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Research Paper
Association of Lifestyle and Quality of Life Among Critical Care Nurses: A Cross-sectional Study

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ABSTRACT

Background: Quality of life is an important concept that is related to working conditions and lifestyle behaviors of a person. Poor quality of life in critical care nurses can reduce the quality of care.

Objectives: The purpose of this study was to investigate the relationship between lifestyle and quality of life in critical care nurses.

Materials & Methods: This multicenter cross-sectional study was conducted on 360 nurses working in critical care units of hospitals affiliated to Iran University of Medical Sciences. Demographic characteristics form, World Health Organization (WHO) quality of life questionnaire (WHOQOL-BREF) and Miller-Smith lifestyle inventory were used to collect data.

Results: The mean age of nurses was 38.65±9.89. In the regression analysis, the lifestyle score has an inverse significant relationship with the score of physical health, psychological health, social relationships and environment subscales (B=-0.166, B=-0.233, B=-0.540, B=-0.067, respectively). An increase in the number of night shifts was associated with a decrease in quality of life (P<0.001). Nurses working in the hemodialysis unit experienced a higher quality of life in the subscales of physical health and environment. Also, the score of quality of life in married nurses was higher in psychological and social relationships subscales compared to single nurses.

Conclusion: The quality of life of nurses is related to their lifestyle behaviors. Therefore, policy makers and nursing managers should consider the necessary strategies to improve the lifestyle of nurses. Determining the work shift of nurses according to their conditions can reduce the adverse effects of the night shift on the quality of life.

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Introduction

Every job has its own health risks and problems [1]. Work-related stress is associated with decreased performance, quality of life, and a variety of health issues including physical, psychological and interpersonal problems [2]. As the main workforce in health care systems [3], nurses experience more chronic stress in the work environment and engage in unhealthy behaviors due to increased medical care demands, which affect all aspects of their personal and professional lives [4]. Critical care nurses experience a high level of stress compared to nurses with other specialties [5, 6].

Stress in critical care units is attributed to several factors including complex clinical environment, complex job demands and job descriptions, increased admissions, unpredictable work schedule, long working hours, time constraints, understaffing, physician-nurse communication, low social support, unreality expectations of patients and their families and the frequent encounter with moral dilemmas and end-of-life issues [2, 5, 7, 8]. The adverse consequences of such a stressful work environvment can include poor well-being of nurses, burnout, challenges to recruit and retain nurses with high competence, and reduce in quality of life [9].

Health-related quality of life is a multidimensional concept that includes various aspects of physical, mental health, social functioning and overall well-being [10]. Over time, with the progress of health and well-being of human societies, attention was shifted from longevity and treatment to subjective issues such as well-being and quality of life [11]. The work conditions of nurses expose them to serious risks, followed by a reduction in the quality of life [12]. The World Health Organization (WHO) defines quality of life as people's understanding of their position in life in the context of the culture and value system in which they live, which is related to the goals, expectations, standards and concerns of the individual [11]. Nurses constantly face high-stress situations that cause physical and emotional fatigue and lead to a decrease in the quality of life [13].The quality of life of nurses directly affects the quality of patient care. Promoting the quality of life of nurses will lead to improving the quality of patient care and the image of medical institutions [14].

Quality of life is closely related to a person's health status. In turn, health status is strongly dependent on lifestyle [12]. Lifestyle refers to the ways that people live according to it and can affect their health [15]. In addition to increasing the life expectancy and job satisfaction of nurses, health promotion reduces the costs of absenteeism due to illness [16]. Nurses should actively practice health promotion behaviors to improve health conditions and quality of patient care. However, working conditions and the nature of shift work schedules can easily lead to unhealthy lifestyle habits in nurses [17]. Nurses tend to have unhealthy lifestyle patterns such as low physical activity [18]. Nurses' knowledge about healthy lifestyle behaviors does not necessarily lead to healthier lifestyle behaviors [19]. In order to be effective health leaders and educators, nurses must comply with a healthy lifestyle both personally and professionally [12].

