

## Quality of life of emergency department nurses in pediatric and general hospitals in Greece: A cross sectional study

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### Abstract

**Introduction:** The Emergency Department (ED) is a quite stressful workplace for nurses, affecting their quality of life. The existence of factors that affect the quality of life of ED nurses in daily clinical practice, leads to exhausted nurses. Consequently, there is a need to find the factors and the implementation of interventions that will improve the quality of life of nurses.

**Purpose:** To investigate the factors that affect the quality of life of nurses in children's and adult hospitals.

**Method:** The sample of this cross-sectional study consisted of ED nurses in children's and adult hospitals in Greece. To assess the nurses' quality of life, the WHOQOL-BREF questionnaire was used for the ED nurses. Analysis was done with IBM SPSS 26.0. A value of  $p < 0.05$  was considered as the level of significance and all statistical tests were two-tailed.

**Results:** Study population included 210 nurses. No statistical significance was found for the relationship between pediatric ED nurses and adult ED nurses regarding their quality of life, sleep, and fatigue. However, a statistically significant relationship was found regarding social relationships tending to a better score in pediatric nurses compared to adults ( $p = 0.011$ ). In all five dimensions of life evaluated by the tool, the quality of life of the nurses in our sample was at moderate levels (Mean-General=69.32, Mean-Physical health=64.70, Mean-Psychological health=67.85, Mean-social relations=69.01 and Mean-Environment =57.60).

**Conclusion:** One or more factors are sufficient to affect or have an impact on the quality of life, sleep completeness and fatigue levels of ED nurses.

**Keywords:** Quality of life; Pediatric nurse; ED nurse; Emergency department

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## 1. Introduction

People's quality of life began to be of intense interest to researchers since the 1930's. [1, 2] World Health Organization (WHO) dealt since the 1970s, with the quality of life of workers in their workplace and developed appropriate assessment tools. Shifting hours are an increasingly common feature of modern society. Currently, almost 1/5 of all workers worldwide are engaged in shift work, while approximately 19% of workers in the European Union participate in a night shift. [3, 4] Emergency Department (ED) is a particularly stressful work environment, with a significant workload, which contributes to intense physical fatigue and increased stress levels. [5, 6] It has also been shown that in nursing staff working in alternating hours there is increased fatigue and sleepiness due to reduced amount of sleep. [4] According to Mayeroff (1971), the quality of provided care and its consequences largely depend on the physical, mental and spiritual health of the nurses. [1, 7] In particular, working conditions of nurses in the Emergency Department (ED) are very demanding throughout the duration of care. Quality of life (QoL) of nurses in the workplace is a multidimensional concept where employees can meet their personal needs such as satisfaction, safety at work and sense of well-being achieved by their work. [3] Abbasi (2017) in his study, states that nurses are considered as an integral part of the health care system. [8] However, nursing staff are exposed to a higher level of occupational stress in relation to other health professionals and thus affecting their quality of life. [8,9] Jathanna (2014) showed in her study that ED nurses compared to other departments had high rates of quality of life by giving smaller results in the indication of psychological fatigue. [10] The study of Korompeli (2014), found that nurses working in a rotating shift, compared to nurses working only in the morning, tend to have more need for sleep although they have an extra day of rest per week from the night shift. [4]

The aim of the study was to investigate the factors that affect the quality of life of nurses in children's and adult hospitals.

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## 2. Methods

### 2.1. Sample and population

This cross-sectional study was conducted in EDs of tertiary public Hospitals of Greece from September 2019 to October 2021. The target group was ED nurses working exclusively in ED. Power analysis was applied to select the sample size. Given that probability of committing a statistical error should be 5% ( $\alpha=0.05$ ), and the study's ability to correctly reject the null hypothesis (1-b) needs to meet the minimum acceptable threshold of 0.8 (80% power), sample size was calculated up to 168 nurses approximately. The inclusion criteria in the present study were: a) registered nurses working exclusively in EDs of tertiary Hospitals, b) nurses who had at least one year of experience in the ED and c) native speakers in Greek. Therefore, nurses from 21 ED departments, 210 participants in total, were recruited for the study. Participation ratio was 96.33% (210 out of 218 participants).

