The Relationship between Nurses' Exposure to Occupational Health Hazards and Anticipated Turnover

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Abstract

Introduction*: Recently, occupational health and safety have attracted the attention of healthcare organizations worldwide as it is related to job satisfaction, staff productivity, organizational commitment, and nurses' anticipated turnover.* ***The aim of the study:*** *is to investigate the relationship between nurses' exposure to occupational health hazards and anticipated turnover.* ***Research design:*** *Descriptive Correlational design.* ***Setting:*** *inpatient units of medical, surgical, and critical care units at Alexandria Main University Hospital.* ***Subjects:*** *A non-probability convenience sample consisted of (276) nurses.* ***Tools:*** *two tools were used 1: Nurses exposure to the occupational health hazards questionnaire. 2: Anticipated Turnover Scale (ATS).* ***Results:*** *the highest percentage of nurses (79.2%) had a medium level of exposure to occupational health hazards. about two-thirds (62.7%) of nurses had a moderate probability of turnover. There was a weak statistically positive significant correlation between overall nurses' exposure to occupational hazards and their anticipated turnover (p= 0.029).* ***Conclusion:*** *nurses' anticipated turnover can be significantly predicted by their exposure to occupational health hazards.* ***Recommendations:*** *nurse managers should pay great attention to nurses exposure to occupational health hazards and their effect on nurses' anticipated turnover. Enhance safety culture. adopt appropriate strategies to improve the health of nurses, and promote job satisfaction to reduce the nurses' anticipated turnover.*

Keywords: nurse-occupational health hazards, and anticipated turnover

Introduction

Occupational health and safety have recently attracted the attention of healthcare organizations worldwide as it relates to job satisfaction, staff productivity, organizational commitment, and nurses' anticipated turnover (Suárez-Albanchez et al., 2021). World Health Organization [WHO] (2019) defined Occupational health as an area of work in public health to promote and maintain the highest degree of physical, mental, and social well-being of workers in all occupations. Occupational health hazard can be defined as a risk to an individual usually arising out of employment in the sense of the nature or working circumstances of a specific job (Vodanović et al., 2017).

Occupational health hazards are characterized as working environment issues that have likely to raise the danger of our health (Amare et al., 2021). The International Labor Organization (ILO) groups occupational health hazards OHH that affect healthcare personnel into physical, biological,

chemical, ergonomic, and psychological risks (Hsieh et al., 2011).

Physical hazards are defined as bodily pain and biological disturbances such as; sleep disturbances, leg pain, back pain, body pain, circulatory disturbances, arm pain, shifts in appetite, and disruptions in digestion. abnormalities of the respiratory system, vision, and hearing (Sabra & Morsy, 2016).

In relation to biological hazards, those are living things or substances which can cause illness or disease in humans (Ontario Nurses Association [ONA], 2019). It is critical to keep in mind that the Covid-19 pandemic-related circumstances of recent years have contributed to an intensification in health-related issues among nurses, mainly with regard to their stress levels and mental wellbeing (Nobari et al., 2021). (Nobari et al., 2021).

As regarding to chemical hazards, a wide variety of substances can be found in the healthcare setting. Among the potentially dangerous substances include formaldehyde, ethylene oxide, glutaraldehyde, and anesthetic gases. If not managed properly, several medications given to patients, such as cytotoxic medications, might even be hazardous to nurses.

Pertaining to Ergonomics is the study of how people work, including the tools and equipment they use, the environments in which they operate, and the psychological aspects of the workplace (Mohammad et al., 2019). Workers' muscles, tendons, ligaments, nerves, and/or blood vessels may be damaged if those components are not customized for the individuals who perform the work. The nature of the nursing profession is primarily to blame for these injuries.. (Ontario Nurses Association [ONA], 2019).

Concerning physiological hazards, Communication with patients is challenging for nurses due to the numerous stimulating elements they encounter. While performing nursing procedures, these nurses must deal with patients who are experiencing a range of emotional states, including sadness, worry, fear, and anger. (Chen et al., 2022).

