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Research Article

Stress Is Associated with Quality of Life Reduction among Health Professionals in Vietnam: A Multisite Survey

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Stress in healthcare workers is increasingly common in recent times. Stress can have negative effects on the mental health and quality of life of healthcare workers. This study is aimed at measuring the quality of life and determining the relationship between quality of life and stress of health professionals in some hospitals in Vietnam. A cross-sectional descriptive study was conducted on 520 health professionals working at Hanoi Medical University Hospital and Thai Binh Medical University Hospital. The World Health Organization Quality-of-Life Scale (WHOQOL-BREF) and the Depression, Anxiety, and Stress Scale-21 Items (DASS-21) scale were used to assess the quality of life and the stress status of healthcare workers. Multivariate regression was performed to measure the relationships between stress and quality of life. Results showed that the level of stress of health workers according to the DASS-21 scale at mild, moderate, severe, and very severe was 10.7%, 8.7%, 5.6%, and 2.9%, respectively. The mean score of overall quality of life was 60.97 ± 11.39. Health workers under stress had a decrease in quality of life scores in physical, mental, social, and environmental domains. Stressed health workers had a reduced quality of life. Attention should be paid to providing appropriate interventions to reduce stress and improve the quality of life in healthcare workers.

1. Introduction

Along with socioeconomic development, people's healthcare needs are also increasing, requiring the health sector to improve both in quantity and quality, leading to the growing work pressure on health professionals. In addition, health professionals working in the hospital have to race against the schedule, fight for the patient's life, and shoulder the family chores. With such great pressures, the proportion of health professionals stressed with work is increasing [1, 2]. In the United Kingdom, the medical and healthcare industry is one of the groups of industries with a high rate of occupational stress, equivalent to the group of administration, politics, and education sectors with a lower rate of occupational stress [3]. Prior research on the stress and burnout of staff working in the emergency department in a French University hospital showed that 19.3% of staff suffered from burnout and 27.1% were stressed at work [4]. In Vietnam, the healthcare system has been gradually improving in recent years; however, the overall capacity and medical resources in Vietnam are still limited, causing overcrowding in many hospitals and medical centres [5]. Some studies have also shown that the shortage of human resources in the health sector increases work pressure for health workers and is also one of the causes of stress in medical professionals [6, 7]. Prolonged stress can negatively affect not only the health and psychological well-being of healthcare workers but also patient outcomes, as stress can cause burnout and recurrent episodes of depression among healthcare workers [8, 9]. As defined by the World Health Organization (WHO), "Quality of life is an individual's perception of their place in life based on the culture and value systems in which they live, with their goals, aspirations, standards and concerns" [10]. In other words, quality of life measures complete satisfaction with the physical, mental, and social environment. In addition, the quality of life of healthcare workers is

considered very important because it has an impact on individuals such as the ability to cope with stress [11]. Prior research by Sarafis et al. also showed that occupational stress had a negative impact on the quality of life of nurses [12]. In Vietnam, most of the studies on quality of life have been conducted on patients, and few studies have been conducted on health workers. Health professionals working at university hospitals are both service providers for patients and participants in the management, training, and teaching of the future medical team. Furthermore, healthcare workers serve patients better when they are physically and mentally healthy and have a good quality of life. There are many studies on the stress status of healthcare workers, ranging from 6.4% to 18.5% [13, 14], but there are few studies investigating the relationship between stress and quality of life [15]. Moreover, this study only used a simple instrument to measure the quality of life, which might not fully reflect the concept of quality of life that WHO mentioned above [15]. Therefore, this study was conducted to measure the quality of life of health professionals at some medical university hospitals in Vietnam and determine the relationship between the quality of life and work stress of health professionals. The research results would contribute to finding appropriate stress prevention strategies and improving the quality of life for health professionals.

