ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA DOI: 10.5336/nurses.2024-102633

The Effect of Fatigue on Quality of Work Life and Health in Shift-Work Nurses: A Descriptive Study

Vardiyalı Çalışan Hemşirelerde Yorgunluğun İş Yaşam Kalitesi ve Sağlık Üzerine Etkisi: Tanımlayıcı Bir Çalışma

Sevgi TULUPCU[a], Emine ERGİN[b]

[a]Karamanoğlu Mehmetbey University Vocational School of Health Services, Karaman, Türkiye
[b]University of Health Sciences Hamidiye Faculty of Health Sciences, Department of Midwifery, İstanbul, Türkiye

ABSTRACT Objective: This study aims to explore the effects of fatigue on quality of work life and health in shift-work nurses. **Material and Methods:** This is a descriptive study. The data were collected using a self-reported sociodemographic questionnaire, the Piper Fatigue Scale, the Work-Related Quality of Life, and the General Health Questionnaire-12. The data were analyze using the SPSS 25.0 statistical software and evaluated using descriptive analyzes (percentage, frequency, mean and standard deviation) of socio-demographic and work-related characteristics. **Results:** Of the shift-work nurses, 59.4% were severely tired and 83.4% were at risk of depression. Their Work-Related Quality of Life mean score was 51.87±14.74. A statistically significant weak negative correlation was found between their Piper Fatigue Scales, its subscales and Work-Related Quality of Life mean scores. There was a statistically significant moderate positive correlation between their Piper Fatigue Scales, its subscales and General Health Questionnaire-12 mean scores. **Conclusion:** Shift-work nurses have high fatigue and low quality of work life and are at risk for depression. Workload should be decreased to reduce fatigue in nurses. Health policies should be structured to employ a sufficient number of nurses in hospitals

Keywords: Fatigue; general health; nurse; shift; quality of work life

ÖZET Amaç: Bu çalışmanın amacı, vardiyalı çalışan hemşirelerde yorgunluğun iş yaşam kalitesi ve sağlık üzerine etkilerini araştırmaktır. **Gereç ve Yöntemler:** Bu çalışma tanımlayıcı çalışmadır. Veriler, kişinin bildirdiği sosyodemografik anket, Piper Yorgunluk Ölçeği, İşle İlgili Yaşam Kalitesi ve Genel Sağlık Anketi-12 kullanılarak toplanmıştır. Veriler SPSS 25.0 istatistik yazılımı kullanılarak analiz edilmiş ve sosyodemografik ve işle ilgili özelliklerin tanımlayıcı analizleri (yüzde, frekans, ortalama ve standart sapma) kullanılarak değerlendirilmiştir. **Bulgular:** Vardiyalı çalışan hemşirelerin %59,4'ü ileri derecede yorgundu ve %83,4'ü depresyon riski taşıyordu. İşe İlişkin Yaşam Kalitesi puan ortalaması 51,87±14,74 idi. Piper Yorgunluk Ölçeği ve alt ölçekleri ile işe ilişkin yaşam kalitesi puan ortalamaları arasında istatistiksel olarak anlamlı, zayıf, negatif bir korelasyon bulundu. Piper Yorgunluk Ölçeği ve alt ölçekleri ile Genel Sağlık Anketi-12 ortalama puanları arasında istatistiksel olarak anlamlı orta derecede pozitif korelasyon vardı. **Sonuç:** Vardiyalı çalışan hemşireler yüksek yorgunluğa, düşük iş yaşam kalitesine sahiptir ve depresyon riski altındadır. Hemşirelerde yorgunluğun azaltılması için iş yükü azaltılmalıdır. Sağlık politikaları hastanelerde yeterli sayıda hemşirenin istihdam edilmesini sağlayacak şekilde yapılandırılmalıdır.

Anahtar Kelimeler: Yorgunluk; genel sağlık; hemşire; vardiya; iş yaşam kalitesi

Secondary and tertiary healthcare services are provided uninterruptedly in hospitals to prevent patient density and to make healthcare services more efficient and accessible. Therefore, health professionals need to work in shifts.[1] An uninterrupted service is provided by shift-work schedules. Nurses, one of the largest and most important professional groups in the health sector, provide care at all hours of the day to meet the complex needs of patients within the increased workload in the health system.[2] In order for

Correspondence: Sevgi TULUPCU
Karamanoğlu Mehmetbey University Vocational School of Health Services, Karaman, Türkiye
E-mail: sevgitulupcu@kmu.edu.tr

Peer review under responsibility of Turkiye Klinikleri Journal of Nursing Sciences.