Previous health promotion studies have focused on nurses' clinical skills to promote patients' health. Personal lifestyle practices and behaviors of nurses have rarely been investigated [20]. Also, in research to date, few studies have evaluated the relationship between quality of life and lifestyle in health care professional groups, especially critical care nurses. The present study was conducted with the aim of determining the relationship between lifestyle and health related quality of life in critical care nurses.

Materials & Methods

Study design and participants

A cross-sectional design was used to conduct the present study. A total of 360 nurses working in critical care units (CCU, ICU and hemodialysis) of teaching hospitals affiliated to Iran University of Medical Sciences were included in the study by random stratified sampling method. Each hospital was considered as a stratum and according to the number of nurses working in the critical care units of each hospital and the calculated sample size, the number of samples related to each hospital and department was determined. The final selection of nurses was done using a simple random sampling method. The inclusion criteria were having at least a bachelor's degree in nursing, having at least one year of work experience in critical care units, and willingness to participate in the study.

Nurses were excluded from the study if they had mental disorders, experienced bereavement, divorce, or severe illness in the past six months. Taking into account the type I error (0.05), the power (0.95) and the standard deviation of the psychological subscale of quality of life of 9.08 [21] and the precision of 0.9, a sufficient sample size of 356 nurses was determined.

Data collection

After obtaining the official permission, the researcher went to the critical care units of the selected hospitals and provided a brief explanation to the nurses about the objectives of the study. In order to obtain maximum participation, the researcher visited the hospital in different shifts. Questionnaires, a written informed consent form, and an empty envelope were distributed among the nurses who were recruited to participate in the study. The nurses were asked to return the envelopes containing the completed questionnaires to the head nurses. After a week, the researcher received the completed questionnaires.

Instruments

A demographic information checklist, Miller and Smith lifestyle inventory and WHO quality of life questionnaire (WHOQO-BREF) were used to collect data.

Checklist of demographic information included age, gender, work experience, education, marital status, economic status, number of night shifts and department.

To measure the health-related quality of life, the self-administered 26-question quality of life questionnaire of the (WHOQO-BREF) was used, which has subscales of physical health (7 items), psychological health (6 items), social relationships (3 items) and environment (8 items). The response of each item is scoring through a 5-point Likert scale ranging from never (1) to always (5). In this scale, the scores of the subscales are presented separately. The sores converted to a scale of zero to 100 and a higher score in each subscale indicates better quality of life. Items 3, 4 and 26 are scored in reverse. The psychometric properties of the questionnaire in Iran have been confirmed by Nejat et al. and the Cronbach's α coefficient was reported >0.7 [22]. Cronbach's α coefficient in the present study was 0.76.

The lifestyle of the nurses was measured using the Miller and Smith lifestyle inventory. This questionnaire has 20 questions with a 5-point Likert scale from always (1) to never (5), with higher scores indicating an unhealthier lifestyle. In terms of lifestyle, people are classified as low vulnerability (score <50), moderate vulnerable (50 to 70), seriously vulnerable (70 to 95), and extremely vulnerable (>95). Fazel et al. (2011) confirmed the validity and reliability of this questionnaire with Cronbach's α of 0.86 [23].

Data analyses

The data were analyzed using the SPSS software, version 26.0. Quantitative variables were described using Mean±SD and categorical variables were described using frequency and percentage. The normal distribution of data was confirmed using Kolmogorov-Smirnov test and histogram. Firstly, to determine the relationship between quality of life subscales and lifestyle scores and demographic variables, univariate analysis was performed with independent sample t-test, ANOVA, and Pearson's correlation; then variables with P<0.2 in univariate analysis were included in multivariate linear regression models [24]. A significance level of P<0.05 was considered for all analyses.

