

Work Hazards and Factors contributing to them in relation to Health Problem among staff nurses at Suez Canal University Hospital

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Abstract: Background: Health care workers especially nurses are always exposed to physical, chemical, ergonomic, accidental, psychological and biological hazards that affect their health. Aim of the study: To assess the relationship between work hazards and factors contributing to them and health problem among staff nurses. Research design: A correlational descriptive design was used in this study. Setting: The study was conducted at inpatient units in Suez Canal university hospital. Subjects: 365 nurses working at inpatient units. in Suez Canal university hospital Tools: Using three tools namely; health problems related to work hazards, factors contributing to work hazards and actual hazards questionnaire. Results: It was found that more than half (53.1%,) of nurses exposed to actual hazard it was found that total factors of work hazards scored the percentage related to high level (40.6%). In addition, the highest percentage of nurses had more than three to six diseases related to work hazards were (34.5%). Conclusion: It was found that there was a statistical significant positive correlation between total actual hazards and number of diseases. Also, between total factors and number of diseases. Recommendations: The study recommends encourage health care workers to attend continuing education activities review update related to occupational health and safety program.

Keywords: Actual hazards, Factors, Health problems.

I. INTRODUCTION

Work hazards as biological, chemical, physical and psychosocial hazards, ergonomic, and accidental hazards are characterized as working environment issues that have likely to raise the danger of our health, which can be it's any situation of a work can deliver a negative impact on health workers, either over time or immediately. Many illness taking after injuries happen between nurses (World Health Organization & International Labour Organization, 2020).

Hospitals are unique from other work environments with respect to their construction and working conditions. The systems, long work hours, and stressful environment can negatively affect the health of nurses. Hospitals environment is of great importance among other healthcare settings (Aljohani et al., 2018).

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Maben& Bridge (2020) found that organizational factors such as supervision, management, and company culture as well as personal factors such as career goals and family circumstances also influence occurrence of a hazardous event, also technical factors as lighting, ventilation, building design. In addition, Lack of satisfaction with performance appraisal systems, low monthly income, high workload, and young age have been identified as significant predictors of turnover intention among(**Marques, 2018 ; Majeed& Jamsh, 2021**).

Significance of the study:

Much has been written about the well-being and quality of patients in recent years but little attention has been focused on well-being of nurses who provide comprehensive healthcare to patients. So, this study assess work hazards and factors contributing to them in relation to health problem among staff nurses at Suez Canal University Hospital.

Aim of the study: Assess work hazards and factors contributing to them in relation to health problem among staff nurses at Suez Canal University Hospital

II. SUBJECTS AND METHODS

Research Design: A correlational descriptive design was used in this study.

Setting: Inpatient units in Suez Canal university hospital

Participants: 365 nurses working at inpatient units in Suez Canal university hospital.

Instruments: Data were collected using two tools.

1) Health Problems related to Work Hazards: It had been developed based on reviewing relevant literature (**European Commission, 2011; Ali, 2015; Esallamy, 2018; Mohanty et al., 2019**). This part was consisted of 18 questions about health problems related work hazards under six domains biological (4items), chemical (2items), physical (3items), accidental (2items), ergonomic (4items) and psychosocial hazards (3items). **Scoring system:** This part was scored as (0) for No and (1) for Yes. These scores were converted into percent score.

2) Factors Contributing to Work Hazards This questionnaire had been developed based on international hazard data sheet on occupation for nurses by **European Commission (2011), National Institute Occupational Safety and Health (2014)** .It contains 32 items categorized into 5 dimensions; Technical factors (7 items), organizational (12 items), factors due to work tasks (5 items), personal (4 items) and psychosocial factors (4 items). It was scored using 3-point scale that range from (1) which indicate disagree, (2) unsure and (3) that indicate agree. A total score was calculated by summing responses over all factors, with score ranging from 32 to 96, The median of total factors had the cutoff point: 32 -47 indicates low factors contributing to work hazards and 48- 96 indicate high factors contributing to work hazards.

3) Actual exposure of hazards. This consisted of 30 items categorized into 6 dimensions; biological (5 items), chemical (4 items), physical (4 items), accidental hazards (4 items), ergonomic (5 items) and psychosocial hazards (8 items).