2. Materials and Methods

A cross-sectional descriptive study was carried out on the participants who were doctors, nurses/midwives, and technicians working at Thai Binh Medical University Hospital and Hanoi Medical University Hospitals. Criteria for the selection of participants were as follows: doctors, nurses, and technicians working at two hospitals of Thai Binh and Hanoi Medical University and working in clinical and subclinical departments who voluntarily consented to participate in the research. Criteria for exclusion of research subjects were as follows: (1) doctors, nurses, and technicians did not cooperate in data collection; (2) those who were suffering from chronic diseases that significantly affected their quality of life or were at risk of psychosis, or sick people requiring inpatient treatment; (3) those who were absent during the study period; and (4) women who were pregnant or lactating. The data collection period was from June 2021 to December 2021 at Thai Binh Medical University Hospital and Hanoi Medical University Hospital. The sample size for the study was calculated using the one-proportion estimation formula, as follows: $n = Z^2_{(1-\alpha/2)} {}^{*} [p^*(1-p)/d^2]$, where n was the sample size for the study; $Z_{1-\alpha/2}$ was the confidence coefficient that depended on the probability threshold $\propto$ (with $\propto = 0.05$, then $Z = 1.96$); p was an estimate of the proportion of healthcare workers with signs of stress, estimated from a study in Vietnam showing that 19% of healthcare workers suffer from stress [16]; and d is the absolute error; in this study, $d = 5\%$. Collectively, the sample size was determined to be 237 healthcare workers. To eliminate the possibility of sample loss during the investigation, we increased the sample size by 10%. Therefore, the number of enumerators was 260 health professionals per hospital. The total sample size to be surveyed for the two hospitals was 520 health professionals. Practically, the actual sample size of this study was 560 health professionals in two hospitals (more than 40 health professionals as required) due to the voluntary participation of the health professionals after knowing the purpose of this study. From the list of health professionals working at the two hospitals of Thai Binh and Hanoi Medical University, after making a list of doctors, nurses, and technicians by faculties, the research team randomly selected a number of employees participating in the study until the sample size was sufficient.

3. Data Collection

A structured self-administered questionnaire was developed and used for collecting data. First, literature about stress and quality of life among health professionals was reviewed to examine which scales should be used. Then, a questionnaire was developed and piloted. Ten health professionals who met the inclusion criteria were recruited for the pilot study to check the suitability of the logical order of the questions, format, and language. After receiving comments from participants, the final questionnaire was approved by the research team. The self-administered paper-pencil questionnaire consists of 3 parts and takes about 15 minutes to complete. The first part included sociodemographic characteristics and causes of the stress of health workers including workplace, age, gender, marital status, education level, profession, working experience in the hospital, and potential stressors. Questions about potential stressors had 5 domains (workload, 13 items; workplace relationships, 17 items; relationships with patients and patient's family, 6 items; conflict between work and family, 7 items; and occupational hazards, 7 items), and each item has 5 response levels on a Likert scale of 1-5 (from never to almost always). The higher the score means the greater the risk of pressure. Cronbach's alpha for each item related to the response to our study is 0.88, 0.94, 0.88, 0.91, and 0.86, respectively. The second part included the stress questions from the DASS-21 scale. A total of 7 items were used to assess stress (items 1, 6, 8, 11, 12, 14, and 18 in the DASS-21 scale). Corresponding to each item, there were 4 levels of answers on the Likert scale from 0 to 3 from "never" to "almost always." Participants were classified into five groups: normal (0-14 points), mild stress (15-18 points), moderate stress (19-25 points), severe stress (26-33 points), and very severe stress (≥34 points). Then, they were also divided into two groups: "normal" with a range score from 0 to 14 points and "stress" with a score ≥ 14 [17]. The DASS-21 scale had been evaluated for reliability and confirmed to be applicable in Vietnam, without cultural differences [18, 19]. Cronbach's alpha was 0.91.

The third part measured the quality of life of healthcare workers according to the WHOQOL-BREF scale in Vietnamese version, which includes 26 questions divided into 4 areas: physical, mental, social relationships, and environment. This version was validated in previous studies [20]. Based on the WHOQOL-BREF questionnaire, each factor affecting the quality of life received an answer with 5 levels of choice, scored from very bad (=1) to very good (=5). Quality of life score was calculated by the average score of 4 areas of physical, mental, social relationships, and environment; the results were transformed

to a scale of 100 according to the conversion table. The higher score reflected a higher quality of life and vice versa [21]. Cronbach's alpha values for items in the areas of physical, mental, social relationships, and environment were 0.78, 0.79, 0.81, and 0.81, respectively.

4. Statistical Analysis

Data were cleaned and entered using EpiData 3.1 software. Data were analyzed using SPSS 20.0 software. Descriptive statistics were performed to describe the sociodemographic characteristics of the study participants. Quality of life scores across domains were expressed as mean and standard deviation as data of these scores were normally distributed. To compare the difference between variables, the chi-square test and the t-test were used. A p value < 0.05 was considered to be statistically significant. Multivariate linear regression was used to identify factors related to the quality of life of healthcare workers. All observations were independent, and the variance inflation factor analysis showed no collinearity among independent factors.

5. Ethical Consideration

The study ensured all ethical principles in biomedical research and was approved by the Ethics Committee of Hanoi Medical University under Decision No. 400/GCN-HDDDNCYSH-ĐHYHN dated May 19, 2021. The study was conducted voluntarily by health professionals and approved by the Board of Directors of Thai Binh Medical University Hospital and Hanoi Medical University Hospital. Anonymous questionnaires ensure the confidentiality of personal information, and health professionals clearly explained the purpose and significance of the study.