Results

Demographic characteristics of participants

The mean age of the nurses was 38.65±9.89 and the majority (64.7%) were women. The mean work experience of the participants was 14.83±8.37 years. Most of the nurses had a bachelor's degree (93.1%) and were married (61.1%). The demographic characteristics of the participants are presented in Table 1. The mean lifestyle score was 44.06±20.24 and the majority of nurses (65.3%) were in the low vulnerability category in terms of lifestyle behaviors. Only 15% of nurses had seriously vulnerable lifestyle. The lowest mean score of quality of life was observed in the environment subscale (8.32±8.35) and the highest mean score was observed in the social relationship subscale (67.82±26.83) (Table 1).

Quality of life subscales and lifestyle

The univariate association and correlation coefficient of the scores of the quality of life and lifestyle subscales and the demographic variables was showed in Tables 2 and 3.

The psychological subscale score was significantly higher in married nurses compared to unmarried nurses (P<0.041). Nurses working in the hemodialysis ward experienced poor quality of life in the social relationship subscale compared to nurses working in other critical care units (P<0.032) (Table 2). Lifestyle showed a significant negative relationship with all subscales of quality of life. As the lifestyle score decreased, which indicated a healthier lifestyle, the quality of life score increased (P<0.001). A significant negative relationship between the number of night shifts and all subscales of quality of life was shown, which was statistically significant (P<0.01). No statistically significant relationship was found between age and quality of life subscales (P>0.05) (Table 3).

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Table 1. Participants' characteristics, WHOQOL subscales scores and lifestyle score (n=360)

Variables		No. (%)/Mean±SD
Age		38.65±9.89
Gender	Male	127(35.3)
	Female	233(64.7)
Marital status	Single	140(38.9)
	Married	220(61.1)
Education	Bachelor	335(93.1)
	Master	25(6.9)
Economic status	Low	34(9.4)
	Moderate	220(61.1)
	good	106(29.4)
Unit	CCU	130(36.1)
	ICU	123(34.2)
	Hemodialysis	107(29.7)
Number of night shifts (month)		8.14±3.16
Work experience (y)		14.83±8.37
Lifestyle score	Lifestyle score	44.06±20.24
	Low vulnerability (<50)	235(65.3)
	Vulnerable (50 to 70)	71(19.7)
	Seriously vulnerable (70 to 95)	54(15)
WHOQOL subscales score	Physical health	14.54±13.93
	Psychological health	21.13±13.70
	Social relationship	67.82±26.83
	Environment	8.35±8.32

Multivariate analysis for quality of life subscale and lifestyle

According to the results of the multivariate linear regression model, after adjusting the possible confounding variables, the lifestyle score was still inversely related to the score of all subscales of quality of life; As the score of lifestyle increased, the score of the subscales of physical health, psychological health, social relationships and environment decreased (P<0.001 and B=-0.166, B=-0.233, B=-0.540, B=-0.067, respectively). Also, with the increase in the number of night shifts, the score of the subscales of physical health, psychological health, social relationships and environment decreased (P<0.001 and B=-0.878, B=-1.258, B=-2.187, B=-0.560, respectively). A statistically significant relationship was also found between the department type and the quality of life score; so that the nurses working in the hemodialysis ward experienced a higher quality of life in the subscale of physical health (B=5.337, P<0.003) and environment (B=3.081, P<0.005) compared to other critical care wards. Also, the score of the psychological and social

Table 2. Comparison of WHOQOL subscales scores according to participants' characteristics, and lifestyle