Received: 06 Mar 2024 ***Received in revised form:*** 06 Oct 2024 ***Accepted:*** 18 Oct 2024 ***Available online:*** 12 Nov 2024

nurses to provide constant health services and uninterrupted treatment and care, they need to work in shifts in intensive care units, operating rooms, emergency services and different clinical services.[3] People have a biological rhythm, allowing them to be awake during the day and asleep at night.[4] However, shift work disrupts their natural rhythms and negatively affects both their biological rhythms and mental health.[1] Long shifts and night work have negative effects on nurses' health and patient outcomes. Among these negative effects, it is known that nurses' sleep-wake cycle may be disrupted, acute and chronic sleep disorders, fatigue, lack of attention, decreased quality of work life, and this may increase the likelihood of occupational accidents and medical errors.[5,6]

Fatigue is defined as mental or physical exhaustion, preventing daily life activities.[7] Min et al. examined the relationship between nurses' shift-work hours and fatigue levels between 2000 and 2018 and reported that a short interval between two shifts increased fatigue, caused health injuries and decreased patient safety.[8] Another study conducted with a total of 220 nurses in the emergency room in Jordan found a positive correlation between fatigue, stress and aggressive behaviors (physical violence, bullying) and a negative relationship between social support of supervisor, justice and commitment to workplace.[9] Current studies emphasize that shift work affects fatigue at diverse levels.[10-12]

Fatigue and quality of work life affect each other and there is a relationship between these concepts. Studies found an inverse positive relationship between fatigue and quality of work life.[11] Quality of work life is defined as fair management, ability of employees to make work-related decisions, having a safe working environment, expressing work-related satisfaction, and ensuring the highest level of physical and mental well-being of employees.[12]

Fatigue has both physiological and psychological effects on health outcomes. Studies determined a negative relationship between fatigue and mental health.[13] One study has shown that shift-workers have 33% more depressive symptoms than non-shift-workers. The study found no difference in depressive symptoms for shift-work men but determined statistically significantly higher depression levels in shift-work women compared to non-shift-work women.[14]

According to the data of the Organization for Economic Cooperation and Development there is one nurse for 431 patients in Türkiye and one for 55 patients in Norway, where the ideal number is one nurse per 102 patients.[15] Insufficient number of nurses increases their workload and number of shifts, negatively affecting their physical and psychosocial health and posing a risk on patient safety.[16] The fatigue level of nurses, who are members of society, may pose different health risks. In addition, affecting the quality of work life of nurses who are responsible for providing care to the society also affects public health. This study aimed to explore the effects of fatigue on quality of work life and health in shift-work nurses.

Research questions

1. What is the relationship between nurses' fatigue level and socio-demographic and working hours?

2. What is the effect of nurses' fatigue level on their quality of work life?

3. What is the impact of nurses' fatigue level on their general health level?

MATERIAL AND METHODS

STUDY DESIGN

This research is a descriptive study. This study aimed to explore the fatigue among shift-work nurses and to identify the effects of fatigue on their quality of work life and health.

STUDY SETTING

The study was conducted in a public hospital in Samsun, Türkiye. Total number of health workers in the hospital was 1,400 and the number of shift-work nurses was 217. Nurses in the hospital work in morning shift, night shift or extended shift.

Participants

All participants were nurses working in the selected a public hospital between November 2020-April 2021. Shift-work nurses were defined as having any

shift; at least 8 hours or at more 24 hours. The nurses participating in the research had three different working arrangements and worked in different shifts. Working hours of nurses; The first one is 8.00 a.m.-4.00 p.m., the second one is 4.00 p.m.-8.00 a.m. and the third one is 8.00 a.m.-8.00 a.m. Inclusion criteria: being a registered nurse with more than six months of work experience. Nurses working less than 8 hours, being pregnant and having breast-feeding permission were excluded from the study. The sample size of the study was calculated as 146 by using G*Power 3.1.9.2 program and a multiple linear regression with 17 variables, where the effect size d=0.15, margin of error α=0.05, power 1-β=0.90.[17] A total of 187 nurses were recruited in the present study.

Measurements

The research data were collected using a sociodemographic questionnaire form, the Piper Fatigue Scale (PFS), the Work-Related Quality of Life (WRQoL), and the General Health Questionnaire-12 (GHQ-12).

