} The answers were coded, summed up and transformed to a scale from 0 (the lowest level of health) to 100 (the highest level of health). The analysis of the results and the overall

management of missing values were performed according to the procedure recommended by Kalantar-Zadehetal, Kopple & Block.¹⁷

According to Maslach and Jackson questionnaire, emotional exhaustion, depersonalization, and lack of personal accomplishment are the three components that cause the burnout syndrome.¹⁹ The Greek version of Maslach Burnout Inventory was used to assess the degree of burnout. The questionnaire included 22 items that assessed three characteristic dimensions of burnout: (1) emotional exhaustion (9 questions), (2) depersonalization (5 questions), and (3) lack of personal achievements (8 questions). The answers given by the respondent were based on a seven-point Likert scale: never (0), sometimes a year or less (1), once a month or less (2) a few times a month (3) once a week (4) several times a week (5), every day (6). Scores ranged from 0 to 6 for each item. The level of burnout was high when there were high values in the subscales of emotional exhaustion and depersonalization. Based on Kantas & Vassilaki, unlike the two previous components low values in Personal accomplishment are indicative of burnout syndrome.²⁰

The Godin & Sephard questionnaire, which had been adapted and modified for Greek data was used to measure physical activity in a person's leisure time.⁵ It includes questions about the present and past experience of nurses with physical exercise. Considering a seven-day period (of a recent week), it measures the average frequency of exercise in the spare time of the participants lasting for more than 15 minutes as well as its intensity (mild, moderate, severe).

Statistical analysis

A descriptive and statistic frequency analysis followed by statistical calculation and analysis of reliability (index Cronbach's a) a correlation calculation was performed. In addition, a variance analysis for one factor (one way anova) and variance analysis of many factors (one way manova) was implemented as indicated. A probability value of 5% was considered as statistically significant. To facilitate the analysis of the data participate in ants were divided into three categories according to their age. The first category included nurses between 21–31 years, the second between 32–42 years, and the third included nurses aged 43 and above. All calculations were conducted using SPSS for Windows (v. 16.0, SPSS Inc, Chicago, IL).

Results

In total 49 female and 51 psychiatric nurses and nurse assistants with a mean age of 35.64 ± 9.46 (21-60 years) and a mean of 9.82 years of working experience participated the study. The 46% of participants were married, 44% were single, 8% were divorced and 2% were widowed. The 95% of our participants were employed on a full-time basis and only 5% on a part-time basis. In relevance to their educational level a 43% were high school graduates, a 52% graduates of tertiary level (Technological Education Institutes), a 1% graduates of tertiary university level and only 4% held a postgraduate degree. The basic demographic characteristics are presented in table 1.

The internal consistency of the questionnaires of occupational burnout and professional satisfaction was examined with the Cronbach coefficient α . The results showed that most variables have a high degree of internal coherence. The credibility of internal consistency (Cronbach α) for the EE for the nine questions was found to be $\alpha=0.84$, for the de-factorization factor with five questions found (dp) $\alpha=0.776$ and for the personal factor Achievements with the eight questions found (pa) $\alpha=0.88$. Additionally, in the SF-36 questionnaire Cronbach α for the factor "physical functionality" was $\alpha=0.842$ and for the factor "physical role" was $\alpha=0.839$. The reliability factor for the "physical pain" factor was $\alpha=0.846$, the

"general health" factor has a confidence index $\alpha = 0.853$. The factor "vitality" $\alpha=0.853$, the "social function" factor $\alpha=0.841$. The "emotional role" factor had a confidence index of $\alpha=0.842$. Finally, the eighth factor that is "mental health" has a confidence index $\alpha=0.850$.

According to our study results the levels of burnout were low. More specifically the mean score for emotional exhaustion was 24.3, the score for depersonalization was 9.5 where as the score for the factor of personal achievement was 30.8. The analysis of variance one-way anova showed that there was a correlation between physical activity and more particularly between "Intense activity" and the factor "Personal achievements" ($F=2,396$, $p=0.041$).

The means and standard deviations for all the subscales of the quality of life (SF36 scores) are presented in table 2. The descriptive characteristics for the level of physical activity were: Intense exercise (1.37 ± 1.54), Moderate exercise (1.85 ± 1.53), Mild exercise (3.46 ± 1.78) and Total score Physical activity (31.96 ± 17.19). Both the "Intense exercise" ($F=3,405$, $p=0.009$) and the "Mild exercise" ($F=2,973$, $p=0.014$) had a positive influence on the physical functioning subscale in the SF36 questionnaire.