### 2.2. Data collection procedure

Approval from the Scientific and Ethical Committee of all hospitals was obtained prior to any data collection. All participants were informed about the purpose of the study by the principal investigator, after which informed consent was signed. The questionnaire investigating the quality-of-life (QoL) that is used internationally by the World Health Organization (WHO) (WHOQOL-BREF) was used to evaluate the quality of life of the nurses. The questionnaire consists of 30 questions. Four QoL themes plus a general dimension (Greek version) are included: (a) physical health and level of independence (9 questions), (b) psychological health and spirituality (6 questions), (c) social relationships (5 questions), and (d) environment (8 questions). Score on each factor ranges from 4 to 20 points. The higher the score on each factor, the better the individual's QoL on that factor. [11-13]

### 2.3. Data Analysis

Sample size was calculated setting statistical power up to 80% with a significance level of  $p<0.05$ , using G Power 3.1. Study data were analyzed by the IBM SPSS 26.0 (Statistical Package of Social Sciences). Questionnaire reliability was checked by internal consistency coefficient Cronbach-alpha. Kolmogorov-Smirnov and Shapiro-Wilk tests were applied for normality investigation. At the level of univariate analysis, categorical data are expressed as absolute and relative (%) frequencies, while quantitative variables are presented as mean values and standard deviations. At the level of bivariate analysis, the results were analyzed and processed with parametric statistical tests comparing the mean values (t-test for independent samples with calculation of the 95% confidence intervals of the difference in the mean values, paired t-test, ANOVA test) and using the corresponding non-parametric Mann-Whitney, Wilcoxon paired and Kruskal-Wallis tests as well. Cohen's d coefficient and 95% confidence intervals were calculated for the effect size of the difference in mean values. The  $\chi^2$  criterion and Fischer exact test were used to test the relationship or difference

between two qualitative variables, while the effect size of the difference was estimated by calculating the Crammer's V coefficient. Furthermore, correlations between quantitative variables that followed the normal distribution were performed by calculating the Pearson's r coefficient, whilst the Spearman's rho coefficient was used in the opposite case. A value of  $p=0.05$  was considered as the level of significance, all statistical tests were two-sided and results that had values less than 0.05 were considered statistically significant.

### 3. Results

#### 3.1. Demographic Characteristics

Study population included 210 nurses. Among them, 85.2% were females (178/210). Mean age was 43.0 years, whilst most nurses had children (120/210, 57.1%), mostly 2 per family (78/118, 66.1%). Demographic characteristics of participants are shown in Table 1.

**Table 1** Participants' demographic characteristics

Variables	N	%
<i>Gender</i>		
Male	31	14.8
Female	178	85.2
<i>Educational level</i>		
Technological School	139	66.3
University	15	7.1
MSc	56	26.7
<i>Marital status</i>		
Single	68	32.7
Married	113	54.3
Separated	5	2.4
Divorced	19	9.1
Widow/er	3	1.4
<i>Habit</i>		
Alone	55	27.4
Cohabit	146	72.6
<i>Health self-assessment</i>		
Very bad	14	6.8
Bad	4	2.0
Neither good, nor bad	25	12.2
Good	99	48.3
Very good	63	30.7

#### 3.2. QoL and health status

Cronbach's alpha was assessed to establish the internal consistency of the WHOQOL-BREF and its dimensions (themes). These results are presented in Table 2. It seems that Cronbach's alpha for WHOQOL-BREF in total, as well as its dimensions ranged from 0.74 to 0.88, showed a good reliability, except for "psychological" and "environment"

dimensions where Cronbach's alpha was estimated under the limit of 0.70. Means, standard deviations, medians, IQRs and 95% CI for the means of WHOQOL-BREF are presented in Table 3.

