



Impact of Night Shift Work on Sleeping Disorders Among Nurses: A Cross-Sectional Study

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ABSTRACT:

Background: Shift work is typically characterized as an "organization of daily working hours in which different teams work consecutively to cover more or all of the 24-hour period, nurses play a crucial role in in-patient care, with shift nurses being especially vital due to their provision of this period in care. Nurses frequently report sleep issues attributed to non-traditional shifts and extended work hours. Poor sleep quality is linked to diminished cognitive function, suboptimal patient care, and potential threats to patient safety.

Objectives: To identify the impact of night shift work on sleeping disorders among nurse

Methods: A descriptive cross-section study, which is using the evaluation approach, had been conducted in Teaching Hospitals in Baghdad City in order to measure the impact of night shift work on sleeping disorders among nurses. This study is started from 5th January 2024 to 5th April 2024. Convenience sampling (non-probability) included (210) nurses was selected including male and female nurses.

Results: The result indicates that the average The educational level varied among nurses, with the highest percentage being graduates of nursing institutes (Diploma) were (44.29%). Similarly, in terms of years of experience, the highest percentage was among those with less than 5 years of experience at (36.7%). The results of this study demonstrated that 55.24% of nurses are associated with Moderate level of sleep disorder. Meanwhile, the percentage of those nurses associated with Moderate level of occupational information that 48.57%.

Conclusion: This study has concluded that sleep disorders are caused by working night shifts, whether according to a schedule or not. The exploitation of nighttime hours for exhausting and routine work without sleep, even for a

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short period, results in sleep disturbances that may have negative effects on nurses.

Keywords: Night Shift Work, Sleeping Disorders, Impact

1. INTRODUCTION

In the present day, nearly 20% of the global workforce is actively involved in shift work, with around 20% of workers in Europe and America participating in night shifts [1]. Within the healthcare system, shift work is regarded as essential and indispensable to ensure the seamless provision of care in hospitals and residential facilities. The key features of shift work include rotation and scheduling, and nurses find themselves predominantly adhering to schedules that facilitate 24-hour care, encompassing night shifts [2]. Nurses play a crucial role in in-patient care, with shift nurses being especially vital due to their provision of 24-hour care. Shift work disorder among nurses is a significant concern, given its association with adverse patient events [3]. The American Academy of Sleep Medicine categorizes shift work disorder as both a circadian rhythm sleep disorder and a primary sleep disorder. The two most common types of shift work are eight-hour and 12-hour shifts. Shift work disorder may contribute to various adverse health outcomes, including type 2 diabetes[4] coronary artery disease[5], abdominal obesity[6], and breast cancer [7]. Nurses engaged in shift work and extended hours are susceptible to fatigue, impacting job performance, quality of care, and patient safety [8].

Research indicates that sleep disorders, along with mental health issues such as depression and anxiety, are prevalent outcomes of shift work [9]. A large-scale multi-country study encompassing thousands of nurses in Europe and the United States demonstrated that 12-hour shifts have detrimental effects on patient care, nurse health, and overall performance outcomes [10]. Nurses frequently report sleep issues attributed to non-traditional shifts and extended work hours. Poor sleep quality is linked to diminished cognitive function, suboptimal patient care, and potential threats to patient safety [11].

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2. RESEARCH OBJECTIVE:

1. To evaluate the impact of night shift work on sleeping disorders among nurses

2. METHODOLOGY:

3.1. Design

A quantitative research (nonexperimental) cross-section study was conducted during the period of 5th January 2024 to 5th April 2024.

3.2. Study Setting

The study is conducted in Teaching Hospitals in Baghdad city.

3.3. Sample

Convenience sampling (non-probability) included 210 nurses was selected including male and female nurses who worked in night shifts.

3.4. Sampling Size:

The sample size was calculated by using formula conducted by Steven K. Thompson:

$$n = \frac{N \times P \times (1 - P)}{\left[N - 1 \times \left(\frac{d^2}{z^2} \right) \right] + [P \times (1 - P)]}$$

Where:

n = Desired sample size, N = Total population (nurses) = 459, d = 0.05 (margin of error), Z = 1.96 for a 95% confidence interval, P = 0.50 (Probability value)

3.5. Ethical Consideration

Ethical approval has been obtained from the research ethics committee in the College of Nursing at the University of Baghdad, and approval has also been obtained

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through the researcher's distribution of an informed consent sheet to all nurses in order to obtain their permission to participate in the current study. In addition, they were informed that they could refuse to participate in research.

