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RESEARCH ARTICLE

Association of Fatigue and Sleep Disorders with Work Shift among Nurses working at Teaching Hospitals

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ABSTRACT

Objectives: *The study aims at assessing the work shift pattern as well as fatigue and sleep disorders and to find out the association between them.*

Material and methods: *A descriptive analytical study that is conducted for the period of October 1st 2021 to June 1st, 2022. The sample of the study includes 239 nurses were selected by convenient sampling method (non-probability sample). The setting of the study includes the teaching hospitals in Baghdad city. The questionnaire of the study is employed to fit the current study which consists of two parts; the first part is contained the covering letter and the socio-demographic variables; the second part is concerned with items related fatigue and sleep disorder. The data have been collected through the utilization of the self-administrative report as a mean of data collection. Statistical analyses were conducted by using statistical package for social science (IBM SPSS Statistics) version 26.0.*

Results: *The study found that 55% of nurses are associated with moderate level of fatigue and sleep disorder (38.84±5.798). There is significant association of work shift with fatigue and sleep disorders among nurses evidenced by significant difference at p-value= .038.*

Conclusions: *Based on the study finding, the study concludes that nurses are experiencing moderate effect of work shift consequences regarding fatigue and sleep disorder. The significant impact of work shift is associated with fatigue and sleeps disorder.*

Recommendations: *The study is recommended regular health assessment is required for nurses working in night and evening shift to explore their health status and detection of physical problems related to sleep and eating and so on.*

Keywords: *Fatigue and Sleep disorder, Work Shift, Nurses.*

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INTRODUCTION

Shift work is an inconsistent and atypical work schedule, compared to the typical daytime work schedule, it refers to work schedules outside of usual daytime hours and includes evening, night, morning, rotating, and irregular shift schedules (Wang et al., 2020).

Several studies have demonstrated various adverse effects of unusual working hours, regarding the deleterious effects of shift work on the essential brain functions, most of the studies have investigated its consequences on cognitive functions. However, only a few research studies have investigated the effect of shift work on executive functions (EFs), Executive functions are a set of general-purpose controlling mechanisms associated with the prefrontal lobe, which control the dynamics of human actions and cognition. Core components of EF are cognitive flexibility/shifting, response inhibition, and working memory (Niu et al., 2015).

Work schedules that shift sleep to the day and work to the night will disrupt sleep's circadian and homeostatic control. Such work hours will pose a health risk in terms of sleep and weariness, as well as cardiovascular disease, accidents, and cancer (Knutsson, 2003). The focus will be on sleep and weariness in this section. The terminology for work that occurs outside of normal working hours is fairly hazy, and multiple attempts have been made to classify and organize the various sorts of schedules. Work schedules that divide the 24 hours into roughly equal segments and require three or more teams to provide full 24-hour coverage are sometimes referred to as "shift work." (Knauth, 1996).

Studies shown that psychosomatic illnesses, decreased alertness, increased weariness, changes in mood and motivation, malaise and irritation, lower workplace safety and productivity, and gastrointestinal and musculoskeletal diseases have all been linked to shift work (Monk, 1996). Sleep difficulties, on the other hand, are one of the most common complaints among shift workers (Meijman, 1990). The conflict between circadian rhythms and working irregular hours6 has been blamed for shift workers' poor sleep patterns and alertness. During prolonged periods of shift work circadian rhythms gradually adapt to the new schedule but adaptation is not complete especially when shift work is irregular (Eastman, 1990).

The effects of shift work on sleep behavior have been explored in both natural and laboratory settings for employees of various professions5–8. There are only a few studies in which medical personnel were involved, and the most of these were undertaken in western countries. In Africa, real-life situations differ from those in industrialized countries, with greater disadvantages of shift work and fewer benefits such as higher salary or more time for study (Arnetz, 1990).

In nursing, collated evidence on 12-h shifts and concluded that long shifts are unsafe for both patients, in terms of medication errors and for nurses, who are at greater risk of musculoskeletal diseases, needle stick injuries, and drowsy driving behavior that effect of eight and 12-h shifts on quality of care and health care provider outcomes. They found insufficient evidence to conclude that shift length had an effect on patient or healthcare outcomes (Estabrooks et al., 2009). Therefore, the current study is trying to focus on effects of work shift on nurses' health and how this effect associated with their demographic variables to provide a conceptual framework for the future research.

Objectives of the Study

The study aims at assessing the work shift pattern as well as fatigue and sleep disorders and to find out the association between them.

METHOD

A descriptive analytical study that is conducted for the period of October 1st 2021 to June 1st, 2022; an assessment approach is applied in order to achieve the earlier stated objectives.

The ethical consideration of research is achieved by obtaining the agreement from the Committee of Research Ethics at College of Nursing, University of Baghdad. In addition, the agreements of the participants were asked for participation in research by filling the participation consent in covering letter of the questionnaire.