**Table 2** Internal consistency of WHOQOL-BREF and its dimensions

Dimension	N	Cronbach's alpha
General	2	0.74
Physical health	9	0.76
Psychological	6	0.58
Social relationships	5	0.79
Environment	8	0.69
Total	30	0.88

**Table 3** Means, standard deviations and 95% CI of WHOQOL-BREF

Tool/Scale	Mean (M)	Standard deviation (SD)	95% CI	
			Min	Max
Quality of Life WHOQOL-BREF				
General	69.32 (16.62)	75.0 (12.50)	67.05	71.58
Physical health	64.70 (13.80)	66.67 (19.44)	62.83	66.58
Psychological	67.85 (15.76)	66.67 (16.67)	65.70	69.99
Social relationships	69.01 (15.02)	70.0 (20.0)	66.97	71.06
Environment	57.60 (11.70)	56.25 (15.63)	56.01	59.20

### 3.3. General dimension

The scores of WHOQOL-BREF general dimension were statistically significant related to individuals' self-reports about the general quality of their health ( $x^2=73.32$ ,  $df=4$ ,  $p<0.001$ ), as well as to recent health problems ( $U=3478.5$ ,  $z=-2.85$ ,  $p=0.004$ ). Healthy nurses tended to score higher and had a better QoL, in comparison to their colleagues with health problems, especially those who had rheumatoid arthritis ( $U=1280.0$ ,  $z=-2.40$ ,  $p=0.018$ ), diabetes ( $U=162.0$ ,  $z=-2.13$ ,  $p=0.031$ ), chronic mental disease ( $U=220.0$ ,  $z=-2.23$ ,  $p=0.023$ ) and dysfunction in the legs ( $U=1005.5$ ,  $z=-2.67$ ,  $p=0.006$ ). No statistically significant difference was found between pediatric nurses and nurses working with adults (Table 4)

### 3.4. Physical health

Physical health of WHOQOL-BREF was statistically significant related to the family and the children ( $t=2.77$  (208),  $p=0.006$ , 95%CI: 1.50-8.97, Cohen's  $d=0.39$ , 95%CI: 0.11-0.66). Nurses without children reported better physical health. Moreover, there was a statistically significant difference between healthy nurses and their colleagues with recent health problems ( $t=3.98$  (205),  $p=0.006$ , 95%CI: 4.05-11.99, Cohen's  $d=0.60$ , 95%CI: 0.30-0.90). Health problems that were statistically related to lower scores in physical health were: a) rheumatoid arthritis ( $t=2.03$  (205),  $p=0.044$ , 95%CI: 0.17-12.95, Cohen's  $d=0.48$ , 95%CI: 0.01-0.94), b) diabetes ( $t=2.37$  (205),  $p=0.02$ , 95%CI: 2.76-30.07, Cohen's  $d=1.2$ , 95%CI: 0.2-2.19), c) chronic mental disease ( $t=3.2$  (205),  $p=0.002$ , 95%CI: 7.52-31.74, Cohen's  $d=1.45$ , 95%CI: 0.55-2.34) and d) dysfunction in the legs ( $t=4.69$  (205),  $p<0.001$ , 95%CI: 9.08-22.27, Cohen's  $d=1.19$ , 95%CI: 0.68-1.69). There was no statistically significant difference between pediatric nurses and nurses who were working with adult patients (Table 4).

### 3.5. Psychological

The scores of WHOQOL-BREF psychological dimension were statistically significant related to individuals' self-reports about the quality of their health ( $x^2=28.07$ ,  $df=4$ ,  $p<0.001$ ), and the presence of chronic mental disorders ( $U=237.5$ ,  $z=-$

2.03,  $p=0.042$ ). No other demographic factors were found to be statistically significant. Moreover, there was no statistically significant difference between pediatric nurses and nurses working with adult patients (Table 4).

### 3.6. Social relationships

A statistically significant difference was found between the scores for social relationships dimension of WHOQOL-BREF and nurses' marital status ( $F_{4,203}=4.19$ ,  $p=0.003$ ,  $\eta^2=0.08$ , 95%CI: 0.01- 0.14). More specifically, there was a statistically significant difference between single nurses and those divorced ( $p=0.002$ , Cohen's  $d=0.83$ , 95%CI: 0.30-1.36), as well as between married nurses and those divorced ( $p=0.002$ , Cohen's  $d=0.81$ , 95%CI: 0.31-1.31). There was also a statistically significant difference between nurses working with pediatric patients and their colleagues working with adults ( $U=1658.5$ ,  $z=-2.55$ ,  $p=0.011$ ). Pediatric nurses tended to score higher in social relationships dimension of WHOQOL-BREF (Table 4).