3.6. Study Instrument

Data were collected by a questionnaire which developed for the purpose of the study. The questionnaire consisted (14) items, includes (6) item relative to the demographic data of the nurses who working in night shift which include; age, gender, education level, work shift, the martial status, the number of experience years, (5) items related to occupational information that involve nurses working in night shift and (4) items related to sleeping disorders among nurses who work night shift. This instrument is designed through the use of (5) levels type of Scale the rating and scoring system of the scale is consisted of (5) correct answer out of episodes were rated as strongly agree, (4) correct an out of (5) episode was rated as agree, (3) episode was rated as neutral, (2) episode was rated as disagree and (1) episodes were rated as Strongly Disagree.

3.7. Data Collection

The data on the research variables was obtained through a questionnaire.

3.8. Data Analysis: SPSS (Statistical Package for Social Sciences) version 26.0. is used to analyze the study data.

RESULTS

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

List	Characteristics	f	%
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		Less than 20 year	2	0.95
		20 – less than 30 year	103	49.05
	Age	30 – less than 40 year	54	25.71
1	M±SD= 32,73±10.226	40 – less than 50 year	36	17.14
		50 ≤ year	15	7.15
		<i>Total</i>	<i>210</i>	<i>100</i>
		Male	111	52.86
2	Sex	Female	99	47.14
		<i>Total</i>	<i>210</i>	<i>100</i>
		Nursing high school	64	30.48
		Diploma	93	44.29
3	level education	Bachelor's	50	23.81
		Post graduate	3	1.42
		<i>Total</i>	<i>210</i>	<i>100</i>
		Single	83	39.55
		Married	109	51.9
4	Social status	separated	11	5.2
		Divorced	5	2.4
		Widowed	2	0.95

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		<i>Total</i>	<i>210</i>	<i>100</i>
5	Experience years	less than 5	77	36.7
		5-10 years	56	26.6
		more than 10	77	36.7
		<i>Total</i>	<i>210</i>	<i>100</i>

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation

The table 1 indicated that the average age of nurses is (32.73±10.226) years, with 49.05% of them falling into the age group of 20 to less than 30 years. In terms of gender, (52.86%) of the nurses are male, while (47.14%) are female. The educational level varied among nurses, with the highest percentage being graduates of nursing institutes (Diploma) were (44.29%). Similarly, in terms of years of experience, the highest percentage was among those with less than 5 years of experience at (36.7).

Table 2. - Evaluation of Work Shift Consequences related to occupational information among Nurses(n=210)

Levels	f	%	M	SD	Eva.
Low	51	24.28			
Moderate	102	48.57	15.04	3.813	Moderate
High	57	27.14			
Total	210	100			

f: Frequency, %: Percentage, Eva.: Evaluation, M: Mean for total score, SD: Standard Deviation for total score, Low: 5 – 11.66, Moderate: 11.67– 18.33, High: 18.34 – 25

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Table (2) showed that 48.57% of nurses are associated with Moderate level of occupational information (15.04 ± 3.813).