After getting approved by the College of Nursing Council/the University of Baghdad, the researcher provided a detailed description of the objectives and project of the study to Ministry of Planning, Central Statistical Organization approved the study instrument; Additional permission was got from the Ministry of Health and Environment /Baghdad Health Directorate /Training and Human Development Center/ for having access to teaching hospital at Baghdad city.

The setting of the study was conducted at teaching hospital in Baghdad city which were

selected randomly from Al-Karkh and Al-Rusafa Directorate, these are include: Al-Imamain Al-Kadimain hospital, Al-Karkh General Teaching Hospitals, Baghdad Teaching Hospital, and Al-Imam Ali Teaching Hospital.

Convenience sample "non-probability" sampling method was used to achieve the current study; 249 nurses were selected from hospitals mentioned above on a basis of researcher's convenience.

The questionnaire of the study is employed to fit the current study which consists of two parts; the first part is contained the covering letter and the socio-demographic variables that are: age, gender, marital status, monthly income, nursing qualification, and work shift pattern; the second part is concerned with items related to fatigue and sleep disorder that consisted of 11 items. All items were rated into 5-Likert scale and scored as follows: strongly disagree= 1, disagree=2, neutral=3, agree=4, and strongly agree=5. The overall score of calculated by estimation the range score for total score and rated into three levels as follows: Low: 11 – 25.66, Moderate: 25.67 – 40.33, High: 40.34 – 55. The level of each item is calculated bay estimation the cut off point for mean score and rated into three level as follows: Low= 1 – 2.33, Moderate = 2.34 – 3.67, High = 3.68 – 5.

Relevancy and adequacy of the questionnaire were done by using of panel experts to determine the content validity of the instrument in order to achieve the present objectives of the study.

The internal consistency of the instrument was determined through the pilot study and the computation of Alpha Correlation Coefficient (Cronbach's Alpha). The result of the reliability was (r = 0.70) and such an estimation was statistically adequate which means that the questionnaire had adequate level of internal consistency and equivalence measurability.

The data have been collected through the utilization of the self-administrative report as a mean of data collection. The questionnaire was distributed after being willing to answer the questionnaire and participate in the study.

Statistical analyses were conducted by using statistical package for social science (IBM SPSS Statistics) version 26.0. Data analysis was employed through the application of descriptive and inferential statistical approaches to achieve the objectives of the study.

RESULTS

Table 1: Distribution of Nurses according to their Socio-demographic Characteristics

Characteristics		No	%
Age M±SD= 31.19±8.683	Less than 20 year	2	.8
	20 – less than 30 year	124	49.9
	30 – less than 40 year	79	31.7
	40 – less than 50 year	31	12.4
	50 ≤ year	13	5.2
	Total	***249***	***100***
Gender	Male	115	46.2
	Female	134	53.8
	Total	***249***	***100***
Marital status	Unmarried	49	19.7
	Married	175	70.3
	Divorced	18	7.2
	Widowed / er	4	1.6
	Separated	3	1.2
	Total	***249***	***100***
Monthly income	300000 – 600000 IqD	128	51.4
	601000 – 900000 IqD	73	29.3
	901000 IqD ≤	48	19.3
	Total	***249***	***100***
Nursing qualifications	Secondary school	116	46.6
	Diploma	98	39.4
	Bachelor	24	9.6
	Postgraduate	11	4.4
	Total	***249***	***100***
Work shift	Morning (7 AM – 2 PM)	141	56.6
	Evening (2 PM – 8 PM)	51	20.5

	Night (8 PM – 7 AM)	57	22.9
	Total	***249***	***100***

No: Number, %: Percentage, M: Mean, SD: Standard deviation

This table shows that average age for nurses is 31.19±8.683 years in which 49.9% of them are with age group of 20-less than 30 years. The gender of nurses refers to 53.8% of them are females and 46.2% of them are males. Regarding marital status, 70.3% of nurses are married and 19.7% of them are still unmarried, 7.2% are divorced. The monthly income refers to 300000 to 600000 Iraqi dinars among 51.4% of them. Regarding qualification, 46.6% of nurses are graduated from nursing secondary school and 39.4% of them are graduated with diploma in nursing. The work sift indicates that 56.6% morning shift, 22.9% night shift and 20.5% evening shift.

Table 2: Assessment the Fatigue and Sleep Disorders among Nurses

Levels	No	%	Mean	SD	Assessment.
Low	8	3.2	38.84	5.798	Moderate
Moderate	137	55			
High	104	41.8			
Total	***249***	***100***			

No: Number, %: Percentage SD: Standard Deviation for total score
Low: 11 – 25.66, Moderate: 25.67 – 40.33, High: 40.34 – 55

This table reveals that 55% of nurses are associated with moderate level of fatigue and sleep disorder (38.84±5.798).