Sociodemographic questionnaire

The sociodemographic questionnaire included demographic information (age, gender, educational status, marital status, income status, chronic disease, smoking) and occupational details (work experience, shift-work year, work unit, work experience in current work unit, number of patients care for per day).[5,6,8,9]

The PFS

In order to evaluate the impact and severity of fatigue on daily living activities, Piper et al. was originally developed scale by.[18] The adaptation of the scale into Turkish was performed by Can et al.[19] It has four dimensions, including behavior/violence (6 items); affect (5 items); sensory (5 items) and cognition/mood (6 items). Total scale score is obtained by dividing total scores of all items by item number, where 0 indicates no fatigue, 1-3 indicates mild fatigue, 4-6 indicates moderate fatigue, and 7-10 indicates severe fatigue. The reliability coefficient (Cronbach's α) of the scale is 0.97.[18] The Turkish version and our research of the scale were respectively a Cronbach's α value of 0.98, and 0.95.[19]

The WRQoL Scale

The scale was developed by Van Laar et al. to evaluate the quality of work life.[20] The adaptation of the scale into Turkish was conducted by Duyan et al.[21] This scale is total 21 item and a Likert type range from 1-5. A higher total score indicates a higher quality of work life. The Turkish version and our research of the scale were respectively a Cronbach's α value of 0.89 and 0.92.[21]

The GHQ-12

The scale was developed by Goldberg and Williams to identify common acute mental disorders in a community.[22] The adaptation of the scale into Turkish was conducted by Kılıç. Total scale score is obtained by adding item scores. The cut-off score for GHQ-12 was calculated as 1/2 as a result of the ROC analysis. A total score of two or more in GHQ-12 indicates the risk of depression. The Turkish version and our research of the scale were respectively a Cronbach's α value of 0.78 and 0.86.[23,24]

DATA COLLECTION

Some nurses filled out the questionnaire online with the link due to busy time, and eligible candidates filled out a face-to-face questionnaire. The questionnaires collected face-to-face were completed by the nurses in the hospital environment in 20-25 minutes.

DATA ANALYSIS

The data were analyze using the SPSS 25.0 (IBM, Armonk, New York, USA) statistical software and evaluated using descriptive analyzes. Descriptive values (socio-demographic and work-related characteristics) is summarized percentage, frequency, mean and standard deviation. The normal distribution was evaluated through skewness and kurtosis values. Normal distribution was accepted when kurtosis and skewness values were between -2 and +2.[25] Fatigue, quality of work and general health status of participation were evaluated with Pearson's correlation analysis. Socio-demographic characteristics and fatigue levels of participation were evaluated chi-square analysis. Chi-square analysis was used to examine the relationship between their socio-demographic characteristics and fatigue levels. A multiple

linear regression analysis was used to analyze the predictive level of PFS subdimension scores on WRQoL and GHQ-12 scores. A p value less than 0.05 was considered statistically significant.

ETHICAL CONSIDERATION

The Institutional Research Ethics Committee of Nursing Faculty affiliated with the Selçuk University approved this study (date: September 7, 2020, no: 26521195-604.02). The research was conducted within the scope of the principles of the Declaration of Helsinki. Permissions were obtained via e-mail for the scales used in the study. Participants whose data were collected online were informed with a voluntary consent form via "Google Forms" (Google, USA) and included in the study after their consent was obtained. Participants whose data were collected face-to-face were informed face-to-face and their consent was obtained.

RESULTS

The mean age of the nurses was 34.10±7.13 years. Their shift-work year was between min=1 and max=30 years. The number of patients they cared for in one shift was between min=1 and max=42. Most of them were women (80.2%), married (63.1%), had a bachelor's degree (72.2%) and had inadequate salary (83.4%). In addition, 15% of them were employed in the emergency room, 14.40% in the internal services, 34.2% in the intensive care unit, 12.3% in the coronavirus disease-2019 (COVID-19) pandemic intensive care unit and 11.8% in the COVID-19 pandemic service. Of the nurses, 40.6% (n=76) were moderately tired and 59.4% (n=111) were severely tired. Considering their responses to the open-ended questions of PFS; 27.8% of the nurses reported excessive workload as the most important reason for their fatigue, 50.2% stated that they slept to reduce their fatigue, and 5.8% stated that they did sports and walking to reduce their fatigue. However, only 8.6% of them reported to have muscle-joint pain.