The complexity of patient care increases nurses' risk of injury, in reality, there were always certain risks for nurses. This has adverse consequences, at both organizational and individual levels such as absenteeism, burnout, and high turnover (Park & Lee, 2016).

The concept of turnover has been researched for over a century (Hom et al., 2017). It significantly impacts the provision of high-quality services (Masum et al., 2016). The emphasis is on nurses' leaving the organization rather than those joining it. If excessive turnover of nurses is not anticipated, it can disrupt the quality of care provided to patients, lowering a hospital's performance. because a nursing shortage can cause long-term disruptions in patient care (Susanti & Rita, 2020).

Many healthcare organizations have faced significant challenges as a result of nurse turnover. There are implications for healthcare organizations and the profession as a whole when skilled nurses leave the field (Elshahat et al., 2019). Healthcare organizations are unable to achieve their objectives due to the high prevalence of nurse turnover (Salehi et al., 2020).

A good predictor of turnover among nurses is anticipated turnover, which is a psychological tendency to leave an organization or a profession (Labrague et al., 2018). Anticipated turnover may have been caused by the nurses' negative thoughts and attitudes toward their job (Alzayed & Murshid, 2017). Turnover includes the worker actually departure the organization, while anticipated turn over involves the worker show intent to resign, which may not lead to

actual departure from the organization (Lim & Parker, 2020). So, it is important to understand factors that influence nurses' turnover in the health-care system.

Aims of the Study

Investigate the relationship between exposure to occupational health 'nurses hazards and anticipated turnover

Research question:

1. What is the level of nurses' exposure to occupational health hazards?
2. What is the perception of nurses 'anticipated turn over?

What is the relationship between nurses 'exposure to occupational health hazards, and anticipated turnover

Materials and Method

Materials

Research design:

Descriptive Correlational design was used to conduct this study

Setting:

This study was conducted in all inpatient units of medical care units (n=25), surgical care units (n=17) and critical care units (n=14) at Alexandria Main University Hospital. It is the largest capitated university hospital in Alexandria, with large bed capacity (1825 beds).

Subject:

A non-probability convenience sample consisted of 276 nurses. It included nurses who were working in the previously selected units with experience at least one year, who were available during time of data collection and providing direct and indirect patient care. with level of confidence = 95%, Margin of error = 5%, Prevalence of the problem =50%. They were distributed by proportional allocation over the three previously mentioned units as the following: from medical care units

84 nurses, surgical care units 117 nurses and critical care units 75 nurses.

Tools of the study:

Two tools were used to conduct this study as follows:

Tool one: Nurses' exposure to the occupational health hazards questionnaire.

This tool was developed by Elsawy (2018) based on the framework of Keorekile (2015) to assess nurses' exposure to occupational hazards. It includes 37 items divided into five types of occupational hazards as follows: physical (8 items), biological (5 items), ergonomic (10 items), chemical (6 items) and psychological (8 items). This tool was tested for internal consistency of the items composing it by using cronbach's alpha test and proved high reliability (r=0.890) (Elsawy, 2018).

Nurses responded using five-point likert scale ranging from 1 to5 while 1= never exposed and 5= always exposed. All negative statement had a reverse score. The overall score will be ranged from 37- 185. The score was classified into 3 levels of exposure as follows: Low exposure range from 37-86, Medium exposure from 87 -135 and High exposure from 136-185

Tool two: Anticipated Turn-over Scale (ATS):

It was developed by (Hinshaw et al., 1987) and modified by (Liou, 2007). It is used to measure nurses' perception of the possibility to leave their current job position. It is composed of 12 items on self-report scale 5-point Likert scale.

Nurses was responded to 12 items ranging from 1 to 5. 1= strongly disagree and 5 = strongly agree. All negative statements had a reverse score. The total score of ATS ranges from 12 - 60. The score was classified into 3 levels as follows: from 12 – 28 indicate low

probability of turnover, from 29 –39 indicate moderate probability of turnover and from 40 -60 indicate high probability of turnover.