### 3.7. Environment

A negative and weak statistically significant correlation was found between the dimension "environment" of WHOQOL-BREF and nurses' age (Spearman's  $\rho=-0.21$ ,  $p=0.004$ ). Younger nurses tended to report higher scores. Furthermore, environment scores were statistically significant in relation to educational level ( $F_{5,204}=2.49$ ,  $p=0.032$ ,  $\eta^2=0.06$ , 95%CI: 0.0-0.11), marital status ( $F_{4,203}=5.81$ ,  $p<0.001$ ,  $\eta^2=0.10$ , 95%CI: 0.03-0.17), with single nurses reporting better scores than the married ones ( $p<0.001$ , Cohen's  $d=0.70$ , 95%CI: 0.39-1.01), having children ( $t=4.85$  (208),  $p<0.001$ , 95%CI: 4.45- 10.57, Cohen's  $d=0.68$ , 95%CI: 0.39-0.96), living together with other people ( $t=-2.17$  (199),  $p=0.031$ , 95%CI: -7.61- -0.37, Cohen's  $d=-0.34$ , 95%CI: -0.66- -0.03) and suffering from dysfunction in the legs ( $t=2.20$  (205),  $p=0.03$ , 95%CI: 0.66-12.23, Cohen's  $d=0.56$ , 95%CI: 0.06-1.05). Healthy nurses without children living alone tended to report better scores on environment dimension. No statistically significant difference was found between pediatric nurses and nurses working with adults (Table 4)

**Table 4** Comparison of nurses' QoL in relation to their workplace (pediatric or general hospitals)

Quality of life	General hospitals					Pediatric hospitals					P
	Mean (SD)***	95% CI <sup>d</sup>	Median (IQR) <sup>‡</sup>	Range	Min Max	Mean (SD)***	95% CI <sup>d</sup>	Median (IQR) <sup>‡</sup>	Range	Min Max	
General*	68.58 (16.93)	66.11 71.05	75.0 (12.5)	0	100.0	74.52 (13.45)	69.09 79.95	75.0 (25.0)	50.0	100.0	0.13
Physical health*	63.97 (13.30)	62.04 65.91	64.76 (19.44)	30.56	88.89	69.86 (16.33)	63.26 76.45	70.83 (19.97)	41.67	122.2	0.12
Psychological*	67.45 (16.28)	65.08 69.82	66.67 (16.67)	33.33	195.83	70.67 (11.39)	66.07 75.28	68.75 (16.67)	45.83	95.83	0.20
Social relationships*	68.03 (15.21)	65.82 70.24	70.0 (15.0)	20.0	100.0	75.96 (11.66)	71.25 80.67	75.0 (11.25)	55.0	100.0	0.011
Environment**	57.57 (12.03)	55.82 59.32	56.25 (15.63)	21.88	84.38	57.81 (9.24)	54.08 61.54	57.81 (13.28)	37.5	78.13	0.92

\* Mann-Whitney test <sup>d</sup>95% CI <sup>‡</sup>IQR \*\* t-test \*\*\*Standard deviation (SD)

## 4. Discussion

Sustainability of human resources is fundamental to achieving the strategic goals of organizations. Specifically for health systems, nurses' QoL has been of great interest in recent years, as it is directly related to the quality of the provided health care. Nurses' QoL seems to be work-related and is an important factor influencing individual and organizational outcomes. [14] Nurses' good QoL ends up to providing better care, job satisfaction and lower rates of resignation. [15-17] In the present study, ED nurses' QoL was found to be at moderate levels and tended to be related to sleep disorders. However, nurses did not rate their fatigue highly, which seems to depend on lack of sleep and nurses' age.