6. Results

Table 1 shows that among 520 health workers participating in the study, the mean age was 34.58 ± 7.43. Females accounted for the highest percentage of 60.0% and 78.7% were married. The average number of years of work experience at the hospital was 9.14 ± 6.22. The proportion of medical doctors, nurses/midwives, and technicians was 46.5%, 40.6%, and 12.9%, respectively. The stress levels of participants according to the DASS-21 scale at mild, moderate, severe, and very severe were 10.7%, 8.7%, 5.6%, and 2.9%, respectively.

According to the respondents, 60.0% of participants almost always suffered from stressors in workplace relationships such as relationships between colleagues and relationships with superiors; 69.2% almost always faced stressors in the overload of work; 72.2% almost always faced stressors in occupational hazards such as working in a high-risk environment, lack of labor protection equipment, susceptible to disease, poorly lit, or noisy workplace; 80.0% almost always faced stressors in relationships with the patient and the patient's family; 83.3% almost always faced stressors in a conflict between work and family when the nature of work did not meet the needs of the family (Table 2).

Table 3 shows that the average overall quality of life score was 60.97 ± 11.39. The highest average score was in the physical domain (63.41 ± 13.87), and the lowest score was in the environmental domain (58.31 ± 11.68).

Table 4 shows that the total score of overall quality of life, physical health, mental health, social relationships, and environment of subjects without signs of stress was higher than that of participants with signs of stress (statistically significant with $p < 0.0001$).

Table 5 shows that gender and qualifications of health workers were not associated with quality of life in any domain. Age, workplace, job stability, and job suitability were significantly associated with a higher quality of life in psychological health. However, stress condition was related to the lower scores of quality of life in physical, psychological, and social relationships and environment (statistically significant with $p < 0.0001$).

7. Discussion

This study indicated a high rate of stress among health professionals, as well as the negative association between stress and their quality of life. Health professionals have to work in an environment with characteristics such as highly dangerous, demanding, time pressure and work deadlines, night duty, work overload, insufficient rest, and with many responsibilities. It is these problems that have created not only a heavy and dangerous working environment but also created psychological stress when working for healthcare workers [22]. Stress in the workplace can affect the physical and mental health of healthcare workers; it limits all activities of healthcare workers as well as negatively affects the health and well-being of healthcare workers [9]. The study showed that the overall stress rate among healthcare workers was 27.9%, in which their stress according to the DASS-21 scale in the levels of mild, moderate, severe, and very severe accounted for 10.7%, 8.7%, 5.6%, and 2.9%, respectively. The research results were similar to the study of Durand et al. at the French University Hospital in 2019 (27.1%) [4]. The rate in this study was lower than in other studies in the USA (the prevalence of stress in nursing was 92%) [23], northwestern Ethiopia (78.4%) [24], eastern Ethiopia (66.2%) [25], and Hong Kong (41.1%) [26]. This difference may be due to differences in the study participants. Our research participants included medical doctors, nurses, and technicians, while other studies focused only on one population such as medical doctors or nurses. Several prior studies also show that nursing subjects had a higher rate of stress than other health professionals [27, 28]. Another explanation may be due to the nature of work or working environment in different studies. Stress among healthcare workers can be caused by many different factors that can be occupational, family, social, or personal factors [2]. Stressors in healthcare workers have often been identified, namely, high responsibility, responsibility for patient's health, and dissatisfaction of patient and patient's family [29]. A prior study on occupational stress of nurses and emergency personnel showed that five factors caused stress in nurses and emergency workers including management, patient care, and personal communication between colleagues or between themselves and the working environment [28]. In

Table 1: Sociodemographic characteristics and stress characteristics according to the DASS-21 stress subscale ($n = 520$).