Table 3: Mean and Standard Deviation for Items related to Fatigue and Sleep Disorder among Nurses (N=249)

Items	Mean	SD	Assessment
The permanence of shifts causes me general fatigue and fatigue.	3.98	.933	High
I feel constantly drowsy because of my knowledge of the shift system.	3.67	1.042	High
It controls the feeling of insomnia when I sleep.	3.73	1.124	High
I feel like I'm not taking enough rest while I'm learning.	4.01	9.22	High
In my opinion, my average sleep hours are lower than my daily need to sleep.	3.46	1.218	Moderate
The hospital offers a special place to allow nurses to take a break at work	3.38	1.314	Moderate
Take advantage of leisure time at work by taking a break or with a short nap.	3.03	1.341	Moderate
The hospital offers entertainment during the tv, computer, internet and beverage hours.	3.39	1.334	Moderate
I have to have alarm drinks to keep me awake at work, coffee, drinks, and energy.	3.59	1.185	Moderate
I have to take stimulants to keep me awake at work.	3.28	1.412	Moderate
Fatigue is only associated with sleepiness.	3.32	1.260	Moderate

Standard Deviation
Low= 1 – 2.33, Moderate= 2.34 – 3.66, High= 3.67 – 5

This table presents the mean scores and standard deviation for items related to fatigue and sleep disorders; the findings indicate moderate among all items except items 1, 2, 3, and 4 that show high.

Table 4: Predicting Association of Work Shift with Fatigue and Sleep Disorders (N=239)

Work Shift	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Variable	**B**	**Std. Error**	**Beta**		
Fatigue and sleep disorder	.920	.442	.131	2.082	**.038**

a. Dependent Variable: Fatigue and Sleep Disorder

This table reveals that there is significant association of work shift with fatigue and sleep disorders among nurses evidenced by significant difference at p-value= .038.

DISCUSSION

It has seen out of analysis for sociodemographic characteristics of nurses that they are young adult female nurses who were married with previewed moderate monthly income. Interpreting the results obtained for the establishment of a professional profile is always an arduous exercise of approximation and distancing of its constituent elements not always able to be fully, apprehended in a short period of time, for the application of the questionnaire in the data collection. The variable age is an important factor for nurses' activities, since the performance of their daily functions requires a lot of vigor and physical conditioning, which are not infrequently associated with their physical fitness, that is, the capacity to perform activities of the nurse profession. It is possible, therefore, that some behaviors are related to this variable, especially when it comes to resisting and / or overcoming challenges and stress situations. The work sift indicates that more than half of nurses are at morning shift, less than half of them at night shift and evening shift. This finding indicates that nurses are distributed according to the policy of hospital that depends on the available nursing staff. The finding of this study was supported by finding of study that found the nurses are female young and married with approximately moderate level of income (Nunes et al., 2017).

It has known out of findings that more than half of nurses are associated with moderate level of fatigue and sleep disorder (38.84±5.798) as a consequence of work shift impact. The mean scores and standard deviation presented moderate among all items except items 1, 2, 3, and 4 that show high. The nurses show they have high level of fatigue and feel drowsy and also have not enough of rest and sleep hours due to shift rotation. Nowadays, nearly a fifth of the global workforce is engaged in shift work (Ferri et al., 2016; Parent-Thirion et al., 2016). In the healthcare sector, working in shifts ensures the continuity of patient care around the clock. There is mounting evidence that night shift work has a significant impact on health and performance in medical personnel due to the alteration of natural homeostatic and circadian sleep processes (Boivin & Boudreau, 2014; Saghe rianet al., 2017; Ganesan et al., 2017), which can seriously compromise public safety of both patients and medical staff by increasing the risk of errors and workplace accidents (Di Muzio et al., 2019).

It has known out of analysis in table (4-20) that there is significant impact of work shift on fatigue and sleep disorders among nurses evidenced by significant difference at p-value= .038. The findings of current study are come along with finding of literatures that found the significant impact of work shift on nurses' health and particularly physical problems of fatigue and sleep disorders and also psychological problem of stress. [13], [14] & [15]

CONCLUSIONS

Based on the study finding, the study concludes that nurses are experiencing moderate effect of work shift consequences regarding fatigue and sleep disorder. The significant impact of work shift is associated with fatigue and sleeps disorder.

RECOMMENDATIONS

The study is recommended that Ministry of Health should initiate incentives for nurses who are working during night and evening shift to encourage them and decrease their problems, and regular health assessment is required for nurses working in night and evening shift to explore their health status and detection of physical problems related to sleep and eating and so on.

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES

This study was completed following obtaining consent from the University of Baghdad.

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AUTHOR'S CONTRIBUTIONS

Study concept, Writing, Reviewing the final edition by all authors.

DISCLOSURE STATEMENT:

The authors report no conflict of interest.

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