

Relationship between Night Shift Schedule and Physical, Psychological and Social Wellbeing of Nurses

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Abstract: ***Background:** The night shift is one of the most frequent reason for the disruption of circadian rhythms, causing significant alterations of sleep and biological functions that can affect physical and psychological well-being and negatively impact nurses' work performance. **Objective:** Assess the relationship between night shift schedule and physical, psychological and social wellbeing of nurses. **Research question:** what is the relationship between night shift schedule and physical, psychological and social wellbeing of nurses? **Research design:** descriptive research design was used in this study. **Setting:** the study was conducted in general intensive care of Assuit Main University Hospital, medical and surgical ward at Al-Mansoura Main University Hospital. **Subjects:** A convenient sample of approximately 150 nurses who are involved in providing direct patient care and working night shift schedule in previously mentioned setting. The period of data collection from 30th January 2017 to 30th April 2017. **Results:** the total means score percentage higher in physical and psychological effect of night shift on nurses. **Conclusion:** night shift schedule affect negatively on nurses' physical, psychological, social, financial and ability to continue in their career.*

Keywords: Night shift, Nurses, Intensive care unit, Medical, Surgical unit

1. Introduction

Night shift is considered necessary to ensure continuity of care in hospitals and residential facilities. The night shift is one of the most frequent reasons for the disruption of circadian rhythms, causing significant alterations of sleep and biological functions that can affect physical and psychological well-being and negatively impact work performance⁽¹⁾.

Night shift term defined as work performed after 6pm and before 6am the next day, therefore, the activity at night will be out of phase with the circadian body temperature and other coupled rhythms. In addition, because individual biological rhythms, re-entrain to a time shift at different rates, each time the work schedule rotates, for a period of time after the time shift, the circadian system will be in a desynchronized state. This disorientation can lead health, psychosocial effect such as feeling of fatigue and disorientation⁽²⁾.

Some studies reveal that nurses who work in hospital especially critical care units and care for critically ill patients are more predisposed to stress, while others emphasize that the work overload and interpersonal relationship problems are the most evident stressing factors in the organizational environment of ICU nurses⁽³⁾. Furthermore, few researchers' studies the effect of night shift on critical care nurses for example; Mathew and Campbell (2015) stated that nurse's turnover is expensive. It affects the safety and effectiveness of service in Intensive Care Units and they hypothesized that frequent night duty is a major factor influencing nurses' turnover. They conduct a study on thirty (30) nurses, who choose to leave intensive care unit within last eight month, The results of this study found that 50% of the staff left intensive care unit, because of general

dissatisfaction with a variety of aspects of their job, specifically night duty⁽⁴⁾.

Furthermore, in examining the influence of day, afternoon, night and rotating shifts on job performance and stress on nurses, found that job performances and satisfaction was less on a rotating roster than on a fixed roster. Although there has been a move towards studies of nursing turnover, there is still a general absence of research that attempts to associate perceptions of night duty with job satisfaction and ultimately staff turnover⁽⁵⁾.

Recently, a syndrome called "shift work disorder" has been identified by the presence of the following symptoms: alteration of circadian rhythm of sleep/wake, insomnia, excessive day sleepiness, and fatigue⁽⁴⁾. Night shift work induces sleep deprivation which, in turn, alters the daily levels of alertness and job performance, favoring fatigue⁽⁵⁾.

Fatigue remains the major source of nurses' errors in administering medication and increase the risk of human errors and injuries that can negatively affect the quality of patient care⁽⁶⁾. Moreover, fatigue reduces performance and job satisfaction, favoring absence due to sickness, absenteeism, turnover, and job attrition and often induces use of psychotropic drugs⁽⁷⁾.

Health professionals who worked night shifts showed more psychological and mental health problems than day workers, irritability, somatization, obsessive-compulsive disorder, interpersonal sensitivity, anxiety, altered mood, and paranoid disorders were significantly higher and nursing is considered as a stressful occupation⁽⁸⁾.