No statistically significant correlation was found between the nurses' fatigue levels according to gender, status of having children, smoking status, status of working in the COVID-19 unit (p>0.05). A statistically significant difference was found between their fatigue levels by marital status (p<0.05), where 64.4% of the married nurses were severely tired. In addition, 26.2% of the nurses with chronic diseases were moderately tired, while 73.8% were severely tired, this difference was also statistically significant (p<0.05). A statistically significant difference was found between their fatigue levels according to perceived adequacy of salary (p<0.05) (Table 2).

TABLE 1: Average of The PFS, PFS sub-dimension, Quality of Life Scale and GHQ-12.

	X̄±SD	Minimum-maximum
Work-Related Quality of Life	51.87±14.74	21.00-89.00
GHQ-12	5.54±3.61	0.00-12.00
PFS	7.40±1.65	4.02-10.00
PFS subdimensions scores		
PFS behavior/violence subdimension	7.16±1.92	0.00-10.00
PFS affect subdimension	8.13±1.83	1.20-10.00
PFS sensory subdimension	7.28±1.93	1.80-10.00
PFS cognition/mood subdimension	7.15±2.00	2.17-10.00

SD: Standard deviation; PFS: Piper Fatigue Scale; GHQ-12: General Health Questionnaire-12.

Nurses WRQoL scores was relationship of negatively moderate Correlation according PFS, PFS Behavior/violence subdimension and PFS cognition/mood subdimension but low level of negatively relationship PFS affect subdimension and PFS sensory subdimension. Nurses GHQ-12 scores were relationship of positively moderate Correlation according PFS, PFS Behavior/violence subdimension, PFS affect subdimension, PFS sensory subdimension and PFS cognition/mood subdimension (p<0.001) (Table 3).

A multiple linear regression analysis was performed to predict the nurses' PFS subdimensions and WRQoL scores. The model was statistically significant (p<0.001), explaining 16.2% of the variance in the WRQoL score. The PFS behavior/violence (β=-0.243; p=0.022) and cognition/mood subdimensions (β=-0.233; p=0.046) statistically significantly predicted the WRQoL. The PFS affect subdimension (β=-0.003; p=0.976) and sensory sub-dimension (β=0.037; p=0.746) did not predict the WRQoL statistically significantly (Table 4). A multiple linear regression analysis was performed to predict the nurses' PFS subdimensions and GHQ-12 scores. The

TABLE 2: Comparison of fatigue levels in shift-work nurses by socio-demographic variables.

	Moderately tired n (%)	Severely tired n (%)	Total n (%)	Chi-square and p-value
Sex				
Female	57 (38.0)	93 (62.0)	150 (100)	χ^2=1.675
Male	19 (51.4)	18 (48.6)	37 (100)	p=0.196
Marital status				
Married	42 (35.6)	76 (64.4)	118 (100)	χ^2=3.379
Single	34 (49.3)	35 (50.7)	69 (100)	p=0.046*
Having children				
Yes	38 (37.6)	63 (62.4)	101 (100)	χ^2=0.823
No	38 (44.2)	48 (55.8)	86 (100)	p=0.363
Presence of chronic disease				
Yes	11 (26.2)	31 (73.8)	42 (100)	χ^2=3.948
No	65 (44.8)	80 (55.2)	145 (100)	p=0.047*
Smoking				
Yes	26 (38.2)	42 (61.8)	68 (100)	χ^2=0.257
No	50 (42.0)	69 (58.0)	119 (100)	p=0.613
Having adequate salary				
Yes	8 (80.0)	2 (20.0)	10 (100)	χ^2=1.23
Undecided	13 (61.9)	8 (38.1)	21 (100)	p=0.002*
No	55 (35.3)	101 (64.7)	156 (100)	
Working in a COVID-19 unit				
Yes	21 (46.7)	24 (53.3)	45 (100)	χ^2=0.593
No	55 (38.7)	87 (61.3)	142 (100)	p=0.441

TABLE 3: The relationship of PFS and PFS sub-dimension total score with WRQoL Scale and GHQ-12 total score.

	WRQoL scores	GHQ-12 scores
PFS	r=-0.385	r=0.583
	p<0.001*	p<0.001 *
PFS subdimensions scores		
PFS behavior/violence subdimension	r=-0.367	r=0.413
	p<0.001*	p<0.001*
PFS affect subdimension	r=-0.298	r=0.455
	p<0.001*	p<0.001*
PFS sensory subdimension	r=-0.298	r=0.516
	p<0.001*	p<0.001*
PFS cognition/mood subdimension	r=-0.355	r=0.581
	p<0.001*	p<0.001*

PFS: Piper Fatigue Scale; GHQ-12: General Health Questionnaire-12; WRQoL: Work-Related Quality of Life.

model was statistically significant (p<0.001), explaining 36% of the variance in the GHQ-12 score. The PFS cognition/mood subdimensions statistically significantly predicted the GHQ-12 (p<0.001). The PFS behavior/violence (β=-0.016; p=0.863), affect subdimension (β=0.155; p=0.0976) and sensory subdimension (β=0.104; p=0.301) did not predict the GHQ-12 statistically significantly (Table 5).