Variables		Mean±SD							
		Physical Health	P	Psychological Health	P	Social Relationships	P	Environ-ment	P
Gender [a]	Male	14.87±13.25	0.739	21.58±13.98	0.643	69.68 ±27	0.332	8.48 ±8.46	0.827
	Female	14.36±14.31		20.88±13.57		66.80±26.74		8.28±8.26	
Marital status [a]	Single	14.33±13.23	0.823	19.28±12.99	0.041	64.94±29.10	0.104	8.30± 8.47	0.919
	Married	14.67±14.39		22.31±14.03		69.65±25.18		8.39±8.24	
Education [a]	Bachelor	14.62±13.97	0.679	21.06±13.64	0.744	67.76±26.62	0.871	8.37±8.39	0.884
	Master	13.42±13.61		22.00±14.75		68.66±30.07		8.12±7.43	
Economic status [b]	Low	14.07± 13.76	0.943	24.26±16.45	0.376	69.11±28.39	0.806	8.63±9.32	0.519
	Moderate	14.62±13.82		20.83±13.64		68.29±27.16		7.96±7.87	
	good	14.62±14.24		20.75±12.84		66.43±25.83		9.08±8.89	
Work Unit [b]	CCU	13.73± 13.10	0.251	22.78±13.08	0.227	72.75±26.44	0.032	8.02±8.22	0.114
	ICU	14.69±13.77		20.25±14.74		65.17±26.82		7.52±8.04	
	Hemodialysis	16.12±14.31		20.13±13.10		64.87± 26.69		9.72±8.66	
Lifestyle score [b]	Low vulnerability (<50)	17.06±14.32	0.001	24.92±11.28	0.001	76.41±21.53	0.001	9.24 ±8.68	0.001
	Vulnerable (50 to 70)	12.42±12.60		18.66±15.26		60.32±28.08		8.89±7.48	
	Seriously vulnerable (70 to 95)	9.82±6.34		12.26±7.87		40.27±24.74		6.12±3.81	

CCU: Cardiac care unit, ICU: Intensive care unit.

[a]Independent t-test, [b]One-way ANOVA.

relationships subscale was higher in married nurses compared to single nurses, and this difference was statistically significant (B=3.229, P<0.013 and B=4.885, P<0.049, respectively) (Table 4).

Discussion

The present study provides basic and useful data regarding the quality of life of critical care nurses and its relationship with lifestyle behaviors. The quality of life of critical care nurses is of particular importance and health managers should pay attention to this issue.

In our study, the critical care nurses' quality of life was unfavorable in all subscales except social relationships. The highest quality of life score of nurses was shown in social relationships subscale, which indicates relatively high social support from friends and families. This finding was consistent with other previous studies that showed nurses have high satisfaction with interpersonal communication, social support and sexual satisfaction in their daily lives [21, 25]. Interpersonal communication helps to strengthen the psychological well-being of people at workplace; hence, it seems necessary to develop interpersonal communication skills and positive coping in nurses [26]. A systematic review study showed that the work-life conflict and unhealthy lifestyle can disrupt the social health of nurses. Also, work shifts and long working hours were related to nurses' social health. Compulsory or long working hours lead to job burnout and reduce productivity and increase absenteeism and ultimately reduce the social health of nurses. Therefore, in order to increase the social health of nurses, nursing managers should consider individual and organizational factors affecting social health in their planning and decision-making [27]. Contrary to the results of the present study, Orszulak et al. (2022) reported in their study that the highest mean score of nurses' quality of life was shown in the psychological subscale [12]. The difference between the findings of the present study and other pre-

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Table 3. Pearson's correlation coefficient between WHOQOL subscales, participants characteristics, and lifestyle score

	Variables	1	2	3	4	5	6	7	8
1	Age	-							
2	Number of night shift	0.046	-						
3	Work experience	0.854**	-0.010	-					
4	Lifestyle score	-0.057	0.195**	0.003	-				
5	Physical health	0.065	-0.195**	0.050	-0.273**	-			
6	Psychological health	- 0.064	-0.345**	- 0.065	-0.402**	0.502**	-		
7	Social relationship	0.025	-0.344**	0.003	-0.461**	0.457**	0.812**	-	
8	Environment	-0.033	-0.201**	- 0.029	-0.199**	0.677**	0.591**	0.529**	-

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

vious studies can be explained by the difference in socio-economic status, type of ward, nature of the hospital, and workload of nurses.