The night-shift nurses has rapidly increased worldwide over the last decades and nurses work long-hour night shift have

become under conditions of intense stress. In addition, they often suffer from excessive workloads, stress, minimal social support and low quality of life⁽⁹⁾. Long-term night and shift work in nurses becoming more pessimistic and less vicarious as their training progresses, and might be associated with many health-related problems like fatigue, sleep problems, anxiety and difficulties in maintaining regular lifestyles⁽¹⁰⁾. Therefore the study was conducted to assess the relationship between night shift schedule and physical, psychological and social wellbeing of nurses

Aim of this study to:

Assess the relationship between night shift schedule and physical, psychological and social wellbeing of nurses.

Research questions:

What is the relationship between night shift schedule and physical, psychological and social wellbeing of nurses?

2. Materials and Method

2.1 Materials

Research design:

Descriptive research design was used in this study.

Setting:

The study was conducted in general intensive care of Assuit Main University Hospital and internal medicine and surgical unit at Al-Mansoura Main University Hospital

Subjects:

A convenient sample of approximately 150 nurses who are involved in providing direct patient care and working night shift schedule in previously mentioned setting were included in this study.

Tools of the study

Tool: "Night shift schedule Assessment Questionnaire"

This tool was developed by the researcher after reviewing the related literature⁽⁷⁻¹⁰⁾ and used to assess the effect of night shift on nurses health status. This tool consisted of nineteen questions. These questions focusing on the physically (nine questions), psychologically (four questions), financial (one question), social effects (three questions) and two general questions

- In addition to the nurses' characteristics which included demographic data such as age, sex, marital status and job related data such as nurses' qualification, job title, work place and ICU experience
- The score of each question was assigned as follows yes = one, no = zero

2.2 Method

- Permission to conduct the study was obtained from the hospitals' responsible authority after explanation of the aim of the study.
- Tool "Night shift Schedule Assessment Questionnaire" was developed by the researcher based on reviewing the related literature⁽⁷⁻¹⁰⁾.

- **Content validity** was done for tool by five experts in the fields of critical care and emergency nursing and the necessary modifications were done accordingly.
- **A pilot study** was conducted on fifteen critical care nurses to test the tool for the clarity, objectivity, feasibility, then necessary modifications were carried out and the results were excluded from the study.
- **The reliability** was tested for tool "Night shift schedule Assessment Questionnaire" by using Cronbach's coefficient alpha ($r = 88.6$) which is acceptable.

Data collection

- All critical care and general nurses were given verbal and written, detailed information about the study and were given the opportunity to discuss any issues in need for clarification.
- When the necessary information was given, the participants' nurses were asked to sign a consent form.
- The researcher distributed the questionnaire tool to 150 critical care nurses who are involved in providing direct patient care and working night shift schedule
- An open channel of communication was established between the researcher and nurses to verify any misconception.
- The researcher respects all the participant answers for questions.
- Data was collected by the researcher during approximately three months starting from 30th January 2017 to 30th April 2017.

Statistical analysis:

The raw data were coded and transformed into coding sheets. The results were checked. Then, the data were entered into SPSS system files (SPSS package version 18) using personal computer. Output drafts were checked against the revised coded data for typing and spelling mistakes. Finally, analysis and interpretation of data were conducted.

The following statistical measures were used:

- Descriptive statistics including frequency, distribution, mean, and standard deviation were used to describe different characteristics.

The significance of the result was at the 5% level of significance.

Ethical considerations:

- The researcher explained to the nurses working in ICU, internal medicine and surgical units the objectives of the study orally, additionally to the written explanation on the covering letter of questionnaire.
- Nurses' were assured about the confidentiality of the data collected and the right to refuse to participate in the study.

3. Results

Table (I): presents distribution of nurses' according to their demographic characteristics. In relation to sex, more than two third of nurses (78.0%) were females and half of them (50%) were married. Concerning nurses' age the majority of nurses (82.7%) were in age group from 21 years to less than 30 years old. As regards to name of department, nurses were from medical, surgical and ICU department with the same

percent (33.3%) and In relation to their years of working experience in the health sector, it was found that more than one third (42.7%) of them had less than one year of experience.