Actual hazards will be scored as (0) for No and (1) for Yes. The total scores were "30", was considered high if the percent was 50 % or more and low if less than 50%. The score of items were summed up and the total was divided by the number of items giving score (**Ali, 2015**).

Reliability and validity: These questionnaire were translated into Arabic. Then, tools were back translated into English for content validity achievement. This tool had been translated into Arabic. The study's questionnaires were examined for reliability by measuring the internal consistency of items using Cronbach's alpha coefficient test. The questionnaires were proved reliable where for 0.707 health problem questionnaire, 0.924 for factors contributing to work hazards. 0.820 for actual hazards exposures.

Field work

The data were collected over six months from November (2020) to April (2021). The study data collected from staff nurses after explaining aim of the study and how to fulfill the tools. The tools was distributed to nurses on the working unit over three shifts (morning, late and night) to complete it and the researcher attend when they complete it to answer their questions and clarify any nuclear item each one of them for 15 to 20 minutes.

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Administrative design:

Official permission to conduct the study was addressed by the dean of faculty of nursing to the managers of Suez Canal University Hospitals and obtained their permission for conducting this study and collecting data were issued, after explaining and clarifying the nature and purpose of the study.

Ethical considerations: Informed consent was gained from the study participants by eliciting the study purpose before asking them to participate in the study. They also assured about the anonymity and confidentiality of the information collected, and that it would be used only for scientific research. Each participant had the right to refuse to participate and to withdraw from the study at any time without giving any justification

Statistical design:

The Statistical Package for Social Sciences (SPSS) version 20.0 was used for data analysis. Mean and Standard Deviation (SD) were used for descriptive analysis whereas the Pearson Correlation test (r) was used for inferential analysis. P-value < 0.05 was set for the statistical significance

III. RESULTS

Table 1: demographic characteristics of the studied nurses (N=365)

Demographic characteristics	Total (n=365)	
	No.	%
Age group: /year		
20-30	269	72.2
30-40	78	21.4
> 40	18	4.9
Mean ± SD	32.42±9.50	
Range	20-45	
Gender:		
Male	146	40.0
Female	219	60.0
Educational level:		
Diploma	76	20.8
Technical institute	289	79.2
Years of experiences:		
≤ 5 years	189	51.7
> 5-10 years	79	21.65
> 10 years	79	26.6
Mean ± SD	8.79±4.82	
Range	3-15	
Department		
Critical	197	53.9
Non critical	168	46.1
Total training :		
No training	146	42.3
One training	156	45.6
Two training	33	13.1

Table (1) shows the demographic characteristics of the studied nurses. It was found that the highest percentage of nurses aged from twenty to thirty years old. Female nurses represented more than half (60.0%,) of the nurses . It was found that more than half (53.9%,) of nurses working at critical units, .The highest percentage of nurses had one training program followed by having no training (42.3&45.6 respectively)

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Table (2): actual hazards exposure among studied nurses (N=365)

Items	Nurses (n=365)			
	High		Low	
	No.	%	No.	%
Biological hazards	139	52.8	172	47.2
Ergonomic hazards	312	85.5	53	14.5
Mechanical hazards	64	17.5	301	82.5
Chemical hazards	332	90.9	33	9.1
Physical hazards	76	20.8	289	79.2
Psychosocial hazards	247	67.6	118	32.4
Total actual hazards	194	53.1	171	46.9

Table (2) describes actual hazards exposure among the nurses. It was found that actual exposure level of chemical hazards scored the highest percentage (90.9%) followed by actual exposure level of ergonomic hazards scored percentage (85.5%). While exposure level of accidental and physical hazards scored lowest percentage (17.5% & 20.8% respectively). It was found that more than half (53.1%) of nurses exposed to actual hazard

Table (3): Contributing Factors to work hazards among studied nurses (N=365)

Items	Study group (n=184)			
	Low		High	
	No.	%	No.	%
Technical factors	204	55.9	161	44.1
Organizational factors	190	52.0	167	48.0
Factors due to work task	147	40.3	117	59.7
Personal factors	214	58.6	151	41.4
Psychosocial factors	222	60.8	143	39.2
Total factors of work hazards	217	59.4	148	40.6

*: Statistically significant at $p < 0.05$

Table (3) describes contributing factors to work hazards among nurses. It was found that the highest percentage of factors of work hazards recorded high level toward that the factors due to work task (59.7%), Followed by Organizational factors (48.0%) compared to personal factor scored (39.2%). Also, it was found that total factors of work hazards scored the percentage related to high level (40.6%).