Moreover, the correlation of individual variables were examined. More specifically, the variable "Moderate exercise" was positively correlated with the factor "Physical role" ($F=2,413$, $p=0.046$). Pain symptom was found to influence mild physical activity ($F=2,395$, $p=0.040$). General Health was also positively correlated moder-

Table 1. Demographic characteristics of the sample.

	N=100 (%)
Sex	
Men	51
Women	49
Marital Status	
Unmarried	44
Married	46
Divorced	8
Cheers	2
Education	
<i>Nurses</i>	
University education	1
Technological education	52
<i>Assistant nurses</i>	
Two years education	43
Postgraduate degree	4

Table 2. Means and standard deviations (SD) for all the subscales of the quality of life (SF36 scores).

SF36 (N=100)	Mean	SD
Physical function	81.15	19.42
Natural role	68.75	35.60
Body pain	51.80	17.28
General health	50.38	9.60
Vitality	50.66	10.83
Social functioning	71.87	21.93
Emotional role	61.66	40.85
Mental health	61.64	10.63
Total physical health	54.46	14.50
Total mental health	45.35	15.10
Total score SF36	46.90	13.78

ate exercise ($F=2.389$, $p=0.040$). On contrary, the factor "Vitality" was not affected by "physical activity".

"Intense exercise" and "Moderate exercise" were both correlated with the questions "Over the last four weeks to what degree did your emotional problems prevent you from your normal social activities with family or friends?" and "How much body pain did you have over the last four weeks?" ($F=3,510$, $p=0.005$ and $F=3,206$, $p=0.009$, respectively). Similarly variables "Intense exercise" and "Mild exercise", again for the previous two questions of the factor "Social functionality", they were positively correlated ($F=1,581$, $p=0.145$ and $F=2,728$, $p=0.011$, respectively). Participants were asked to what extent and for how long, their physical fitness and emotional problems have prevented their social activities with family and friends, the majority of nurses them who combined intense and moderate exercise showed absolutely no negative behavior.

The questions "Did you reduce reading time or other activities you did, due to emotional problems over the last four weeks?" and "Over the last four weeks did you accomplish less things that you would like (reading time or other activities) due to emotional problems e.g. depression or anxiety?" were found to have double interaction with the variables "Intense exercise" and "Moderate exercise", as shown, by factor "Physical role" ($F=2,396$, $p=0.040$ and $F=2,879$, $p=0.017$, respectively). More specifically, the nurses did not have negative effects on their job or in their daily activities as a result of some negative emotional problems that they may have been experiencing. That is they did not reduce neither the time of reading or other activities, nor the number of the things they were doing because of negative emotional problems.

In the "Mental health" factor the variable "intense exercise" in question "For how long did you feel despair or depression over the last four weeks?" is $F=2,395$, $p=0.047$ there was found a statistically significant difference. On the dual interaction of the variables "Intense exercise" and "Moderate exercise", in the previous question the factor "Mental health" was $F=3,546$, $p=0.005$, so it denotes a positive effect of "Intense exercise" and "Moderate exercise" on the mental health factor. As far as it concerns the double interaction of the variables "Intense exercise" and "Mild exercise", in the same question, there was found a positive impact on "Mental health" ($F=2,522$, $p=0.017$). This was stated to help to reduce the feeling of depression and despair.

Discussion

The main aim of the current study was to investigate the contribution of physical activity in the burnout syndrome and subsequently in the quality of life of nurses working in psychiatric centers. We found that the incidence of burnout was quite low among psychiatric nurses and that there was a correlation between several variables of physical activity and dimensions of their quality of life.

In general, there is great evidence that supports that physical activity can enhance mental well-being and consequently quality of life. Kheiraoui et al (2012) carried out a survey concerning health professionals, including nurses and concluded that physical activity acts positively on the quality of life of participants, despite the fact that, specifically nurses are less influenced than other health professionals.¹¹ In a recent study with 215 undergraduate student nurses, Hawker (2012) supported that the participation in physical activity can be beneficial in improving mental well-being by increasing self-esteem and life satisfaction and/or regulate anxiety and psychosocial disorders.²²