The same table revealed that more than two third of nurses (75.3%) were working night shift and satisfied with their work. About one third (41.3%) of them had experience of nursing errors during night shift, in addition to patient care procedure is one of the more difficult procedure to perform during night shift with percent (44.7%).

Table (2): shows distribution of the nurses according to physical effect of night shift. It was found that more than one third of them (43.3%) had back injury from the occupational injuries during night shift and more than two third (79.3%) of nurses had problem to fall asleep after night shift. As regards to nurses' body weight about half of them (50%) reported that the night shift didn't affect their body weight. .

Figure (1):Shows distribution of nurses' physical signs and symptoms during night shift. It was found that less than one third of nurses reported the most common physical signs and symptoms are sleep disturbance and backache (35.3%, 23.3% respectively)

Table (3): describes distribution of the nurses according to psychological effect of night shift. It was found that one third of nurses had stress and two third of them had negative attitude towards nursing (40.7%, 63.3% respectively). Concerning mood changes the majority of nurses (93.3%) night shift affects their mood and more than half of them (55.3%) the night shift increase interpersonal conflict at work.

Table (4): shows distribution of the studied cases according to social effect of night shift. it was found that more than two third of nurses (74.7%) reported that the night shift disturbed their social life and more than half of them (58.7%) complains from interpersonal conflict in their family. In relation to work performance only (7.3%) of nurses who work better at night shift. the same table revealed that more than half of nurses (54.7%) reported the night shift doesn't affect their financial aspect

Table (6): shows the mean score percentage of physical, psychological, social, financial effect of night shift on nurses'. It was found that the total means score percentage higher in physical and psychological effect of night shift on nurses (83.09±9.24, 78.0 ± 22.98 respectively)

Table (7): shows the relationship between physical, psychological effect of night shift and nurses' demographic data. in relation between physical effect of night shift and nurses' demographic data, there were highly statistically significant differences between physical affect and gender , age , experience of nursing errors, working department especially intensive care unit and work satisfaction (p≤0.001, p≤0.002, p≤0.001, p≤0.011, p≤0.021 respectively). Regarding relation between psychological effect of night shift and nurses' demographic data, there were highly statistically significant differences between psychological

affect and marital status, name of department, experience of nursing errors, gender , and age (p≤0.002, (p≤0.001, p≤0.001, p≤0.042, p≤0.005 respectively).

Table (8): presents relationship between social, financial effect of night shift and nurses' demographic data. It was found that highly statistically significant differences between social effect and working department especially intensive care , procedures more difficult for nurses during night shift, age , marital status and experience of nursing errors (p≤0.001, p≤0.001, p≤0.021, p≤0.006, p≤0.034 respectively). Regarding relation between Financial effect of night shift and nurses' demographic data, there were highly statistically significant differences between financial effect and experience of nursing errors, marital status, name of department, years of experience, work satisfaction and procedures more difficult for nurses during night shift (p≤0.001, p≤0.006, p≤0.026, p≤0.005, p≤0.018, p≤0.037 respectively)

Table 1: Distribution of nurses' according to their demographic characteristics

Demographic characteristics	Nurses (N. = 150)	
	No	%
Gender		
Male	33	22.0
Female	117	78.0
Age (years)		
21 – 30	124	82.7
31 – 40	24	16.0
>40	2	1.3
Marital status		
Single	73	48.7
Married	75	50.0
Divorced	2	1.3
Widow	0	0.0
Department in hospital		
Medical department	50	33.3
Surgical department	50	33.3
ICU	50	33.4
Years of experience		
< One	64	42.7
1<5	41	27.3
5<10	33	22.0
>10	12	8.0
Are you satisfied with your work at shift night?		
Satisfied	113	75.3
Dissatisfied	37	24.7
Do you have experience of nursing errors during night shift?		
Yes	62	41.3
No	88	58.7
Which are the following procedures more difficult for you during night shift		
Prepare medication	19	12.7
Nursing notes	28	18.7
Patient care	67	44.7
Handle ICU devices	19	12.7
Other specify	17	11.3