Table (4): Health problems related to work hazards among studied nurses (N=365)

Health problems		(N=3)			
		Yes		No	
		No	%	No	%
Biological hazards	Hepatitis C	2	0.5	363	99.5
	Covid 19	59	16.2	306	83.8
Chemical hazards	Dermatitis/allergy	188	51.5	177	48.5
	Respiratory infections/ problems	168	46.0	197	54.0
Physical hazards	Hearing problems due to noise	1	0.3	364	99.7
	Birth defects in fetus	2	0.5	363	99.5
Accidental hazards	Fractions	14	3.8	351	96.2
	Wounds	37	10.5	322	89.5

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Ergonomic hazards	Varicose veins	60	16.4	305	83.6
	Back pain	225	61.6	140	38.4
	Muscular pain	213	58.2	152	41.8
	Neck pain	180	49.4	185	50.6
Psychosocial hazards	Hypertension	25	6.8	340	93.2
	Sleep disturbances	154	42.2	211	57.8
	Depression	132	36.2	233	63.8
Number of diseases		No		%	
No diseases		27		7.3	
≤ 3 diseases		118		32.3	
> 3- 6		126		34.5	
> 6 diseases		49		13.4	

Table (4): indicates health problems related to work hazards among the nurses. It was found that highest percentage of nurses had Back pain followed Muscular pain and dermatitis/allergy (61.6%, 58.2% & 51.5% respectively). In addition, the highest percentage of nurses had more than three to six diseases related to work hazards were (34.5% respectively).

Table (5): Relation between total health problems, actual hazards and total factors (n=365)

Total health problems	Actual hazards				χ^2	P	factors				χ^2	P
	High (n=194)		Low (n=171)				Low (n=217)		High (n=148)			
	No	%	No	%			No	%	No	%		
No diseases	6	3.1	21	12.3	99.86	.000*	26	12.0	1	0.7	65.74	.000*
≤ 3 diseases	25	12.9	93	54.4			96	44.2	22	14.9		
> 3- 6	122	62.9	49	28.7			79	36.4	92	62.2		
> 6 diseases	41	21.1	8	4.7			16	7.4	33	22.3		

Table (5) shows Correlation between total actual hazards, contributing factors and number of diseases among nurses, it was found that there was a statistical significant positive correlation between total actual hazards and number of diseases, There was a statistical significant positive correlation between total factors and number of diseases

4. DISCUSSION

Nursing personnel are exposed to a wide range of workplace hazards more than other health care personnel because of the nursing nature of everyday jobs (Ejarque et al., 2021). Many studies have indicated the need. This study was conducted to assess Work hazards and factors contributing to them in relation to health problem among staff nurses at Suez Canal University Hospital.

Regarding, personal characteristics of staff nurses, it was found that age groups from twenty to thirty years recorded the highest percentage of nurses compared to age groups more than forty years recorded the least percentage. This result agrees with (Abd Rabo and Akel (2021) who recorded that age groups from twenty to twenty five years recorded the highest percentage.

Regarding training program, it was found that more than half of nurses had training course in biological hazards. The current study result may be due to concentration on biological hazards at this period of COVED 19 and preventive measures of infectious diseases, and more than one third of nurses had no training, while little of half of nurses had one training, and minority of them had two training that among nurses, this result is in accordance with the study conducted by El Hosseini et al., (2019) reported that the majority received these courses only once. compared to Dhahir (2021) who reported that more than half of nurses had work hazards courses.

Regarding actual hazards exposure among staff nurses. It was found that actual exposure level of chemical hazards scored the highest percentage compared to other hazards, followed actual exposure level of ergonomic hazards.