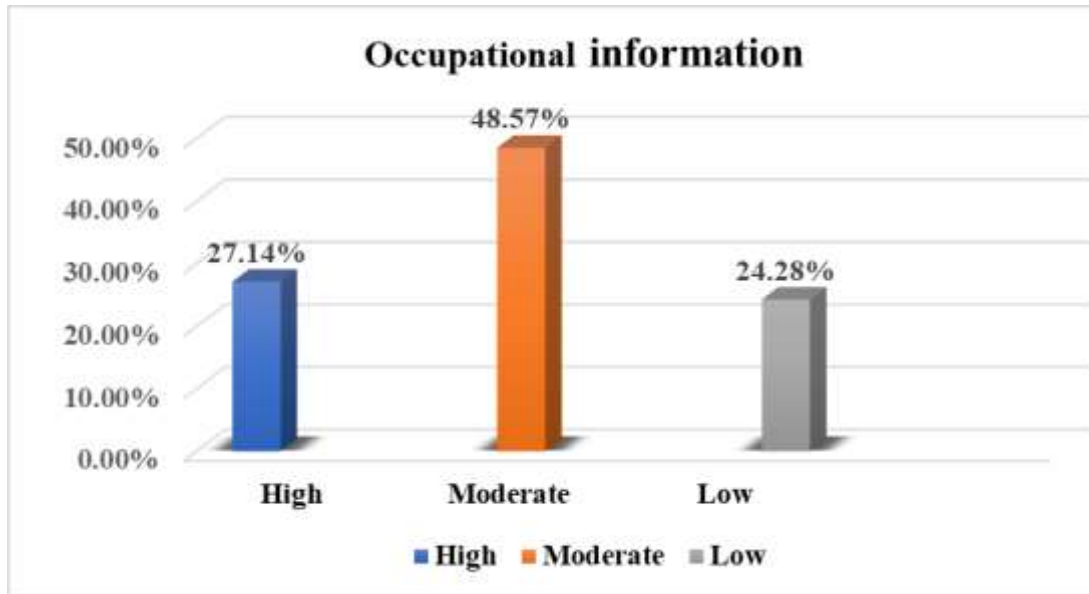


FIGURE 1. - Levels of Impact related Work Shift Consequences among Nurses (N=210)

The figure (1) below shows that 48.57% of nurses are associated with moderate level of impact related to occupational information.

Table 3. - mean and standard deviation for items related to occupational information among nurses (n=210)

No	Items	Mean	SD	Evaluation
1	share in arrange schaduale.	2.46	.424	Moderate
2	prefare work in night shift.	2.40	1.404	Moderate

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3	if answer yes what is the cause?	3.99	.870	High
4	if answer no .what is the cause?	3.21	1.436	Moderate
5	work nature in night shift	2.98	.679	Moderate

No: number, SD: standard deviation, low= 1 – 2.33, moderate= 2.34 – 3.66, high= 3.67 – 5

Table (3) presents the mean scores and standard deviation for items related to occupational information; the findings indicate that items (1, 2) were moderate and (3) was high and (4) was moderate.

Table 4. - Evaluation of Work Shift Consequences related to Sleep Disorder among Nurses(n=210)

Levels	f	%	M	SD	Eva.
Low	62	29.52			
Moderate	116	55.24	9.88	2.484	Moderate
High	32	15.24			
Total	210	100			

f: Frequency, %: Percentage, Eva.: Evaluation, M: Mean for total score, SD: Standard Deviation for total score, Low: 4 – 9.33, Moderate: 9.34– 14.67, High: 14.68 – 20

Table (4) revealed that 55.24% of nurses are associated with Moderate level of sleeping disorder (9.88±2.484).

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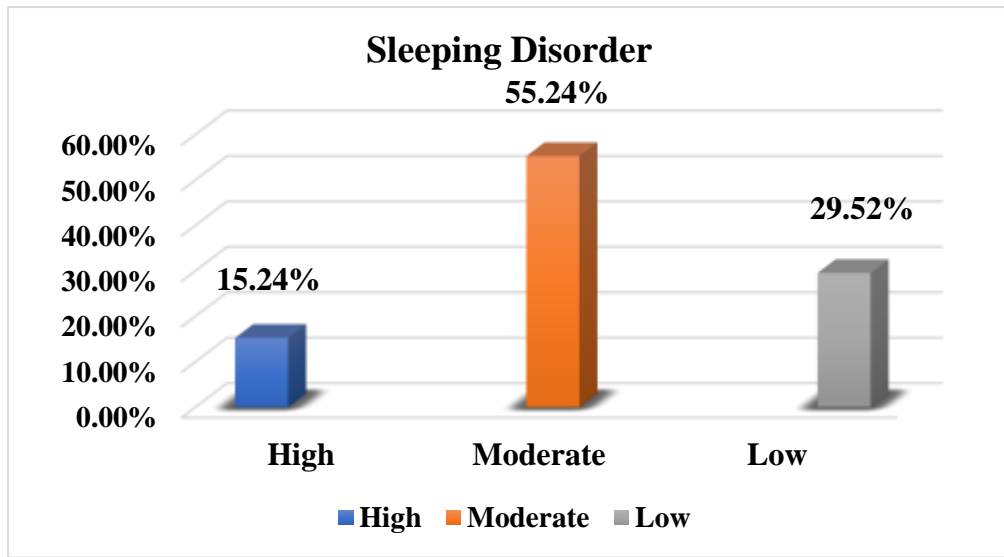