Table 2: Distribution of the nurses' according to physical effect of night shift

Physical affect	Nurses (n=150)	
	No.	%
Have you sustained any of the occupational injuries during night shift?		
Needle- stick injury	32	21.3
Carpal tunnel syndrome	15	10.0
Back injury	65	43.3
Others specify	38	25.3
How many hours do you sleep after night work?		
< 6 hours	87	58.0
6 – 8 hours	52	34.7
> 8 hours	11	7.3
After night shift work do you experience any problem to fall a sleep?		
Yes	119	79.3
No	31	20.7
If you need to induce sleep when on night shift, which of the following use?		
Hot beverages	16	10.7
Alcoholic drinks	1	.7
Sleeping tablets	23	15.3
Listen to music	11	7.3
Reading	62	41.3
Other specify	37	24.7
Dose night shift affects your eating habit?		
Increase	33	22.0
Fast food	31	20.7
Don't eat	35	23.3
Healthy food	32	21.3
Chocolate and chips	19	12.7
Does night shift affect your body weight?		
Increase	24	16.0
Decrease	51	34.0
Not affect	75	50.0
Do you have chronic disease?		
Diabetes mellitus	4	2.7
Hypertension	0	0.0
Cardiac diseases	18	12.0
Musculoskeletal diseases	16	10.7
Other specify	112	74.7
Does the chronic disease affect your in night shift?		
Yes	51	34.0
No	99	66.0

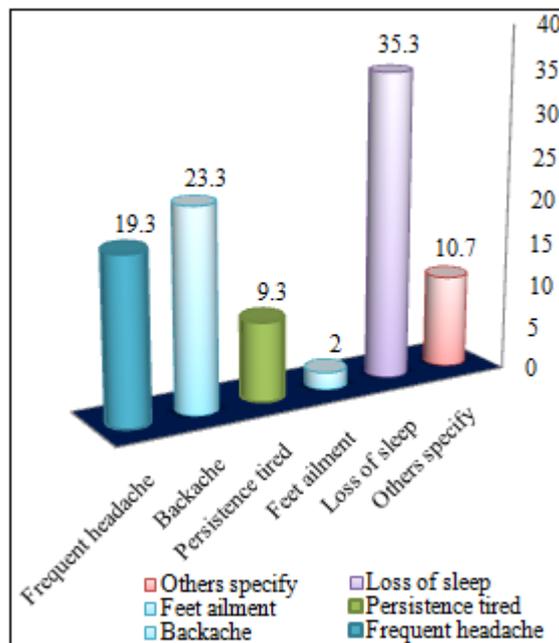


Figure 1: Distribution of the nurses' physical signs and symptoms during night shift

Table 3: Distribution of the nurses according to psychological effect of night shift

Psychological affect	Nurses =150	
	No.	%
The effect at night shift on psychological aspect		
Depression	23	15.3
Aggressive	12	8.0
Anxiety	37	24.7
Stress	61	40.7
Other specify	17	11.3
Dose night shift affects your attitude negatively towards nursing?		
Yes	95	63.3
No	55	36.7
Dose night shift affects your mood?		
Yes	140	93.3
No	10	6.7
Shift increase interpersonal conflict at your work?		
Yes	83	55.3
No	67	44.7

Table 4: Distribution of the nurses according to social and financial effect of night shift

Social affect	No.	%
Dose night shift disturbs your social life?		
Yes	112	74.7
No	38	25.3
Night shift increase interpersonal conflict in your family?		
Yes	88	58.7
No	62	41.3
Work performance better at		
Morning shift	123	82.0
Afternoon shift	16	10.7
Night shift	11	7.3
Financial affect		
Does night shift affect your financial aspect?		
Yes	68	45.3
No	82	54.7

