

Potential Occupational Health Hazards among Nurses working at Obstetrics-gynecology and Medical-Surgical Wards: Suggested Preventive Strategies.

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Abstract: Nursing staff face a broad range of workplace hazards exposure than other health care workers because of the nature of nursing responsibilities concerning twenty-four hours interactions care with the patients.

Aims of the study were 1) Evaluate the potential occupational health hazards and its contributing factors among nurses working at Obstetrics-gynecology and Medical-Surgical wards. 2) Develop & validate the required preventive strategies to overcome occupational health hazards.

Method: A descriptive methodological design was utilized in this study.

Setting; the study was conducted at the Obstetrics-gynecology and medical-surgical wards at Shaqra General Hospital, Shaqra governorate in Saudi Arabia.

Subjects: A purposive sample of 100 nurses was taken from the target hospital.

Instruments: Four Instruments were used, an interviewing questionnaire, Contributing factors questionnaire, Work-Related Symptom Scale (WRSS) and Opinionative Sheet.

Results: The findings revealed that the mean age of the study participants of nurses was (34.03 ± 7.81) years old and 75% of them were females. The work overload was the most common contributing factors (65%) for occupational health hazards among studied nurses. The physical health hazards were in the first category which happened among study participants of nurses, its rate was about 53.2% followed by chemical, biological, social and physiological hazards with rates (48.75%, 48.15, 44.2% and 41.73%) respectively. There were strong positive correlations between all types of health hazards. There was no correlation between age, years of experience and health hazards, but there was a significantly increase in the mean score of all health hazards in the female nurses.

Recommendations: Preventive strategies for occupational hazards should be applied and practiced at Obstetrics-gynecology and Medical- Surgical wards, disseminated by the hospital administration to all departments, reviewed, revised and updated periodically as appropriate and as necessary.

Key words: Occupational Health Hazards, Obstetrics-gynecology, Medical-Surgical, Nurses, Preventive strategies.

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I. Introduction

A lot of attention has been paid to improve occupational safety and health (OSH). OSH relates to health, safety and welfare issues in the workplace. Laws, standards and programs related to OSH aim to make the workplace better for workers, co-workers, family members, customers and other stakeholders [1] as well as nurses who are a crucial component of the healthcare system. They are an integral part of clinical services

especially in Obstetrics-gynecology and medical-surgical Departments. They have primary responsibility for a significant proportion of patient care in most health care settings [2]. An occupational hazard is a “potential source of harm or adverse health effects on persons, resulting from the work that one does or from the environment in which one works” [3].

Nursing staff face a broad range of workplace hazards exposure than other health care workers because of the nature of nursing responsibilities concerning twenty-four interactions care with the patients, performing invasive and noninvasive nursing procedures such as drug administration, hygienic care positioning, turning and walking patients, etc.^[4]. Furthermore, nurses particularly in Obstetrics-gynecology and medical-surgical being the largest category of health care workers have a critical role to play in the healthcare delivery system. They are at the highest risk of exposure to occupational health hazards among healthcare workers. They routinely come into contact with blood and body fluids, chemicals, radiations, etc. which are very hazardous to their health^[5].

Simply put, workplace hazards are any aspect of work that cause health and safety risks and have the potential to harm. An occupational hazard refers to risk or danger as a consequence of the nature of the working conditions of a particular job. Some hazards are more likely to be present in some units than others, and depending on nursing care do, there will be hazards that are more or less relevant^[6].

There are numerous types of workplace hazards, which frequently encountered hazards in a healthcare setup include biological (infectious) hazards, chemical hazards, physical hazards, environmental hazards, psychological, and mechanical hazards. Biological hazards are mostly infectious hazards for instance bacteria, viruses, fungi and parasites, which cause diseases such as HIV/AIDS, tuberculosis, hepatitis and other blood borne infections^[7, 8].

Physical hazards commonly found in health facilities include radiation, exposure to slippery floors, sleep disturbance, shifting appetite and assault by confused, body pain, leg, pain and back injury due to manual lifting of patients. This is the main (support vague claim) and a common hazard in hospitals and health centers whereby lifting, turning, moving and adjusting beds by hand are routine activity of daily work^[9].

Chemical hazards are medications, solutions, gases, vapors, aerosols, and particulate matter that is potentially toxic or irritating to the body system. Moreover, environmental hazards are elements that can cause or potentiate accidents, injuries, strains, or discomfort such as damaged equipment. Psychosocial hazards are factors that can cause stressor interpersonal issues among the worker^[10, 11]. Therefore, the most ideal approach to protect nurses from workplace hazards is to identify and manage them and take reasonable safety measures to prevent their potential to harm, control workplace hazards and eliminate or decrease the risk^[12, 13].