DISCUSSION

The fatigue level of shift-work nurses is related to their quality of work life and general health status. The fatigue of nurses covers both their individual health and the healthcare systems they are responsible for providing care.[5,7,8] This study found that the nurses had high level of fatigue. Fatigue causes nurses to have deficiencies in patient care and treatment, leading them to make medical errors and stay away from their social environment, and negatively affect their mental health and cognitive functions such as difficulty in concentration and memory impairment.[7,26] High fatigue in nurses negatively affects sleep quality, quality of life, quality of work life, and psychosocial health.[5-8] It is thought that these problems will increase even more if precautions are not taken against the factors affecting the increase in the fatigue level of working nurses. Nurses should learn relaxation techniques, get enough sleep and make

TABLE 4: The effect of nurses' PFS subdimensions scores on WRQoL scores.

	Unstandardized coefficients		Standardized coefficients			
Independent variable	**B**	**SE**	**β**	**t**	**p value**	**95.0% CI**
(Constant)	75.680	4.762		15.893	<0.001*	66.285-85.075
PFS behavior/violence subdimension	-1.866	0.807	-0.243	-2.312	0.022*	-3.458–-0.273
PFS affect subdimension	-0.025	0.851	-0.003	-0.030	0.976	-1.704-1.653
PFS sensory subdimension	0.282	0.870	0.037	0.324	0.746	-1.435-2.00
PFS cognition/mood subdimension	-1.719	0.854	-0.233	-2.012	0.046*	-3.405-0.034

Dependent variable: WRQoL Scale; Durbin-Watson=2.010; F=8.823, p<0.001; R=0.403; R^2=0.162; Adjusted R^2 =14.4%; CI: Confidence interval; SE: Standard error; β: Standardized regression coefficient; PFS: Piper Fatigue Scale; WRQoL: Work-Related Quality of Life.

TABLE 5: The effect of nurses' PFS subdimension scores on GHQ-12 scores.

	Unstandardized coefficients		Standardized coefficients			
Independent variable	**B**	**SE**	**β**	**t**	**p value**	**95.0% CI**
(Constant)	3.517	1.020		-3.448	<0.001*	530-1.504
PFS behavior/violence subdimension	-0.030	0.173	-0.016	-0.173	0.863	-0.371-0.311
PFS affect subdimension	0.305	0.182	0.155	1.675	0.096	-0.054-0.665
PFS sensory subdimension	0.193	0.186	0.104	1.038	0.301	0.174-0.561
PFS cognition/mood subdimension	0.753	0.183	0.417	4.112	<0.001*	-0.392-1.114

Dependent variable: GHQ-12; Durbin-Watson=1.893; F=25.576, p<0.001; R=0.600; R^2=0.360; Adjusted R^2=34.6%; CI: Confidence interval; SE: Standard error; β: Standardized regression coefficient; PFS: Piper Fatigue Scale; GHQ-12: General Health Questionnaire-12.

positive changes in their lifestyle to reduce their level of fatigue.[27] This situation will have significant negative effects on creating a healthy society.

This study determined that the nurses had moderate quality of work life. One study about the quality of work life in prison nurses found their mean quality of work life score as 80.91±14.98, suggesting a moderate quality of work life.[28] Poor quality of work life poses a risk for mental health such as burnout, depression and stress.[29] The new risks of this situation will cause significant negative health consequences for both the nurse and the patient being cared for.[5-7] The present study found that the nurses had lower quality of work life than the average literature have been research.[20,21,28] In addition to the results of this study, Öztürk et al. have found that fatigue negatively affects the quality of work life in healthcare workers.[11] This may be because of high workload in hospitals, insufficient wages, lack of institutional support, long work hours, inability to work in the services they want, and high patient expectations.[30] In addition, in our study, it was found that the PFS behavior/violence subdimension and PFS cognition/mood subdimension were determinants in the quality of work life. Factors affecting the quality of work life; emotional exhaustion, depersonalization, depression anxiety and stress.[31,32] Studies need to be carried out by nurses, managers, and health policy makers to improve especially the quality of work life of nurses who spend most of their time in the hospital.