FIGURE 2. - Levels of Work Shift Consequences related to Sleeping Disorder among Nurses (n=210)

This figure (2) demonstrated that 55.24% of nurses are associated with Moderate level of sleep disorder.

Table 5. - Mean and Standard Deviation for Items related to Sleeping Disorders among Nurses (n=210)

No	Items	Mean	SD	Evaluation
1	get enogh time from sleep at night shift.	3.04	1.002	Moderate
2	day sleep hours after night shift.	2.68	1.462	Moderate
3	you have sleep distrbance after night shift.	4.83	.942	High
4	your actions when you feel sleep during night shift.	4.29	1.562	High

No: number, SD: standard deviation, Low= 1 – 2.33, Moderate= 2.34 – 3.66, High= 3.67 – 5

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The table (5) indicated that mean scores and standard deviation for items related to sleeping disorders; the findings indicate that items (1, 2) were moderate and (3, 4) were high.

Discussion

In this study, which relied on demographic information and other relevant data to investigate the impact of night shifts on sleep disturbances among nurses, the results demonstrated in Table 1, the mean age is observed to be 32.73 ± 10.226 , with the highest percentage in the age category of 20-30 years 103 (49.05%). Additionally, related with gender the highest percentage is found in the male category 111 (52.86%). The most frequent educational level is observed in the category of Diploma 93 (44.29%). Also, in social status 83 (39.55%) were single, married 109 (51.9%), separated 11 (5.2%), divorced 5 (2.4%), widowed 2 (0.95%). Those with < 5 years were 77 (36.7%) and > 10 years were 77 (36.7%) of experience are the most common, Concerning the Age variable, studies conducted with other nurse populations have reported data similar to those of this institution: age varying from 35 to 57 years, with a mean age of 38.5 years and a standard deviation of 8.99; this was agreed with this study findings [12].

This study found that more than half of the participants have a secondary or nursing institute education level. Given that the level of awareness and knowledge plays a crucial role in organizing nursing work in general [13]. In related of occupational information the indicated of how many nurses on night shift work as show in Table (2) shows that 48.57% of nurses are associated with Moderate level of occupational information (15.04 ± 3.813), also in figure (1) and so Table (3) presents the mean scores and standard deviation for items related to occupational information; the findings indicate that items (1, 2) were moderate and (3) was high and (4) was moderate. Nunes de Araujo et al said in their study that in Brazilian Nursing, the weekly workload ranges from 30 to 44 hours, with 36 hours a week being the most common, arranged in a schedule [14]. These finding were somewhat similar to this study especially in table 3 item 1 that indicated that moderate level of nurses work in

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an arranged schedules shift and item 3 that indicated that nurses prepare to work night shift with moderate level.

Many studies have shown that working night shifts has a significant and clear impact on increasing sleep disturbances among night shift workers, especially nurses in hospitals. Findings in table 4 revealed that more than half of nurses are associated with moderate level of sleep disorder (9.88 ± 2.484), also figure (2) showed that 55.24% of nurses are associated with Moderate level of sleep disorder as a consequence of work shift impact. The table 5 presented the mean scores and standard deviation for items related to sleep disorders; the findings indicate moderate among 1,2 items and high among 3, 4 items. 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, and this is similar to findings of this study [9]. Also, one of the primary factors related to sleep disturbances due to the impact of night shift work is the psychological and emotional stress experienced by nurses during their shifts. These issues are interconnected because sleep disturbances can lead to psychological and emotional stress and anxiety, while psychological challenges can in turn lead to sleep problems and disturbances among nurses[15-19].