This may be due to the effective use of chemical agents and other disinfectants during coved period beside wearing gloves along day of work in addition to other preventive measure practice as result of training program.

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Regarding total actual hazards exposure among staff nurses, the present study revealed that, more than half of nurses exposed to actual hazards. because of less staffs, increasing work load, longer working hours, high clientele expectation and peculiar problems and hazards of work place.

Regarding factor of work hazards, this study showed that work task factors scored the highest percentage of factors, followed by organizational factors. This is may be due to long working days were associated with inadequate working conditions, work overload and stress, lack of lifting tools and transportation of patients, lack of protective equipment and tools, deficiency of information concerning use of recent tools and apparatus (Lala et al., 2019). The current study results related to organizational factors is agreed with Elewa et al., (2018) who presented that most of nursing under training alleged absence of educational and developmental programs for healthcare workers, regular medical examination, rules for occupational safety. Also, this is agreed with Elbilgahy (2019) who added that organizational factors as deficiency of medical treatment and inaccessibility of occupational safety and health rules in place, inadequate provision of personal preventive equipment and around half of the sample not accepts safety and health training.

Regarding health problems related to work hazards among staff nurses, this study showed that most of nurses had health problems of ergonomic hazards. This result may be due to the most procedures of nurses require standing for long period of time in providing different care for patient as lifting, medication, blood sampling and moving patient from one place to another for further diagnostic procedure Ejarque et al., (2021). The current study agrees with Elewa (2018) who reported that the nurses experienced more pain or discomfort with the highest incidence were the neck and shoulder pain.

While minority of staff nurse had health problems related to physical hazards, that result may be as result of nurses exposure to physical hazards sources such as radiation and noise is rarely. So they hadn't health problem as hearing problems due to noise, or congenital defects in fetuses or other that result from physical hazards exposures. The current study result related to technical factors involve exposure to noise, bad lighting which scored a lower level of factors contributing to work hazards.

Concerned to relation between total health problems, actual hazards and total factors, the present findings indicated positive correlation between total health problems, actual hazards and total factors. This finding in line with by Mohanty et al., (2019) who found that the nurses are more stressed because of less staffs, increasing work load, longer working hours, high clientele expectation and peculiar problems and hazards of work place. There is increased morbidity in nurses in comparison to general population. Also, This was supported by Dahir (2021) & Boateng (2022) who indicated that training course, monthly income, and Number of years of nurses have a great effect on health and safety of nurses.

5. CONCLUSION

Based on the finding of the current study, it was found that there was a statistical significant positive correlation between total actual hazards and number of diseases There was a statistical significant positive correlation between total factors and number of diseases

6. RECOMMENDATION

The study recommends encourage nurses to attend continuing education activities in the form of workshops, conferences, training programs, refreshing courses and review update related to "occupational health and safety program. Also, recommended developing recording & reporting system for hazards facing health care worker especially nurses to improve their safety and commitment to the health care setting.

REFERENCES

- [1] Aljohani, K. A. & Alomari, O. (2018). Turnover among Filipino nurses in and intention of primary healthcare workers to leave: a crosssectional and mental health. *Journal of Clinical Nursing*, 29(15-16), 2742.
- [2] Ali, A. M. (2015): Occupational hazards among staff nurses at intensive care units Unpublished Master Thesis, Faculty of Nursing, Cairo university, Egypt.
- [3] Boateng, A. B. (2022), Factors Influencing Turnover Intention among Nurses and Midwives in Ghana , 1Department of Occupationa and Environmental Health, School of Public Health, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, Hindawi Nursing Research and Practice Volume 2022, Article ID 4299702,8pages.