Characteristics	Frequency (***n***)	Percentage (%)
Age group		
30 years old	161	31.0
31-40 years old	268	51.5
41-50 years old	69	13.3
>50 years old	22	4.2
Mean **age** $(\bar{X}) \pm$ **SD** (min–max)	34.58 ± 7.43 (22-66)	
Gender		
Male	208	40.0
Female	312	60.0
Marital status		
Not married	102	19.6
Married	409	78.7
Divorced, separated	9	1.7
Qualification		
Doctor	242	46.5
Nurses/midwives	211	40.6
Technicians	67	12.9
Hospital work experience		
<5 years	163	31.3
5-10 years	178	34.2
>10 years	179	34.4
Average work **experience** $(\bar{X}) \pm$ **SD** (min–max)	9.14 ± 6.22 (1-40)	
Average income		
Under 3 million VND	23	4.4
3-5 million VND	143	27.5
6-10 million VND	242	46.5
>10 million VND	112	21.5
Average **income** $(\bar{X}) \pm$ **SD** (min–max)	10.04 ± 8.06 (1-70)	
Stress status according to the DASS-21 scale		
Normal	375	72.1
Mild stress	56	10.7
Moderate stress	45	8.7
Severe stress	29	5.6
Very severe stress	15	2.9
Job stability		
Stable	177	34.0
Unstable/relatively stable	343	66.0
Job suitability		
Suitable	311	59.8
Not suitable/relatively suitable	209	40.2
Facing adverse events in the past year		
Yes	70	13.5
No	450	46.5

our study, when the participants were asked about the potential stressors for stress, the results showed that among participants with stress, the potential stressors were workplace relationships such as the relationship between colleagues and relationships with superiors (60.0%), work overload (72.2%), occupational hazards such as working in environments with a high risk of infection (69.2%), lack of labor protection equipment, susceptible to disease, insufficient light and noisy workplace (72.2%), relationships with the patient and the patient's family (80.0%), and conflict between work and family when the nature

Table 2: Stressors in healthcare workers.

Stressors	Never		Rarely		Sometimes		Often		Almost always		p^*
	Normal	Stress	Normal	Stress	Normal	Stress	Normal	Stress	Normal	Stress	
Overload of work	1 (50.0%)	1 (50.0%)	5 (83.3%)	1 (16.7%)	185 (83.7%)	36 (16.3%)	176 (66.4%)	89 (33.6%)	8 (30.8%)	18 (69.2%)	<0.001
Workplace relationship	23 (95.8%)	1 (4.2%)	55 (80.9%)	13 (19.1%)	260 (75.1%)	86 (24.9%)	35 (45.5%)	42 (54.5%)	2 (40.0%)	3 (60.0%)	<0.001
Relationship with the patient and the patient's family	45 (93.8%)	3 (10.0%)	54 (90.0%)	6 (10.0%)	214 (70.9%)	88 (29.1%)	60 (60.0%)	40 (40.0%)	2 (20.0%)	8 (80.0%)	<0.001
The conflict between work and family	58 (87.9%)	8 (12.1%)	35 (92.1%)	3 (7.9%)	213 (77.2%)	63 (22.8%)	68 (50.7%)	66 (49.3%)	1 (16.7%)	5 (83.3%)	<0.001
Occupational hazards	14 (100%)	0	20 (76.9%)	6 (23.1%)	184 (79.0%)	49 (21.0%)	147 (79.0%)	64 (30.3%)	10 (27.8%)	26 (72.2%)	<0.001

*Chi-squared test.

Table 3: Health workers' WHOQOL-BREF quality of life scores by domains.

Domain	Mean ± SD	Min–max
Physical	63.41 ± 13.87	21.4-100
Psychological	62.66 ± 13.41	16.7-100
Social relationship	60.03 ± 14.35	8.3–100
Environment	58.31 ± 11.68	25–96.9
Overall	60.97 ± 11.39	25.0–97.1

Table 4: Stress in healthcare workers by the WHOQOL-BREF quality of life score ($n = 520$).

Domain	Stress status		p^*
	Normal (mean ± SD)	Stress (mean ± SD)	
Physical	65.63 ± 13.66	57.66 ± 12.77	<0.001
Psychological	65.40 ± 12.83	55.57 ± 12.28	<0.001
Social relationship	61.87 ± 14.12	55.29 ± 13.92	<0.001
Environment	60.61 ± 11.56	52.35 ± 9.75	<0.001
Overall	63.30 ± 11.20	54.93 ± 9.52	<0.001

*t-test.