The most prevalent shift schedule involves continuous rotation, including morning, afternoon, and night shifts [20]. Night shifts in healthcare have been linked to significant health and performance issues in medical staff due to disruptions in natural sleep processes [21]. This can pose risks to both patients and staff, leading to errors and workplace accidents [22]. Moreover, psychological empowerment and organizational climate create a balanced environment that makes nurses more prepared to positively deal with the effects of night shift work, including sleep disturbances[23,24]. Despite the level of psychological awareness and motivation among nursing managers, the impact of night shift work on nurses still poses a fundamental psychological and social burden on them [25].

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CONCLUSIONS AND RECOMMENDATIONS

This study has concluded that sleep disorders are caused by working night shifts, whether according to a schedule or not. The exploitation of nighttime hours for exhausting and routine work without sleep, even for a short period, results in sleep disturbances that may have negative effects on nurses. These effects include psychological and physiological disturbances, impact on daily lifestyle patterns, and job performance. Therefore, we recommend paying attention to this highly important phenomenon and increasing awareness and comprehensive knowledge about working night shifts through educational programs and guidance seminars conducted by specialists in this field. Additionally, addressing the problems faced by staff working night shifts, especially economic issues, is crucial.

REFERENCES

- [1] D. B. Boivin and P. Boudreau, "Impacts of shift work on sleep and circadian rhythms," *Pathologie Biologie*, vol. 62, no. 5, pp. 292–301, Oct. 2014, doi: 10.1016/j.patbio.2014.08.001.
- [2] A. Korompeli, O. Muurlink, C. Tzavara, E. Velonakis, C. Lemonidou, and P. Sourtzi, "Influence of Shiftwork on Greek Nursing Personnel," *Saf Health Work*, vol. 5, no. 2, pp. 73–79, Jun. 2014, doi: 10.1016/j.shaw.2014.03.003.
- [3] P. A. Patrician *et al.*, "The Association of Shift-Level Nurse Staffing with Adverse Patient Events," *JONA: The Journal of Nursing Administration*, vol. 41, no. 2, pp. 64–70, Feb. 2011, doi: 10.1097/NNA.0b013e31820594bf.
- [4] T. Anothaisintawee, S. Reutrakul, E. Van Cauter, and A. Thakkinstian, "Sleep disturbances compared to traditional risk factors for diabetes development: Systematic review and meta-analysis," *Sleep Med Rev*, vol. 30, pp. 11–24, Dec. 2016, doi: 10.1016/j.smr.2015.10.002.
- [5] C. Vetter *et al.*, "Association Between Rotating Night Shift Work and Risk of Coronary Heart Disease Among Women," *JAMA*, vol. 315, no. 16, pp. 1726–1734, Apr. 2016, doi: 10.1001/jama.2016.4454.
- [6] M. Sun *et al.*, "Meta-analysis on shift work and risks of specific obesity types," *Obesity reviews*, vol. 19, no. 1, pp. 28–40, 2018.