The ATS was tested for internal consistency of the items composing it by using cronbach's alpha test and proved high reliability (r=0.89) (Barlow & Zangaro, 2010).

In addition, a socio-demographic data sheet was developed by the researcher included questions related to study subjects, such as: age, gender, marital status, educational qualification, current working unit, years of experience in nursing and years of experience in the current working unit.

Method

An official permission was obtained from Ethical Research Committee, administrative authority at the Faculty of Nursing Alexandria University, and hospital administrators to collect the necessary data. Tool two was translated and back-translated into Arabic, and tested for face and content validity. Tool one was tested for internal consistency of the items composing it by using cronbach's alpha test and proved high reliability (r=0.890) (Elsawy, 2018). Tool two was tested for reliability by using cronbach's alpha test and proved high reliability (r=o,830). Pilot study was conducted by check10% of nurses (n=25) other than the study subjects. The researcher attended on a daily basis except Friday during morning and evening shifts. The time needed to fill the questionnaire was about 15 minutes. Data collection took a period of 3 months from 15/6/2021 to 15/9/2021.

Statistical analysis of the data

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, median. Significance of the obtained results was judged at the 5% level.

Results **Table 1**: shows distribution of the studied nurses according to their socio-demographic data. As indicated in this table, less than two thirds of the studied nurses (62.0%) were female, 38.0% of them had more than thirty years old with mean age of 35.07 $\pm$ 9.18 and more than one half of them (54.2 %) were married. According to educational qualification, 35.5% of the studied nurses had a bachelor's degree of nursing science (BSC Ng), as well as 33.5% had diploma degree of technical nursing schools.

This table also, illustrates that 41.2% of the studied nurses were working at surgical wards, 30.3% of them were working in critical care units and 28.5% were working at internal medicine units. 39.4% of them had less than 10 years of experience in nursing with a mean of 14.2 $\pm$ 9.73 years. regarding years of experience in the current working units, 61.7% of nurses had less than ten years of experience with a mean of 9.96 $\pm$ 8.34

Table 2: shows the mean percentage score of the studied nurses' exposure to the occupational health hazards. The mean percentage scores of the occupational hazards were illustrated as follows; for physical hazards, biological hazards, mechanical hazards, chemical hazards and psychological hazards. (47.67 $\pm$ 15.44, 50.77 $\pm$ 18.49, 63.95 $\pm$ 17.84, 49.30 $\pm$ 15.53, and 57.77 $\pm$ 19.58 respectively).

Table 3: illustrates the correlation between the studied nurses' exposure to the occupational health hazards and their anticipated turn over. There was a weak statistically positive significant correlation between overall nurses' exposure to occupational hazards and their anticipated turn over ATS (r= 0.130, p= 0.029). As regards the types of occupational hazards, only physical hazards had a weak positive significant

correlation with anticipated turnover (r= 0.135, p= 0.022),

Table 4: shows Multivariate analysis linear regression for nurses' anticipated turnover. It was used to assess the impact of nurses' exposure to occupational health hazards as an independent variable on anticipated turnover as a dependent variable. This table reveals that there was statistically significant relationship between nurses'exposure to occupational health hazards and anticipated turnover (p= 0.02) This means that nurses' anticipated turnover can be significantly predicted by their exposure to occupational health hazards.

Discussion Occupational health and safety became an emergent issue today, the protection of health and safety of nurses contributes to improve the productivity, job satisfaction and retention of nurses (Ghoudarzi, H. et al.,2019). This study aimed to assess the exposure to 'relationship between nurses occupational health hazards and anticipated turnover among nurses in Alexandria Main University Hospital. As a result of complex nature of health care organizations nurses faced by many occupational health hazards, The truth that 90% of the injuries corresponded to nurses especially less experienced staff. This is due to the sensitive nature of their profession and the aspects of sustained direct patient care (Soares et al., 2019).