Due to the direct relation between nurses QoL and the quality of provided care, QoL has been extensively studied in international literature and in a variety of health systems. In our study, we used the WHOQOL-BREF tool (Greek version), that has been used to study the QoL of nursing staff in previous studies. [12, 18-20] We found that nurses' QoL

was moderate in the five dimensions of the WHOQOL-BREF. Similar results have been found in studies conducted in different countries and health systems, showing that nurses' QoL worldwide fluctuates at moderate levels. Several factors, such as salary, nurse's personality, the risk of an occupational accident, work-related stress, work environment, nursing management and leadership, as well as the opportunity of promotion may affect nurses QoL. [21-24] In addition, ED nurses' QoL decreased dramatically during the Covid-19 pandemic, most probably because of the high stressful working environment. [20]

Among the hospital departments where nurses' QoL was studied, ED and ICU nurses reported the lowest QoL scores. [23] In the study of Hooper et al (2010) conducted in the USA, it was found that ED nurses scored higher levels of physical fatigue and psychological exhaustion, also reporting a lower score on the general quality of life assessment scale, compared to nurses working in nephrology, oncology department and ICU. [25] This diversity between hospital departments reflects probably the physical and psychological distress that the environment brings to the nursing staff. [26] However, there are studies with controversial findings, such as the study of Jathanna et al (2014), who found that ED nurses reported a higher score in assessing quality of life, and a lower one evaluating psychological fatigue. [10]

In our study, ED nurses' psychological health was found to be at moderate levels. Nursing is inherently considered a stressful job, with a plethora of work-related stressors such as exposure to death and frustration caused by the patient's death, intense sound conditions in workplace, interpersonal conflicts, lack of knowledge and insufficient social support. [27] The ICT environment requires fast decision-making, specialized and well-trained nursing staff and on time actions. At the same time, ED nurses must not only perform accurate clinical assessments but also remain vigilant in order to respond quickly to patient's health status changes. [28] Supporting factors such as peer-support in the workplace, including support from colleagues and supervisors, can help to address the negative health effects of high work-related stress.

The study took place in emergency departments of both pediatric and general hospitals in Greece. In the study of Koinis et al (2014) performed in a sample of nurses working in a regional hospital in Greece, nurses' QoL was positively correlated to gender, marital status and fewer years of work. Moreover, in this study, female nurses had better physical health than the male ones. [29] In our study, nurses in regional hospitals reported a greater feeling of energy loss and burnout than nurses in urban hospitals ( $p=0.011$  and  $p=0.033$  respectively), but there was no gender difference. The comparison between nurses' QoL working in pediatric and adult EDs revealed no statistically significant difference on "General", "Physical health", "Psychological" and "Environment" dimensions of WHOQOL-BREF, with the exception of "Social relations" dimension where a statistically significant difference was found between the ED nurses of adult and pediatric hospitals, with the latter scoring a better social relationship.

Studies focused on pediatric nurses, have shown that nurses working with pediatric patients have a low quality of life, with women, however, being more satisfied with their work. [30] Increased satisfaction of female pediatric nurses has previously been reported in the study of Karaca and Acikgoz, (2018). [31] Particular characteristics of pediatric nurses, such as extroversion, tenderness, sociability, self-control and responsibility, seem to be related to the increase of job satisfaction and the ability to cope with the stressful workplace in pediatric hospitals. Our study reflected the diversity of pediatric nurses, with the QoL parameter related to the social relationship dimension being rated higher.

### *Limitations and Recommendations*

The convenience sampling has been considered as the major limitation of our study, as it is not possible to capture a more general picture for the ED nurses internationally. Therefore, the evaluation of the results reflects the selected hospitals participated in the research but not all EDs in Greece. It is highly recommended for future multicenter studies including all hospitals and health centers in Greece. Moreover, we propose the assessment, to the maximum possible extent, of ED nurses' quality of life for a better utilization of human resources in ED by a shift work strategic plan aiming to provide high quality emergency nursing care.

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## **5. Conclusion**

ED is characterized as a demanding and at the same time stressful place that decreases nurses' quality of life. Literature reviews, as well as the findings of this study, show that there are several factors affecting and/or influencing nurses' QoL negatively.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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