In present study, the lowest mean quality of life score was related to the environment subscale. This finding was consistent with previous studies that indicate that nurses were not satisfied with living conditions, financial resources, security and transportation [21, 25]. A healthy and safe work environment is one of the basic human rights that every person should have today [28]. Hospital work environment inevitably affects the health of nurses, so hospitals should strive to create healthier work environments. This can lead to the improvement of the quality of life and general health of nurses [20]. The findings of a previous study showed that a better nursing work environment was associated with a higher professional quality of life of critical care nurses. Therefore, managers can improve the professional quality of life of nurses by improving the work environment [29]. Contrary to the results of the present study, a previous study showed that the lowest mean score of nurses' quality of life was related to the physical subscale [12].

In the current study, healthy lifestyle was related to improvement of quality of life in nurses. Previous studies showed similar results [12, 13, 30]. A review study showed that many nurses do not follow a healthy lifestyle and these unhealthy lifestyle behaviors are related to an increased risk of cardiovascular disease and a decrease in health-related quality of life [20]. In another study, regular daily routine and good sleep quality were considered as protective factors for quality of life. While smoking and not eating breakfast were related to poor

quality of life [10]. Although nurses are aware of the importance of a healthy lifestyle, this knowledge is not always used for their self-care. In order to be effective health leaders and educators, nurses should consider a healthy lifestyle both personally and professionally [12]. In the literature, key strategies have been proposed to improve the health and quality of life of nurses, which included prioritizing the development of emotional intelligence skills with continuous workshops or individual sessions of psychological counseling, modifying work shifts appropriate to the individual needs of nurses, considering vacation periods to ensure adequate rest and physical and mental recovery, paying attention to eating habits focusing on the quality of hospital meals, subsidizing healthy food and exercise and increasing the number of nursing workforce [13, 16].

In the current study, nurses working in the hemodialysis ward experienced a better quality of life in the subscales of physical health and environment compared to the ICU and CCU wards. The type of ward is a main element in the quality of life of clinical nurses [31]. In critical care units, the working conditions of nurses are usually different compared to other wards. Nurses in these wards mostly face critical patients who need intensive nursing care. Also, management styles, interpersonal communication, workload, and the workplace climate are different from other departments, which can all affect the quality of life of nurses in these wards [8]. The findings of previous studies showed that the work environment was evaluated positively and healthy by the nurses of the hemodialysis ward, which can lead to a better quality of life [32, 33]. Previous studies showed that the workload of nurses working in ICU and CCU wards

Table 4. Adjusted multiple linear regression model for WHOQOL subscales according to lifestyle score and individual variables

Variables		Physical Health			Psychological Health			Social Relationships			Environment		
		B	95 % CI	P	B	95 % CI	P	B	95 % CI	P	B	95 % CI	P
Marital status	Single	-	-	-	Ref	-	-	Ref	-	-	-	-	-
	Married	-	-	-	3.229	0.67, 5.78	0.013	4.885	0.02, 9.75	0.049	-	-	-
Work unit	CCU	Ref	-	-	Ref	-	-	Ref	-	-	Ref	-	-
	ICU	3.666	0.30, 7.03	0.033	0.633	-2.43, 3.69	0.685	-1.769	-7.61, 4.07	0.552	0.694	-1.34, 2.73	0.504
	Hemodialysis	5.337	1.80, 8.87	0.003	0.643	-2.57, 3.85	0.694	-1.896	-8.02, 4.23	0.543	3.081	0.93, 5.22	0.005
Number of night shifts		-0.878	-1.34, -0.41	0.001	-1.258	-1.68, -0.83	0.001	-2.187	-2.99, -1.38	0.001	-0.560	-0.831, -0.26	0.001
Lifestyle score		-0.166	-0.23, -0.09	0.001	-0.233	-0.29, -0.17	0.001	-0.540	-0.65, -0.42	0.001	-0.067	-0.10, -0.02	0.002
Adjusted R-square		0.10			0.239			0.279			0.079		

CCU: Cardiac care unit, ICU: Intensive care unit, CI: Confidence interval.