of work did not meet the needs of the family (83.3%). Our study showed that the average overall quality of life score was 60.97 ± 11.39. This result in our study was higher than prior research, which measured quality of life among health professionals and postgraduate medical students [30]. In four domains of the WHOQOL-BREF scale, the highest mean score was in physical health (63.41 ± 13.87), and the lowest score was in environmental health (58.31 ± 11.68). The low average score of the environmental health domain suggested that the satisfaction of the participants in the family environment was not high, and participants did not have much time to participate in recreational activities, less travel at work, fatigue, and poor performance. The highest average score in the study was in physical health, which showed better self-care, mobility, and physical activity levels. It may be due to the characteristics of the participants' working environment, which requires them to be healthy and full of energy to operate. Prior research showed that the highest average score on the WHOQOL-BREF scale is in the physical health domain (68.0 ± 15.7), and the lowest mean score was in the social domain (53.5 ± 23.0) [31]. Another research by Iqbal showed that the quality of life score of healthcare workers in Pakistan according to the WHOQOL-BREF scale was relatively high in all domains, of which the highest score was in the social relationship (70.30 ± 15.90), followed by psychological health domain (68.92 ± 15.53), physical health (65.18 ± 13.01), and environment health (65.10 ± 15.17) [32]. These scores were higher than those in our study, which could be explained by the difference in the time of the survey when these studies were performed before the COVID-19 pandemic. The results of our study also showed that the mean scores of the physical, mental, social, and environmental domains among participants without signs of stress were higher than those of the stressed participants ($p < 0.0001$). When performing linear regression analysis to identify factors affecting the quality of life of health professionals, our research showed that the stress status of health professionals was associated with lower quality of life scores. The results of our study were similar to the study in China, which showed that nurses with occupational stress have a lower quality of life score than nurses without stress ($p < 0.05$) [33]. A study in Korea had similar results when finding that stress was negatively correlated with health-related quality of life among health professionals during COVID-19 [34]. These results were also found in other countries such as Malaysia [35] and Taiwan [36]. Another research demonstrated that long-term occupational stress can lead to a decline in the quality of life of nurses, thereby affecting the work performance of nurses [11]. Our research shows that the gender and qualification of healthcare workers did not affect the quality of life of health workers in any domain. However, age, place of work, job stability, job suitability, and having experienced adverse events in the past year in the nonstressed groups were positively associated with the quality of life of health professionals ($p < 0.05$). Limitations of our study included the cross-sectional design which hinders the ability to draw causal relationships. Moreover, this study was only performed in only two medical university hospitals in Vietnam, which might not represent other hospitals. Our study was

Table 5: Multivariate regression analysis on the relationship between some factors to quality of life in health workers.

Characteristics	Physical β (95% CI) [p value]	Psychological β (95% CI) [p value]	Social relationships β (95% CI) [p value]	Environment β (95% CI) [p value]
Gender	-0.08 (-4.571 to 0.198) [0.072]	-0.03 (-2.941 to 1.323) [0.456]	-0.05 (-3.840 to 1.200) [0.304]	-0.04 (-2.934 to 0.0884) [0.29]
Age	0.05 (-0.080 to 0.261) [0.296]	0.18 (0.180 to 0.485) [<0.001]	0.06 (-0.075 to 0.286) [0.250]	0.08 (-0.010 to 0.264) [0.06]
Qualification	-0.04 (-3.505 to 1.377) [0.392]	-0.04 (-3.152 to 1.213) [0.383]	-0.01 (-2.930 to 2.230) [0.790]	-0.04 (-1.98 to 0.734) [0.367]
Workplace	0.11 (0.566 to 5.572) [0.016]	0.09 (0.152 to 4.628) [0.036]	0.52 (-1.148 to 4.143) [0.267]	0.08 (0.059 to 4.085) [0.04]
Job stability	0.05 (-1.181 to 4.220) [0.269]	0.11 (0.786 to 5.615) [0.009]	0.07 (-0.812 to 4.896) [0.160]	0.12 (0.745 to 5.137) [0.009]
Job suitability	0.04 (-1.543 to 3.615) [0.430]	0.12 (0.879 to 5.491) [0.007]	0.08 (-0.533 to 4.918) [0.115]	0.06 (-0.751 to 3.437) [0.208]
Adverse events in the past year	0.08 (-0.122 to 6.645) [0.059]	0.09 (0.862 to 6.913) [0.012]	0.03 (-2.174 to 4.978) [0.441]	0.11 (1.119 to 6.618) [0.006]
Stress	-2.23 (-9.562 to -4.372) [<0.001]	-0.28 (-10.540 to -5.899) [<0.001]	-0.18 (-8.529 to -3.044) [<0.001]	-0.27 (-9.172 to -4.954) [<0.001]

conducted during the COVID-19 pandemic, which might also be a significant risk factor for reducing the quality of life of healthcare workers. Moreover, we used the DASS-21 stress subscale for measuring levels of stress among health professionals rather than using other specific validated tools. Other factors such as burnout, physical health, economic status, and social support were not included in this study, which should be addressed in further studies.

8. Conclusion

High levels of stress and moderate quality of life were observed among Vietnamese healthcare workers. Stress was also closely related to the quality of life among health professionals. Attention should be paid to providing appropriate interventions to reduce stress and improve the quality of life in healthcare workers.

Data Availability

The datasets generated for this study are available upon request.

Conflicts of Interest

All authors declare no conflict of interest.

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