In our study the incidence of burnout syndrome was very low with the average value of the scale of personal achievements to be higher than the averages of emotional exhaustion and depersonalization. Literature suggests that the burnout syndrome occurs mainly in health professionals such as doctors and nurses as a result of their daily contact with human pain thus its use was restricted to social services professionals, such as physicians, dentists, dental nurses, physiotherapists and social workers. It is supported that emotional exhaustion, depersonalization and lack of personal achievements (reduced feeling of personal accomplishment) constitute the three components leading to burnout.²²⁻²⁴ Rezaei et al (2018) in their study with 200 psychiatric nurses supported that gender and work status are basic determinants of burnout syndrome occurrence among nurses. They found that age, working hours, professional profile and work experiences account for a great variance of depersonalization.²⁵ In accordance, a previous study in Greece (2010) with general nurses working in private and public Hospitals in Crete was found that increased workload, low wages and the working environment are factors contributing to the appearance of the syndrome.²⁶ Another important determinant of burnout syndrome development is the pressure from the patients. As Beechman (2000) supported nurses in comparison to other professions are exposed to pa-

tients' criticism regarding their ability.²⁷ Therefore, as Chakraborty et al (2012) supported, the emotional maturity of psychiatric nurses and their ability to adjust to the working conditions are basic internal predictors of burnout syndrome.²⁸

Our results indicate that levels of physical activity are correlated to the different dimensions of the participated psychiatric nurses' quality of life. These findings are consistent with those of Anokye et al (2012) who also concluded that the high levels of physical activity have a positive effect on the quality of life.¹³ We found that the moderate exercise has an effect on the second factor of "natural role". When participants were asked if they have restricted the types of work or other activities, by doing moderate physical activity they answered negatively. Mild exercise on the other hand, showed a positive effect on the factor "physical pain", and on whether this pain is affecting the work of nurses. In general, we found that nurses that do at least mild exercise they feel healthy. Chin et al (2016) in their study with 394 nurses in California concluded that occupational factors influence the level of physical activity among nurses.²⁹ Another study with 394 Icelandic nurses, reported that more than one in five nurses self-rated his/her physical activity as poor or very poor and reported a variety of symptoms related to burnout and poor quality of life such as sleep disturbances, work absence, excessive stress and others.³⁰ In addition, a recent study (2016) with 623 registered nurses, reported that the majority of the participant failed to achieve the recommended daily levels of physical activity. Their quality of life was influenced by the physical activity and was correlated

with the perceived health status, the working experience and occupational factors.³¹ Concerning the health status it seems that affects not only the physical activity but also stands as a predictor for burnout among nurses.²⁸

Limitations

In the present study, the main constraint was the small but representative convenience sample of nurses that limits the generalization of our conclusions. Another minor constraint was the difficulty in collecting the questionnaires as there was a delay from the participants in the completion of the questionnaires due to their complexity and the extent time for completion.

Conclusions-Suggestions

In our study we found a correlation between physical activity and both quality of life and burnout syndrome. Even the incidence of burnout syndrome among psychiatric nurses seems to be low, further research is recommended to confirm the present findings and to give an insight to the measures that could prevent burnout syndrome and enhance quality of life through physical activity. More specifically, it is proposed to investigate the effect of different types of physical activity on the burnout syndrome among mental health nurses in order to find ways of reducing both its incidence and intensity, so as nurses would become more efficient for the wellness of their patients. There is also a need for more research to be carried out, as it is very limited at present, regarding the effect of physical activity on the quality of nurses' life, and particularly for mental health nurses, in order to improve their physical and mental condition.

ΠΕΡΙΛΗΨΗ

Η Επίδραση της Φυσικής Δραστηριότητας στο «Σύνδρομο Εξουθένωσης» και στην Ποιότητα Ζωής των Νοσηλευτών που Εργάζονται σε Ψυχιατρικά Κέντρα

Ραλλού Πανιώρα,¹ Ουρανία Ματσούκα,² Γιάννης Θεοδωράκης²

¹ΤΕ Νοσηλεύτρια, Akesos North Aegean Dialysis Center Πολύστυλο Καβάλας,

²Πανεπιστήμιο Θεσσαλίας, Τμήμα Επιστήμης Φυσικής Αγωγής Και Αθλητισμού ΤΕΦΑΑ

Δημοκρίτειου Πανεπιστημίου Θράκης Και Πανεπιστημίου Θεσσαλίας

Εισαγωγή: Ο όρος «σύνδρομο εξουθένωσης» στη Νοσηλευτική χρησιμοποιείται για να περιγράψει μια κατάσταση συναισθηματικής, διανοητικής και σωματικής εξάντλησης που σχετίζεται με το εργασιακό άγχος. Σύμφωνα με τον Fallowfield, η ποιότητα ζωής καθορίζεται από την αλληλεπίδραση μεταξύ φυσικής, ψυχικής και κοινωνικής ευημερίας. Ο όρος σωματική δραστηριότητα περιλαμβάνει όλες τις μορφές άσκησης του ανθρώπινου σώματος, τον αθλητισμό και τη φυσική άσκηση που ενεργοποιούν τους μύες του σώματος και απαιτούν αυξημένη κατανάλωση ενέργειας. **Σκοπός:** Σκοπός της παρούσας μελέτης ήταν η διερεύνηση της επίδρασης της φυσικής δραστηριότητας στην εμφάνιση του συνδρόμου εξουθένωσης και στην ποιότητα ζωής των νοσηλευτών και βοηθών νοσηλευτών που εργάζονται σε ψυχια-