The present study revealed that the most studied nurses had moderate exposure to occupational health hazards. from the researcher point of view, this result may be supported because lack of occupational health and safety policy, and poor training of the staff nurses on occupational health and safety practices. nurses did not have adequate protection from work-related hazards in their workplace. Due to absence of health education programs, and control measures to allay the hazards for healthcare workers in hospitals. This result is supported by Al-Sarraji et al. (2017) who illustrated that the majority of

participants have moderate levels of occupational risks that face the nurses inside the operational room. Ebadi (2018) also supported the result who found the level of exposure to occupational hazards of medical staff in military hospitals was moderate. However this result is contradicted with Shamkh et al. (2022) who found a low level of exposure to occupational health hazards among the studied nurses.

The present study demonstrate that highest mean percentage score perceived by the studied nurses was related to mechanical hazards (ergonomics). This result can be related to high risk working environment, because the floor is wet when housekeeping personnel are cleaning it, no sign is placed, which allows nurses to slip and get injury, lack of hazards assessment, and poor training of the nurses on body mechanics techniques raise the chance of nurses to be injured while lifting patients. patient-handling tasks, are the primary contributors to back strain and shoulder injury. Also, long-time standing could be a risk factor, because of nurse's negligence, needle was left uncovered so, the rest of staff are exposed to risk of needle stick injury.

Alternatively, the result of this study revealed that the lowest mean percentage score spotted by the studied nurses was related to physical hazards. This could be attributed to good design of main university hospitals that allow good ventilation and lightning. The study setting also did not include operating rooms or radiation departments in which high risk of exposure may be expected.

The present study finding discovered that, psychological hazards rated the second most frequent hazards marked by the studied nurses. The nurses stated that the nursing profession is a very stressful profession because, of spending extended periods of time with the grieving, dealing with patients who are unconscious, long working hours every

day, and lacking rest between shifts. They also reported that they were not satisfied with their profession and that there was a lack of collaboration between staff, poor nurse–physician contact and a lack of support from direct managers. The psychosocial risk factors identified by nurses were high levels of stress, anxiety, mental exhaustion, low decision latitude, increased workload, and monotonous work. The finding of the present study is in congruence with Nasser Rayan et al. (2021) indicated that psychological hazards were at a second level of hazards

In addition, the result of this study illustrated that the study nurses had a moderate probability of turnover. According to their point of view, obligatory overtime and low salaries as well as, they stated that they will leave if only have a higher salary and more benefits. Their anticipated turnover is adversely correlated with poor working conditions and organizational inefficiencies. the result goes with Ghandour et al. (2019) they found that above one half of professional nurses (52.5 %) had a moderate level of intention to leave. Also, Maleki et al. (2023) concluded that about half of the nurses desired to leave the profession and the mean score of the intention to leave was higher than moderate

The result of this study was surprising to the researcher as it proved that there was a weak statistically significant positive correlation between overall nurses' exposure to occupational hazards and their anticipated turnover. strong relation was expected. From the researcher's opinion the weak relation is due to the assumption of formally employed nurses are less likely to live their position. They prefer to stay in a governmental hospital because it provides postretirement benefits,

and also provides compensation in case of injury or disability. This result is opposed to Boateng et al. (2022) who found that the prevalence of turnover intention was 87.2% and About 61.5% of the study participants were exposed to high levels of workplace hazards.

Conclusion based on the results of the present study, the researcher concluded that:79.2 % the studied nurses had medium level of exposure to occupational health hazards, mechanical hazards were the most prevalent type of hazards, 62**%** of the studied nurses had moderate probability to turn over, and There was a weak statistically positive significant correlation between overall nurses' exposure to occupational hazards and their anticipated turn over.

Recommendations
Nurse mangers:

- For the purpose of determining the cause(s) and preventing a recurrence, examine any occurrences, accidents, or near misses involving the health and safety of nurses.

Nurses:

- Use Personal Protective Equipment (PPE) as provided by organization to reduce risk to his/her safety and health.