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- [7] K. Straif *et al.*, “Carcinogenicity of shift-work, painting, and fire-fighting.,” *Lancet Oncol*, vol. 8, no. 12, pp. 1065–6, Dec. 2007, doi: 10.1016/S1470-2045(07)70373-X.
- [8] Q. Sun, X. Ji, W. Zhou, and J. Liu, “Sleep problems in shift nurses: A brief review and recommendations at both individual and institutional levels,” *J Nurs Manag*, vol. 27, no. 1, pp. 10–18, Jan. 2019, doi: 10.1111/jonm.12656.
- [9] Fadhil AL and Faraj R. “Association of Fatigue and Sleep Disorders with Work Shift among Nurses working at Teaching Hospitals,” *Mosul Journal of Nursing*, vol. 10, no. 3, pp. 161–166, Aug. 2022, doi: 10.33899/mjn.2022.175419.
- [10] C. Dall’Ora, J. Sainsbury, and C. Allen, “Student nurses’ views on shift patterns: What do they prefer and why? Results from a Tweetchat,” *Nurs Open*, vol. 9, no. 3, pp. 1785–1793, May 2022, doi: 10.1002/nop2.1208.
- [11] B. M. Veal, C. X. Mu, B. J. Small, and S. Lee, “Subjective cognitive abilities correlate with poor sleep among day-shift and night-shift nurses,” *J Sleep Res*, vol. 30, no. 5, Oct. 2021, doi: 10.1111/jsr.13359.
- [12] S. H. H. Camelo, M. I. Soares, L. D. P. Chaves, F. L. R. Rocha, and V. L. dos S. Silva, “Enfermeiros gerentes de um hospital de ensino: formação profissional, responsabilidades e desafios [Nurse managers at a teaching hospital: training, responsibilities and challenges],” *Revista Enfermagem UERJ*, vol. 24, no. 3, Jun. 2016, doi: 10.12957/reuerj.2016.11637.
- [13] S. Al-Fayyadh, M. B. Al-Jubouri, H. AL-Hadrawi, S. A. Jaafar, and S. M. Hussein, “Health Literacy-Related Knowledge and Experience among Nurses Practicing in Medical-Surgical Wards,” *Nurse Media Journal of Nursing*, vol. 12, no. 1, pp. 24–31, Apr. 2022, doi: 10.14710/nmjn.v12i1.42697.
- [14] M. A. Nunes De Araujo *et al.*, “English/Portuguese J Nurs UFPE on line,” p. 4716, 2017, doi: 10.5205/reuol.11138-99362-1-SM.1111sup201723.
- [15] M. K. Al-Turfi and M. B. Al-Jubouri, “Effect of moral distress on professional quality work among nurses in intensive care units,” *Int J Health Sci (Qassim)*, pp. 8632–8643, Apr. 2022, doi: 10.53730/ijhs.v6nS1.6505.
- [16] Karam SM and Mohammed QQ. Influence of Workplace Incivility on Psychological Well-being of Nurses in the Southern of Iraq. *Iraqi National Journal of Nursing Specialties* [Internet]. 2022 [cited 2024 Apr 14];35(2). Available from: <https://www.iasj.net/iasj/article/259703>
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- [17] Hussein SA, and Obaid AA. "Effectiveness of an Interventional Program on Nurses Practices Toward Post-Operative Intravenous Infusion of Infants with Tracheoesophageal Fistula." *Iraqi National Journal of Nursing Specialties* 36.2 (2023): 92-99.21.
- [18] Abbas HS, and Mohammed QQ. "Association of phantom vibration and ringing syndrome and job-related stress among nurses in Al-Nasiriyah city." *Iraqi National Journal of Nursing Specialties*, vol 31.1 (2018).
- [19] Abdullah LF, and Al-Jubouri MB. "Assessment of Challenges Encountering Nurses in Delivering Care to Patients with Cerebrovascular Accident." *Iraqi National Journal of Nursing Specialties* 36.2 (2023): 80-91.
- [20] S. J. Linton *et al.*, "The effect of the work environment on future sleep disturbances: a systematic review.," *Sleep Med Rev*, vol. 23, pp. 10–9, Oct. 2015, doi: 10.1016/j.smrv.2014.10.010.
- [21] S. Ganesan *et al.*, "The Impact of Shift Work on Sleep, Alertness and Performance in Healthcare Workers," *Sci Rep*, vol. 9, no. 1, p. 4635, Mar. 2019, doi: 10.1038/s41598-019-40914-x.
- [22] M. Di Muzio *et al.*, "Can nurses' shift work jeopardize the patient safety? A systematic review.," *Eur Rev Med Pharmacol Sci*, vol. 23, no. 10, pp. 4507–4519, May 2019, doi: 10.26355/eurrev_201905_17963.
- [23] Kadhim H, and Qassem WJ. "Impact of Physical Work Environment upon Nurses' Job performance in Al-Nassiryah City Hospitals." *Iraqi National Journal of Nursing Specialties* 36.1 (2023): 16-25.
- [24] Ameen K and Hussein H. "Relationship between Organizational Climate and Psychological Empowerment among Nurses at Primary Health Care Centers," *International Journal of Body, Mind and Culture*, vol. 10, no. 3, 2023, doi: 10.22122/ijbmc.v10i3.536.
- [25] Mahdi IS, and Faraj RK. "Evaluation of Self-awareness and Self-motivation among Nurse Managers at Teaching and Non-Teaching Hospitals in Baghdad City." *RES MILITARIS* 12.2 (2022): 6341-6345.