Table 6: The mean score percentage of physical, psychological, social, financial effect of night shift on nurses

Factors	Total mean score	Percentage score
Physical affect	9.14±1.02	83.09±9.24
Psychological affect	3.12 ± 0.92	78.0 ± 22.98
Social affect	2.59± 0.73	51.73±14.69
Financial affect	0.45 ± 0.50	45.33± 49.95

Table 7: Relationship between physical, psychological effect of night shift and nurses' demographic data

Nurses' demographic data	Physical affect	Psychological affect
Gender		
Male	77.69 ± 8.22	84.09 ± 17.48
Female	84.62 ± 8.97	76.28 ± 24.09
t (p)	3.989(<0.001*)	2.071*(0.042*)
Age (years)		
21 – 30	82.11 ± 9.48	80.65 ± 22.51
31 – 40	86.74 ± 5.35	66.67 ± 21.70
>40	100.0 ± 0.0	50.0 ± 0.0
F (p)	6.338*(0.002*)	5.546*(0.005*)
Marital status		
Single	84.06 ± 9.19	83.90 ± 18.34
Married	81.94 ± 9.27	71.67 ± 25.45
Divorced	90.91 ± 0.0	100.0 ± 0.0
Widow	-	-
F (p)	1.714(0.184)	6.645*(0.002*)
Department in hospital		
Medical department	83.24 ± 9.38	79.90 ± 21.41
Surgical department	87.27 ± 9.04	81.25 ± 19.66
ICU	77.92 ± 7.37	60.71 ± 26.89
F (p)	3.815*(0.011*)	5.819*(0.001*)
Years of experience		
< One	81.82 ± 8.42	82.81 ± 18.30
1<5	85.59 ± 8.38	75.61 ± 19.75
5<10	81.82 ± 10.90	74.24 ± 28.97
>10	84.85 ± 10.50	70.83 ± 33.43
F (p)	1.782(0.153)	1.796(0.151)
Are you satisfied with your work in night shift ?		
Satisfied	83.91 ± 9.87	77.65 ± 22.25
Dissatisfied	80.59 ± 6.49	79.05 ± 25.35
t (p)	2.348*(0.021*)	0.321(0.749)
Do you have experience of nursing errors during night shift?		
Yes	86.29 ± 9.48	85.66 ± 20.65
No	80.99 ± 8.46	73.01 ± 23.13
t (p)	3.577*(<0.001*)	3.427*(0.001*)
Which are the following procedures more difficult for you during night shift		
Prepare medication	83.73 ± 10.31	81.58 ± 16.33
Nursing notes	81.49 ± 11.20	83.93 ± 23.78
Patient care	83.18 ± 6.76	78.73 ± 23.94
Handle ICU devices	82.78 ± 11.30	76.32 ± 17.63
Other specify	85.03 ± 11.11	63.24 ± 25.18
F (p)	0.419(0.795)	2.473*(0.047*)

t: Student t-test

F: F for ANOVA test

p: p value for comparing between the different categories

*: Statistically significant at p ≤ 0.05

Table 8: Relationship between social, financial effect of night shift and nurses' demographic data

nurses' demographic Data	Social affect	Financial affect
Gender		
Male	53.94 ± 11.71	42.42 ± 50.19
Female	51.11 ± 15.41	46.15 ± 50.07