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 Vol. 11, Issue 1, pp: (389-395), Month: January - April 2024, Available at: www.noveltyjournals.com

- [4] Dhahir, D.M. (2021). Assessment of Health Workers Knowledge toward Occupational Health and Safety Program in Alkut City's Primary Health Care Centers Community Health Nursing, Nursing College, University of Babylon. Medico-legal Update, January.
- [5] Abd Rabo,. H.M ., & Akel, D. T. (2021). Workplace ergonomics training intervention and its effect on quality of nursing work life among nurse interns. Faculty of Nursing, Ain Shams University, Egypt.2021.DOI:10.5430/cns.v8n3p35. -March2021,Vol.21
- [6] Ejarque, M.E., Gemma, R. H, Roser, L. N. & Salvador,P.P.(2021). In Operating Room Nurses: A Multicenter Cross Sectional Observational Study INQUIRY: The Journal of Health Care Organization Provision, and Financing, Volume 58: 1–8.
- [7] El Hosseini, D.M, Ghanem, E.A &Gamal, D.A.(2019). Health Hazards, Occupational Safety Measures and Knowledge Assessment among Nurses Exposed to Chemotherapy Drugs in Ain Shams Universit Hospitals, Egypt *Egyptian Journal of Occupational Medicine, 2019; 43 (3) : 361-377*361.
- [8] Elewa.A.H., Aly,S.H.& El Banan, A . (2016). Occupational Hazards as Perceived by Nursing Interns and Protective Measures, Faculty of Nursing Cairo University (Egypt), IOSR Journal of Nursing and Health Science (IOSR-JNHS)e-ISSN: 2320–1959,p- ISSN: 2320–1940 Volume 5, Issue 6 Ver. I (Nov. - Dec. 2016), PP 107-118
- [9] **Eliwa, S. M. (2018)**. Occupational Health Hazards and Protective Measures among Radiation Health Team. Community Health Nursing, Faculty of Nursing- Zagazig, University Zagazig Nursing Journal, Vol.14, No.2.
- [10] Elpilgah, A. (2019). Occupational hazards and safety nursing guidelines for pediatric nurses in the health care setting, Mansoura University, Egypt Journal of Health, Medicine and Nursing www.iiste.org ISSN 2422-8419 An International Peer-reviewed Journal DOI: 10.7176/JHMN Vol.59, 2019.
- [11] El-Sallamy, R.M., Kabbash, I.A., Abd El-Fatah, S., & El- Feky, A. (2018). Physical hazard safety awareness among healthcare workers in Tanta university hospitals, Egypt. *Environmental Science and Pollution Research*. 2018; 25:30826-38..
- [12] European Commission. (2011). Occupational health and safety risks in the healthcare sector-Guide to prevention and good practice, Luxembourg: Publication Office of European Union 2011, 109-112, 173.
- [13] Lala, A.I., Sturzu, L. M., Picard, J. P., Druot, F., Grama, F., Bobirnac, G. (2019). Coping behaviour and risk and resilience stress factors in French regional emergency medicine unit workers: a cross-sectional survey. *J Med Life*. [Internet]. 2016[cited Feb 27, 2019];9(4):363-8. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5141395>.
- [14] Maben, J., & Bridges, J. (2020). Covid-19: Supporting nurses' psychological and mental health. *Journal of Clinical Nursing*, 29(15-16), 2742–2750. <https://doi.org/10.1111/jocn.153>
- [15] Marques-Pinto, E. H., Jesus, A. M., Mendes, O. C& Roberto, M. S.,(2018). Nurses' intention to leave the organization: a mediation study of professional burnout and engagement, *Spanish Journal of Psychology*, vol. 21
- [16] Mohanty, A., Kabi, A., & Mohanty. (2019). Health problems in healthcare workers: A review. Departments of 1Microbiology and 2Emergency Medicine, All India Institute of Medical Sciences, Rishikesh, Uttarakh.
- [17] Majeed. N., & Jamsh, S. (2021). Nursing turnover intentions: the of Nursing role of leader emotional intelligence and team culture.2021.*Journal Management*, vol. 29, no. 2, pp. 229–239.
- [18] National institute of occupational safety and health (2014): Occupational safety and health and safety of working environment, 1st ed., Egypt, 202-208,220,225,234.21) .
- [19] World Health Organization& International Labour Organization (2020). Caring for Those Who Care: National Programmes for Occupational Health for Health Workers. Policy Brief; World Health Organization: Geneva, Switzerland, 2020. www.iosrjournals.org