τρικά κέντρα στην Ελλάδα. **Υλικό και Μέθοδος:** Συμμετείχαν συνολικά 100 νοσηλευτές και βοηθοί νοσηλευτών ψυχικής υγείας, που εργάζονται σε ψυχιατρικά κέντρα στην 4η περιοχή υγείας (Ανατολική Μακεδονία και Θράκη στην Ελλάδα) (49 γυναίκες και 51 άνδρες, μέση ηλικία=35,64±9,46 έτη). Το ερωτηματολόγιο υγείας (SF-36) χρησιμοποιήθηκε για να εκτιμηθεί η ποιότητα ζωής, το ερωτηματολόγιο Maslach Burnout Inventory για την αξιολόγηση του συνδρόμου εξουθένωσης και το ερωτηματολόγιο των Godin & Sèphard για τη μέτρηση της σωματικής δραστηριότητας στον ελεύθερο χρόνο. Το επίπεδο στατιστικής σημαντικότητας ορίστηκε στο 5%. Όλοι οι υπολογισμοί διεξήχθησαν χρησιμοποιώντας το SPSS για Windows (v. 16.0, SPSS Inc, Chicago, IL). **Αποτελέσματα:** Τα επίπεδα εξουθένωσης στο δείγμα νοσηλευτών και βοηθών νοσηλευτών ψυχικής υγείας της μελέτης ήταν χαμηλά. Διαπιστώσαμε επίσης ότι οι νοσηλευτές ψυχικής υγείας δεν αντιμετωπίζουν υψηλό επίπεδο επαγγελματικής εξάντλησης. Επιπλέον, η σωματική δραστηριότητα δεν φαίνεται να επηρεάζει τα επίπεδα εξουθένωσης. Ωστόσο, ήταν η μόνη μεταβλητή που επηρέασε θετικά την υποκλίμακα των ατομικών επιτευγμάτων ($F=2.296$, $p=0,041$). Επίσης, βρέθηκε ότι η σωματική δραστηριότητα είχε αντίκτυπο στην ποιότητα ζωής των συμμετεχόντων. Πιο συγκεκριμένα, οι μέσες τιμές ήταν 81,15±19,42 για τη φυσική λειτουργία, 68,75±35,6 για το σωματικό ρόλο, 51,80±17,28 για τον σωματικό πόνο, 50,38±9,5 για την υποκλίμακα γενικής υγείας, 71,87±21,93 για τη ζωτικότητα, 61,66±40,8 για τον συναισθηματικό ρόλο και τέλος 61,64±10,63 για την ψυχική υγεία. **Συμπεράσματα:** Η σωματική δραστηριότητα φαίνεται ότι δεν έχει καμία επίδραση στα επίπεδα εξουθένωσης. Ωστόσο, διαπιστώσαμε ότι έχει αντίκτυπο στην ποιότητα ζωής των νοσηλευτών και βοηθών νοσηλευτών ψυχικής υγείας. Συμπερασματικά, τα επίπεδα εξουθένωσης του νοσηλευτικού προσωπικού που εργάζονται σε ψυχιατρικά τμήματα είναι αρκετά χαμηλά.

Λέξεις-ευρητήριο: Εξουθένωση, σωματική δραστηριότητα, ποιότητα ζωής, νοσηλευτές, νοσοκομείο, SF36.

✉ **Υπεύθυνος αλληλογραφίας:** Ραλλού Πανιώρα, Βρούτου 24, 653 02 Καβάλα, Τηλ.: (+30) 6942 463 459, e-mail: rallou83@gmail.com