t (p)	1.137(0.260)	0.378(0.706)
Age (years)		
21 – 30	53.23 ± 15.28	45.16 ± 49.97
31 – 40	45.0 ± 8.85	41.67 ± 50.36
>40	40.0 ± 0.0	100.0 ± 0.0
F (p)	3.950*(0.021*)	1.268(0.285)
Marital status		
Single	55.34 ± 13.55	56.16 ± 49.96
Married	48.0 ± 15.07	33.33 ± 47.46
Divorced	60.0 ± 0.0	100.0 ± 0.0
Widow	-	-
F (p)	5.223*(0.006*)	5.377*(0.006*)
Department name		
Medical department	53.92 ± 12.20	44.12 ± 49.90
Surgical department	53.0 ± 13.42	40.0 ± 50.26
ICU	37.14 ± 20.28	38.10 ± 49.76
F (p)	9.977*(<0.001*)	3.171*(0.026*)
Years of experience		
< One	49.06 ± 16.69	54.69 ± 50.17
1<5	53.66 ± 14.45	26.83 ± 44.86
5<10	55.76 ± 10.91	39.39 ± 49.62
>10	48.33 ± 10.30	75.0 ± 45.23
F (p)	2.021(0.114)	4.484*(0.005*)
Are you satisfied with your work in intensive care unit?		
Satisfied	52.57 ± 13.41	39.82 ± 49.17
Dissatisfied	49.19 ± 18.01	62.16 ± 49.17
t (p)	1.049(0.299)	2.399*(0.018*)
Do you have experience of nursing errors during night shift?		
Yes	54.75 ± 12.60	78.69 ± 41.29
No	49.77 ± 15.76	22.73 ± 42.15
t (p)	2.139*(0.034*)	8.036*(<0.001*)
Which are the following procedures more difficult for you during night shift		
Prepare medication	51.58 ± 13.85	63.16 ± 49.56
Nursing notes	57.86 ± 9.95	32.14 ± 47.56
Patient care	44.48 ± 15.50	53.73 ± 50.24
Handle ICU devices	63.16 ± 10.03	36.84 ± 49.56
Other specify	57.65 ± 6.64	23.53 ± 43.72
F (p)	11.323*(<0.001*)	2.623*(0.037*)

4. Discussion

Shift work is considered necessary to ensure continuity of care in hospitals and residential facilities. In particular, the night shift is one of the most frequent reasons for the disruption of circadian rhythms, causing significant alterations of sleep and biological functions that can affect physical and psychological well-being and negatively impact work performance. However, this research has been conducted to assess the relationship between night shift schedule and physical, psychological and social wellbeing of nurses.

Effect of night shift on nurses' physical health status Nurse patient care requires a high level of responsibilities and careful attention. Consequently, working conditions should be optimized in order to provide an appropriate quality of care over a 24-hour period. In accordance with the World Health Organization definition of shift work as a risk condition for many health disorders, we suggest that implementing ergonomic criteria aimed at reducing the adverse effects of shift schedules can permit a better

organization of health care. Results of the current study revealed that more than one third of nurses suffering from sleep disturbance and about one quarter of them had backache. Ferri, et al., (2016)⁽¹¹⁾ supported the current study result; they found that the fatigue and sleep alterations have higher rate among nurses on study subject. Goel et al., (2009)⁽¹²⁾ agreed that shift workers commonly complain of gastrointestinal symptoms including abdominal pain, gas, diarrhea, constipation, nausea, vomiting, and change in appetite, indigestion, and heartburn.

As regards to *occupational injuries during night shift the present study indicated that* more than two quarters of nurses have back injury and more than one fifth of them had needle- stick injury. This finding is highly supported with de Castro et al., (2010)⁽¹³⁾; Gershon et al. (2010)⁽¹⁴⁾ they recommended that the study nurses had higher risk for needle stick and other work-related injury, and work-related illness. Concerning *sleep hours after night shift*, the current study revealed that more than half of nurses sleep less than six hours and about most of them had problems to fall in sleep. These findings are in the line with another study conducted by Geiger-Brown et al. (2012)⁽¹⁵⁾, which examined sleep duration in nurses across a series of work shifts and found a mean sleep duration of 5.5 hours between 12-hour shifts.

As regard to *eating habits*. Results of the current study revealed that about one quarter of studied sample don't eat while half of sample their body weight not affected. This finding is highly supported with Lowden A, et al. (2010)⁽¹⁶⁾ who reported that disruption of meal time routines with family and friends, eating alone, and the quality of food and dining facilities. In addition, time for food consumption is seldom prioritized and can be constrained by staffing levels and shift schedules.