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is significantly higher compared to nurses working in other ward, which can lead to a poor quality of life [34-36]. The better quality of life of nurses in hemodialysis wards compared to CCU and ICU can be attributed to the type of work shift. The nurses working in the hemo-dialysis wards in our study worked only in the morning and evening shifts, and the ward was only active in the night shift during emergencies. While in the other two departments, nurses worked in rotation in all three shifts.

Our study showed that as the number of night shifts increases, the quality of life decreased in all subscales. Shift work refers to scheduled working hours outside the classic hours of the day, such as night shift [37]. The na-ture of the nursing profession affects a healthy lifestyle. Usually, due to nurse shortage and insufficient income, nurses are forced to work more hours and shifts. High work shifts, especially the night shift, affect nurses' sleep, rest and vitality [38, 39]. Shift work disrupts the circadian rhythm due to the continuous change of the sleep-wake cycle. Nocturnal sleep disorder is associated with fatigue during the day, passive behavior and in-ability to perform simple nursing tasks [17]. A previous study showed that shift work can lead to increased job stress in nurses [40]. On the other hand, higher job stress in nurses with shift work leads to lower participation in health promotion behavior [17]. Previous studies stated that there is a positive relationship between shift work, eating habits, physical activity and nicotine dependence in nurses [13, 37]. Park et al. (2023) in a study on clinical nurses in South Korea showed that shift work is an im-portant factor that can cause sleep disorders and disrupt sleep quality. Therefore, it is necessary to consider the health status and age of nurses when deciding on work shifts [14]. Also, another study showed that nurses with shift work experience more mental and physical work-load and less social support from colleagues and man-agers. Working in the night shift causes disruption in family and social functioning and negatively affects the quality of life [41].

A noteworthy finding in our study was that the mean score of quality of life in the psychological and social relationships subscales were higher in married nurses than in single ones. Marital status is associated with access to social support. The low level of social support in single people disrupts mental health and quality of life [42]. Social support and sense of belonging are important predictors of quality of life. Social support is considered a protective factor against workplace stress and helps nurses adapt to physical and mental work-load, which will lead to nurses' psychological well-being. Therefore, enhancing social support in an active environment improves the quality of life [43, 44]. Contrary to the findings

of the present study, Alareed et al. (2023) reported in their study that the quality of life of single nurses was higher in the subscale of social health compared to married nurses. This finding can be caused by the additional duties of the family by the wife and children, which imposes an additional burden on the social health of married nurses. Because women are responsible for taking care of their children as well as house-keeping and other family activities [25]. In another study, no significant relationship was found between marital status and quality of life of nurses [14].

Conclusion

The critical care nurses' quality of life is a very impor-tant issue. In current study, it was found that the qual-ity of life of nurses is related to their lifestyle behaviors. Policy makers and nursing managers should pay atten-tion to this issue and consider the necessary strategies to improve the lifestyle of nurses. Interventions to improve work environment, training and lifestyle monitoring for nurses and including healthy lifestyle recommendations in the nursing curriculum can be effective in improving the quality of life of critical care nurses. It is recommend-ed to conduct a qualitative study in the future to evaluate the barriers and facilitators of healthy lifestyle behaviors in critical care nurses. Also, considering realistic plans and policies to maintain a healthy work environment, modifying nurses' work shifts according to their physi-cal and mental conditions can reduce the negative effects of night work on nurses' quality of life.

Strengths and limitations

The present study is one of the few studies that focuses on the quality of life of critical care nurses and their life-style behaviors. Recruiting nurses from several hospitals and using standard questionnaires are the strengths of the study. Despite the important findings, our study has limi-tations that should be noted. The use of cross-sectional design, data collection by self-report instruments limits the generalizability of the findings.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Commit-tee of Qazvin University of Medical Sciences (Code: IR.QUMS.REC.1395.37). In all stages of the study, the researchers adhered to the principles of ethics in research such as obtaining written informed consent, maintaining anonymity and confidentiality, and the autonomy of the participants.

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