Βιβλιογραφία

- Berger B, Pargman D, Weinberg RS. Foundations of exercise psychology. 2nd ed. Morgantown: Fitness information technology, 2007
- Khan KM, Thompson AM, Blair SN, Sallis JF, Powell KE, Bull FC, Baumam AE. Sport and exercise as contributors to the health of nations. *Lancet* 2012, 380:59–64
- Antonakoudis GC, Antonakoudis XG. The anti-atrophic effect of exercise. *Hippocrates* 2003, 7:3–11
- Paffenbarger R. Physical activity and fitness for health and longevity. *Research Quart Exerc Sport* 1996, 67:11–30
- Theodorakis G, Hassandra M. Smoking and exercise. Part 2: Disputes between trainees and non-trainees. *Search Physic Educ Sport* 2005, 3:239–248
- Theodorakis G. *Exercise, mental health and quality of life*. Thessaloniki, Christodoulides, 2010
- Freudenberger HJ. Staff burnout. *J Soc Iss* 1974, 30:159–165
- Hannigan B, Edwards D, Coyle D, Fothergill A, Burnard P. Burnout in mental health nurses: findings from the all Wales stress study. *J Psychiatr Ment Health Nurs* 2000, 7:127–134
- Kilfedder CJ, Power KG, Wells TJ. Burnout in psychiatric nursing. *J Advanc Nurs* 2001, 34:383–396
- Fallowfield L. *Quality of life: the missing measurement in health care*. London, Human horizon, Series souvenir Press, 1990
- Hawker CL. Physical activity and mental well-being in student nurses. *Nurs Educ Tod* 2012, 32:325–31
- Booth JN, Bromley LE, Darukhanavala AP, Whitmore HR, Imperial JG, Penev PD. Reduced physical activity in adults at risk for type 2 diabetes who curtail their sleep. *Obesity* 2011, 20:278–284
- Anokye NK, Trueman P, Green C, Pavey TG, Taylor RS. *Physical activity and health related quality of life*. BMC Publid Health 2012, 12:624
- Lever T, Marilyn L, Ortlepp K. Burnout in psychiatric nurses: contributions of the work environment and a sense of coherence. *South Africa J Psychol* 2000, 30:36–43
- Sherbourne CD, Ware JE. The MOS 36-item. Short form. Health survey (sf-36): I. Conceptual framework and item selection. *Med Care* 1992, 30:473–483
- Anagnostopoulos F, Niakas D, Pappa E. Construct Validation of the Greek SF-36. *Health Surv Qual Life Research* 2005, 8:1959–1965
- Kalantar-Zadeh K, Block G et al. Association between SF-36 quality of life measures and nutrition, hospitalization, and mortality in hemodialysis patients. *J Am Soc Nephrol* 2001, 12:2797–2806
- Godin G, Shephard RJ. A simple method to asses exercise behavior in the community. *Can J Appl Sport Sci* 1985, 10:141–146
- Maslach C, Jackson SE. *Maslach burnout inventory*. California, Palo Alto Consulting Psychologists Press, 1986
- Kantas A, Vassilaki E. Burnout in Greek teachers: Main findings and validity of the Maslach burnout inventory. *Work & Stress* 1997, 11:94–100

21. Kheiraoui F, Gualano MR, Mannocci A, Boccia G. Quality of life among healthcare workers: a multicenter cross sectional study in Italy. *Publ Health* 2012, 126:624–629
22. Jimmieson NL. Employee reactions to behavioural control under conditions of stress the moderating role of self-efficacy. *Work & Stress* 2000, 14:262–280
23. Demir A, Ulosoy M, Ulosoy MF. Investigation of factors influencing burn out levels in professional and private lives of nurses. *Intern J Nurs Stud* 2003, 40:807–827
24. Anagnostopoulos F, Papadatou D. Factorial composition and internal coherence of the burnout recording questionnaire in a sample of nurses. *Psychiatr Iss* 1992, 51:183–202
25. Rezaei O, Habibi K, Arab Ghahestany D, Sayadnasiri M, Armoon B et al. Factors related to job burnout among nurses in the Razi Psychiatric Hospital, Iran. *Int J Adolesc Med Health* 2018, Mar 3. pii:/ijamh.ahead-of-print/ijamh-2017-0146/ijamh-2017-0146.xml.
26. Stavropoulou A, Papadaki E, Fylaki A, Kambas E. Burnout syndrome: Understanding and Early Recognition of Syndrome by Nursing Staff in Public and Private Hospitals. *Step Asklip* 2010, 3
27. Beechman L. BMA warns of stress suffered by senior doctors. *Br Med J* 2000, 29:42–43
28. Chakraborty R, Chatterjee A, Chaudhury S. Internal predictors of burnout in psychiatric nurses: An Indian study. *Ind Psychiatry J* 2012, 21:119–124
29. Chin DL, Nam S, Lee SJ. Occupational factors associated with obesity and leisure-time physical activity among nurses: A cross sectional study. *Int J Nurs Stud* 2016, 57:60–69
30. Sveinsdóttir H, Gunnarsdóttir HK. Predictors of self-assessed physical and mental health of Icelandic nurses: results from a national survey. *Int J Nurs Stud* 2008, 45:1479–1489
31. Bakhshi S, Sun F, Murrells T, While A. Nurses' health behaviours and physical activity-related health-promotion practices. *Br J Commun Nurs* 2015, 20:289–296