In this study, 83.4% of the nurses were at risk of depression according to their GHQ-12 scores. One study conducted with healthcare professionals reported that 50% of the participants were nurses and midwives and 41.2% of them were in the risky group in terms of mental health.[33] Studies have shown that nurses are at risk for mental health.[30] Nurses are at risk for depression; This situation affects the quality of business life and the quality of emotional life, but is also accompanied by problems such as anxiety, stress and emotional burnout.[26] It may be that most nurses in this study were recruited during the COVID-19 pandemic because they were at risk of depression. However, there are studies showing that nurses have depression considering their working conditions.[26] For these reasons, it is thought that the factors that cause depression should be examined,

and screening should be performed for early diagnosis and treatment.[29] Fatigue and depression in nurses pose a life-threatening risk for patients and negatively affect the health of nurses.[5-7] Lifestyle changes such as physical activity, smoking cessation, healthy eating, and coping with stressors in shift work can improve mental health.[31]

This study found no significant difference between the nurses' fatigue levels by gender, status of having children, smoking status, and status of working in the pandemic services. Menon and Abraham emphasize that there is no significant relationship between nurses' fatigue levels and age, gender, marital status and chronic diseases.[31] The present study determined that the nurses were more tired as their work experience increased. The reason for the lack of relationship between overtime and fatigue was because overtime payments increased their income and decreased their exposure to financial stressors.

A proper planning and implementation of interventions to reduce fatigue in nurses can reduce their fatigue levels and increase their quality of life. Our study suggests that as the fatigue level of nurses increases, their risk of depression increases. Like our study, a recent study found that both physical and mental fatigue increased in nurses as their depression and stress levels increased.[32] Lifestyle changes such as healthy eating, regular sleep, physical activity and getting rid of unhealthy habits, and gaining the ability to cope with shift-work challenges, reduce fatigue and positively affect physical and mental health.[34,35] Further studies to support mental health in nurses are important to improve nurses' health and patient safety, and also to reduce hospital costs.

LIMITATIONS OF THE STUDY

The data of this study is limited to nurses working in a public institution where the research was conducted. No observations were made, the research is limited to their answers to the survey. It was collected online and face to face due to the COVID-19 pandemic.

CONCLUSION

Insufficient number of nurses results in heavy workload and overtime, causing nurses to feel tired, unable to balance work and social life, and leave their jobs. To improve the quality of work life in nurses; manager nurses, hospital administrators and people involved in health policies should employ a sufficient number of nurses, allow them to work at flexible working hours, and prepare shift and work schedules in line with nurses' expectations.[16]

Considering the importance of nurses in health services, in-service training should be provided with them, their social lives should be supported, and hospital management should respect nurses' work-related opinions, pay attention to their demands, and improve work environments. In addition, workload should be reduced to reduce fatigue in nurses. Health policies should be structured to have a sufficient number of nurses in the wards.

Acknowledgments

We would like to thank all nurses who participated in the study for their valuable contributions.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Sevgi Tulupcu, Emine Ergin;* ***Design:*** *Sevgi Tulupcu, Emine Ergin;* ***Control/Supervision:*** *Emine Ergin;* ***Data Collection and/or Processing:*** *Sevgi Tulupcu;* ***Analysis and/or Interpretation:*** *Sevgi Tulupcu, Emine Ergin;* ***Literature Review:*** *Sevgi Tulupcu, Emine Ergin;* ***Writing the Article:*** *Sevgi Tulupcu, Emine Ergin;* ***Critical Review:*** *Emine Ergin.*