Table (1): **Distribution of the Studied Nurses According to Their Socio-demographic Data (n = 284)**

Q	Socio-demographic data	No.	%
1	**Age (years)**		
	<30	93	32.7
	30-<40	108	38.0
	40-<50	57	20.1
	≥50	26	9.2
	Min. – Max.	20.0 −59.0	
	Mean ± SD.	35.07 ±9.18	
	Median	34.0	
2	**Gender**		
	Male	108	38.0
	Female	176	62.0
3	**Marital status**		
	Single	106	37.3
	Married	154	54.2
	Divorced	9	3.2
	Widow	15	5.3
4	**Educational qualification**		
	Diploma degree of secondary nursing schools	95	33.5
	Diploma degree of technical science institute (nursing branch)	88	31.0
	Bachelor of Nursing Science	101	35.5
5	**Current working unit**		
	Internal medicine	81	28.5
	Surgery	117	41.2
	Critical care	86	30.3
6	**Years of experience in nursing**		
	<10	112	39.4
	10-<20	89	31.4
	20-<30	58	20.4
	≥30	25	8.8
	Min. – Max.	1.0 −39.0	
	Mean ± SD.	14.21 ±9.73	
	Median	12.0	
7	**Years of experience in the current working unit.**		
	<10	175	61.
	10-<20	62	21.8
	20-<30	39	13.7
	≥30	8	2.8
	Min. – Max.	1.0 −39.0	
	Mean ± SD.	9.96 ±8.34	
	Median	8.0	

SD: Standard deviation

Table (2) Mean Percentage Score of The Studied Nurses' Exposure to Occupational Health Hazards (n = 284)

Nurses' exposure to the occupational health hazards	Total score	Mean percentage Score %
Physical hazards		
Min. – Max.	8.0 – 40.0	0.0 – 100.0
Mean ± SD.	23.25 ± 4.94	47.67 ± 15.44
Biological hazards		
Min. – Max.	5.0 – 25.0	0.0 – 100.0
Mean ± SD.	15.15 ± 3.70	50.77 ± 18.49
Mechanical hazards		
Min. – Max.	16.0 – 50.0	15.0 – 100.0
Mean ± SD.	35.58 ± 7.14	63.95 ± 17.84
Chemical hazards		
Min. – Max.	6.0 – 30.0	0.0 – 100.0
Mean ± SD.	17.83 ± 3.73	49.30 ± 15.53
Psychological hazards		
Min. – Max.	10.0 – 40.0	6.25 – 100.0
Mean ± SD.	26.49 ± 6.27	57.77 ± 19.58

SD: Standard deviation

Table (3): Correlation Between the Studied Nurses' Exposure to Occupational Health Hazards and Their Anticipated Turn-over (n = 284)

Nurses' exposure to the occupational health hazards	Anticipated Turn-over	
	r	p
Psychological hazards	0.082	0.168
Chemical hazards	0.076	0.200
Mechanical hazards	0.083	0.162
Biological hazards	0.085	0.152
Physical hazards	0.135	0.022
Overall nurses' exposure to the occupational health hazards	0.130	0.029

*: Statistically significant at $p \leq 0.05$
not statistically significant P-value > 0.05
highly statistically significant P-value < 0.01
r: Pearson coefficient
0.00-0.19: "very weak"
0.20-0.39: "weak"

Table (4): Multivariate Linear Regression Analysis for Nurses' Occupational Health Hazards with Their Anticipated Turn over

	B	Beta	t	p	95% CI	
					LL	UL
Occupational hazards	0.131	0.130	2.195	0.029	0.014	0.249
R^2 =0.017, F = 4.820 , p = 0.029						

R^2: Coefficient of determination

F, p: f and p values for the model

B: Unstandardized Coefficients

Beta: Standardized Coefficients

t: t-test of significance

CI: Confidence interval

LL: Lower limit

UL: Upper Limit

p: Statistically significant at $p \leq 0.05$

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