The finding of the present study revealed that more than minority of studied sample suffering from cardiac diseases while about three quarters of nurses have other illness but only more than one third of them their illness affected night shift performance. This finding is in accordance with Puttonen, Harma, & Hublin (2010)⁽¹⁷⁾ they reported that epidemiologic data support a link with cardiovascular disease, including myocardial infarction, chest pain, and high blood pressure and Virtanen et al. (2012)⁽¹⁸⁾ they recommended the long work hours increase the risk for coronary artery disease by 40% according to a recent systematic review and meta-analysis.

Effect of night shift on nurses' Psychological health status health professionals who worked night shifts showed more psychological and mental health problems than day workers: irritability, somatization, obsessive-compulsive disorder, interpersonal sensitivity, anxiety, altered mood, and paranoid disorders were significantly higher. These data indicate that shift work has a negative impact on psychological health and social life. Results of the current study found that more than two fifth of nurses had stress, negative attitude towards nursing, and the majority of them have mood changes. This finding is highly supported with (Banakhar M, 2017)⁽¹⁹⁾ they found that shift workers commonly report psychological complaints including bad

mood, depression, irritability, anxiety, personality changes, and difficulty with personal relationships.

Results of the current study revealed that about three quarters of nurses working night shift had disturb their social life and more than half of them increase interpersonal conflict in their family so minority of them work better with acceptable performance during night shift. This finding is in agreement with Susan Ann Vitale et al (2015)⁽²⁰⁾ who found that some participants felt socially isolated and had to work at preserving family life and relationships.

Relationship between effect of night shift and nurses' demographic data

Few papers have addressed the predictive relationship between the demographic variables such as; age, qualifications, work place, years of experience and physical, psychological, social and financial effect. A statistically significant differences between physical, psychological, social and financial effect of night shift and nurses gender, age, experience of nursing errors, department name and work satisfaction.

This finding is in line with the study of Al-Ameri M (2017)⁽²¹⁾ which conducted to find out the impact of night shift on nurses quality of life; and to find out any relationship between the quality of life and some demographic characteristics such as age, gender, marital status, level of education and duration of career and indicated that the married nurses (whether male or female) are more likely to have weaker level of quality of life, this might be due to the difficulties of everyday life events which add more burdens on the nurses in addition to night shift burdens. Those who have ten years of career and less are more likely to have weak and very weak levels of quality of life; this is could be because they have not adjusted very well with nightshift work.

This finding is congruent with the study of Allen C (2016)⁽²²⁾, examined whether nurses can work a 12-hour working system, the results concluded that the system had less significant physical workload but greater mental workload. 78% of nurses whose age less than 30 year, have night shift effect on psychosocial aspect, 56% of them are female and 43% male.

Nursing is considered as a stressful occupation. Stress has an implication for health and the satisfaction level of the Nurses involved which eventually has an impact on the quality of care for the patients they attend to. The night-shift nurses has rapidly increased worldwide over the last decades and nurses work long-hour night shift have become under conditions of intense stress. In addition, they often suffer from excessive workloads, stress, minimal social support and low quality of life.

5. Recommendation

Based on the findings of the present study, the following recommendation can be suggested:

5.1. Nursing education

Encourage the nurses to join the special sessions for coping and stress management to lessen and prevent the work-related stress.

5.2. Nursing administration

- Appropriate health services for night and shift workers, first aid facilities, option to transfer to day work for health reasons.
- There should be workplace policies and procedures that focus on maintaining safety working environment.
- Every shift system should include some free week end with at least 2 successive full days off.
- Considerations of nurses needs for a particular shift and involvement are important for motivation and acceptance of shift schedules and work.

5.3. Nursing research

- Future research should be conducted to identify the best possible practices for decrease the effect of night shift
- Further research also needs to be conducted to assess the effect of night shift on circadian rhythm among nurses working in critical care units

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