REFERENCES

1. Pulat Demir H, Elkin N, Barut AY, Bayram HM, Averi S. Vardiyalı çalışan sağlık personelinin uyku süresi ve beslenme durumunun değerlendirilmesi [Evaluation of sleep duration and nutrition status of medical staff workers that working shift]. İstanbul Gelişim Üniversitesi Sağlık Bilimleri Dergisi. 2017;2:89-107. https://dergipark.org.tr/tr/download/article-file/338151
2. Pehlivan T, Güner P. Compassion fatigue: what is known, what is unknown. Journal of Psychiatric Nursing. 2018;9(2):129-34. doi: 10.14744/phd.2017.25582
3. Vidotti V, Ribeiro RP, Galdino MJQ, Martins JT. Burnout Syndrome and shift work among the nursing staff. Rev Lat Am Enfermagem. 2018;26:e3022. PMID: 30110099; PMCID: PMC6091368.
4. Yeşilçicek Çalık K, Aktaş S, Kobya Bulut H, Özdaş Anahar E. Vardiyalı ve nöbet sistemi şeklindeki çalışma düzeninin hemşireler üzerine etkisi [The effect of shift working and rotating shifts on nurses]. Journal of Health Science and Profession. 2015;2(1):33-45. doi:10.17681/hsp.31345
5. Karahan A, Abbasoğlu A, Uğurlu Z, Avcı Işık S, Kılıç G, Özhan Elbaş N. Determination of sleep quality, fatigue and attention status of nurses according to the shifts they work and chronotype characteristics. Journal of Psychiatric Nursing. 2020;11(2):98-105. https://jag.journalagent.com/phd/pdfs/PHD-90277-RESEARCH_ARTICLE-AVCI_ISIK[A].pdf
6. Toros E. Uzun çalışma saatlerinin hemşirelerin dikkat, yorgunluk ve uyku kalitesine etkisi [Yüksek lisans tezi]. Edirne: Trakya Üniversitesi; 2020. [Erişim tarihi: 12 Haziran 2024]. Erişim linki: https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp
7. Drake DA, Steege LM. Interpretation of hospital nurse fatigue using latent profile analysis. ANS Adv Nurs Sci. 2016;39(3):E1-E16. PMID: 27490883.
8. Min A, Min H, Hong HC. Work schedule characteristics and fatigue among rotating shift nurses in hospital setting: an integrative review. J Nurs Manag. 2019;27(5):884-95. PMID: 30737987.
9. Ismail KM, Malak MZ, Alamer RM. Psychosocial correlates of work-related fatigue among Jordanian emergency department nurses. Perspect Psychiatr Care. 2019;55(3):486-93. PMID: 30729538.
10. Di Muzio M, Dionisi S, Di Simone E, Cianfrocca C, Di Muzio F, Fabbian F, et al. Can nurses' shift work jeopardize the patient safety? A systematic review. Eur Rev Med Pharmacol Sci. 2019;23(10):4507-19. PMID: 31173328.
11. Öztürk YE, Kıraç R, Kara F. Sağlık çalışanlarında iş yaşam kalitesini etkileyen etmenlerin incelenmesine yönelik bir araştırma [A study on investigation of factors affecting business life quality in health workers]. The Journal of Academic Social Science. 2018;84(6):567-77. doi: 10.16992/asos.14468
12. Lawler E. Strategies for improving the quality of work life. American Psychologist. 1982;37(5):486-93. doi: 10.1037/0003-066X.37.5.486
13. Neufeld KJ, Leoutsakos JS, Yan H, Lin S, Zabinski JS, Dinglas VD, et al. Fatigue symptoms during the first year following ARDS. Chest. 2020;158(3):999-1007. PMID: 32304774; PMCID: PMC7478232.
14. Rosenberg K. Shift work adversely affects mental health. Am J Nurs. 2020;120(3):67. PMID: 32079804.
15. Organization for Economic Cooperation and Development [Internet]. [Cited: June 19, 2022]. "Doctors" (indicator). 2022. Available from: https://www.oecd-ilibrary.org/social-issues-migration-health/doctors/indicator/english_4355e1ec-en
16. Al Zamel LG, Abdullah KL, Chan CM, Piaw CY. Moderating effect of demographic characteristics on the relationship between work life quality and turnover intention: a cross-sectional study. Florence Nightingale J Nurs. 2021;29(2):203-11. PMID: 34263239; PMCID: PMC8245016.
17. Cohen J. Set correlation and contingency tables. Applied Psychological Measurement. 1988;12(4):425-34. https://doi.org/10.1177/014662168801200410
18. Piper BF, Dibble SL, Dodd MJ, Weiss MC, Slaughter RE, Paul SM. The revised Piper Fatigue Scale: psychometric evaluation in women with breast cancer. Oncol Nurs Forum. 1998;25(4):677-84. PMID: 9599351.
19. Can G, Durna Z, Aydiner A. Assessment of fatigue in and care needs of Turkish women with breast cancer. Cancer Nurs. 2004;27(2):153-61. PMID: 15253173.
20. Van Laar D, Edwards JA, Easton S. The Work-Related Quality of Life scale for healthcare workers. J Adv Nurs. 2007;60(3):325-33. PMID: 17908128.
21. Duyan EC, Aytaç S, Akyildiz N, Laar DV. Measuring work related quality of life and affective well-being in Turkey. Mediterranean Journal of Social Sciences. 2013;4(1):105-16. doi: 10.5901/mjss.2013.v4n1p105-
22. Goldberg D, Williams P. A user's guide to the General Health Questionnaire. Windsor, UK: NFER-Nelson; 1988.
23. Kılıç C. Genel sağlık anketi: güvenilirlik ve geçerlilik çalışması [General health questionnaire: reliability and validity study]. Turkish Journal of Psychiatry. 1996;7(1):3-9. https://www.researchgate.net/publication/327344714_GENEL_SAGLIK_ANKETI_GUVENILIRLIK_VE_GECERLILIK_CALISMASI
24. Ozdemir H, Rezaki M. Depresyon Saptanmasinda Genel Sağlik Anketi-12 [General Health Questionnaire-12 for the detection of depression]. Turk Psikiyatri Derg. 2007;18(1):13-21. Turkish. PMID: 17364264.
25. George D, Mallery P. IBM SPSS Statistics 26 Step by Step: A Simple Guide and Reference. 16th ed. New York: Routledge; 2020. p.114. (Verilen sayfa aralığına istinaden bölüm yazarları ve bölüm başlığı eklenmelidir.)
26. Cecere L, de Novellis S, Gravante A, Petrillo G, Pisani L, Terrenato I, et al. Quality of life of critical care nurses and impact on anxiety, depression, stress, burnout and sleep quality: a cross-sectional study. Intensive Crit Care Nurs. 2023;79:103494. PMID: 37556987.
27. İz M, Topaçoğlu H, Dikme Ö, Bayıl E, Layık ME, İz FBA, et al. İstanbuldaki eğitim ve araştırma hastanelerinde çalışan acil tıp asistanlarının Piper Yorgunluk Ölçeği ve Epworth Uykululuk Ölçeği ile yorgunluk ve uykululuk değerlerinin ölçülmesi ve etkileyen faktörlerin değerlendirilmesi [Determination and evaluation of sleeplessness and fatigue and the factors associated with it among emergency medicine residents working at education and research hospitals in Istanbul]. Van Medical Journal. 2019;26(1):91-6. doi: 10.5505/vtd.2019.75010
28. Karaaslan A, Aslan M. The relationship between the quality of work and organizational commitment of prison nurses. J Nurs Res. 2019;27(3):e25. PMID: 30239374; PMCID: PMC6553965.
29. Chen C, Meier ST. Burnout and depression in nurses: a systematic review and meta-analysis. Int J Nurs Stud. 2021;124:104099. Erratum in: Int J Nurs Stud. 2022;127:104180. PMID: 34715576.
30. Güçlü A, Kurşun Ş. Cerrahi kliniklerinde çalışan hemşirelerin iş yaşam kalitesi ve ilişkili faktörler [Quality of work life and related factors of nurses working in surgical clinics]. Florence Nightingale Journal of Nursing. 2018;26(3):187-97. https://fnjn.org/en/quality-of-work-life-and-related-factors-of-nurses-working-in-surgical-clinics-16649
31. Menon SA, Abraham D. A descriptive study to assess the fatigue among nurses working in hospital. Asian J. Nursing Education and Research. 2021;11(1):136-40. doi:10.5958/2349-2996.2021.00035.5
32. Jang HJ, Kim O, Kim S, Kim MS, Choi JA, Kim B, et al. Factors affecting physical and mental fatigue among female hospital nurses: the Korea nurses' health study. Healthcare (Basel). 2021;9(2):201. PMID: 33668525; PMCID: PMC7918797.
33. Çolak M, Erol S. Sağlık çalışanlarının genel sağlık durumu, fiziksel aktivite düzeyleri ve etkileyen faktörler [General health and physical activity levels of healthcare employees and affecting factors]. Journal of Nursology. 2021;24(2):139-47. doi: 10.17049/ataunihem.582280
34. Mokarami H, Rahimi Pordanjani T, Mohammadzadeh Ebrahimi A, Kiani F, Faridan M. Lifestyle and shiftwork: designing and testing a model for health promotion of iranian nurses. J Am Psychiatr Nurses Assoc. 2020;26(3):262-8. PMID: 31747838.
35. Ejebu OZ, Dall'Ora C, Griffiths P. Nurses' experiences and preferences around shift patterns: a scoping review. PLoS One. 2021;16(8):e0256300. Erratum in: PLoS One. 2022;17(6):e0270446. PMID: 34398904; PMCID: PMC8367008.