Occupational health hazards have a harmful effect on the individual's health and safety as well as organizational effectiveness, while occupational safety describes a comprehensive concept for the protection of workforce from health risks in the workplace, which results from the job-related activity, biological, chemical and physical effects^[14].

Many strategies used to reduce work-related hazards. Hand washing and personal protective equipment is the most important measures to safeguard nurses that continuously in contact with patients that make them liable to occupational hazards, predominantly in developing countries where occupational safety control rules and principles remain a challenge to implement. Hand washing and use of personal protective equipment is ordered by the Occupational Safety and Health Administration for healthcare workers to prevent infection with blood borne disease such as^[15, 16, 17 & 18].

Establishing guidelines and preventive strategies to reduce occupational health hazards and maintain safety among nurses is an essential part to achieve security and welfare in the workplace and as a result good quality of patient care and safety. The primary step to do that is assessing the work-related hazards and its contributing factors among nurses then developed preventive strategies.

Significance of the study:

Safety of healthcare workers (HCWs) especially nurses is essential for patient's safety. Despite of this fact, HCWs are at high risk of work-related injuries (WRI). Those injuries include falls, musculoskeletal disorders, needle stick injuries (NSIs) and workplace violence. These injuries have a negative impact on HCWs and reduce the quality of care. Therefore, it is important to analyse the occurrence of WRIs to design better targeted interventions to ensure safety environment and improve work conditions in hospitals, which in turn, can improve the quality and outcomes of patient care^[19, 20].

Nurses continue to report high levels of job-related injury and illness. Working environment, responsibilities, and duties of nurses put them in the frontline of numerous occupational hazards. According to a National Survey on occupational hazards in the United States, the incidence rate of occupational injury and illness for the medical and healthcare organization was as high as 6.6% and ranked fourth out of 56 services in 2012. Moreover, reported more incidents of back strain, dermatitis, infectious hepatitis, infectious diseases, psychological disorders, eye diseases and toxic hepatitis, substantial morbidity and mortality among healthcare workers inevitably lead to loss of skilled personnel and adversely impact health care services which are already

strained in low and middle-income countries. So, this study was carried out to evaluate the potential occupational health hazards among nurses working at Obstetrics-gynecology and Medical-Surgical departments, and then suggest preventive strategies to apply based on the results of the study.

Aims of the study:

1. To determine the most common contributing factors for the potential Occupational Health Hazards among nurses working at Obstetrics-gynecology and Medical-Surgical departments.
2. To evaluate the potential occupational health hazards among nurses working at Obstetrics-gynecology and Medical-Surgical departments.
3. To develop and validate the required preventive strategies to overcome occupational health hazards

Research Questions:

1. What are the most common contributing factors for the potential Occupational Health Hazards among nurses working at Obstetrics-gynecology and Medical -Surgical departments?
2. What are the occupational health hazards among nurses working at Obstetrics-gynecology and Medical -Surgical departments?
3. Is there a relationship between demographic characteristics and occurrence of occupational health hazards among nurses working at Obstetrics-gynecology and Medical -Surgical departments?
4. What are the preventive strategies to overcome occupational health hazards?

II. Materials And Method

Research design:

Descriptive methodological design was utilized to meet aims of the study.

Setting:

The study was conducted at the Maternity, Newborn, Medical-Surgical departments that include: (Obstetrics-gynecology ward, Delivery Room, Male, Female Medical and Surgical wards at Shaqra General Hospital, Shaqra Governorate – Saudi Arabia.

Study Sample

A convenience sample of nurses was recruited in this study included 100 nurses working in the previously mentioned settings and fulfilled the inclusion criteria.

The inclusion criteria defined for sample choice were as following: (nurses were working in the previously mentioned settings for at least one year continuously with full time employment and agree to participate in the study).

The sample also included: Jury committee sample (15 experts). Included doctors, nursing and academic staff to assess the content and face validity of designed preventive strategies.

Sample size for studied nurses:

The ideal sample size was calculated using this formula (*Israel, 2013*)²¹:

$$n = \frac{N}{1 + N(e)^2}$$

Where; n= sample size; N= total population number (132 nurses); e= margin error(0.05).

Instruments of data collection:

Four instruments were utilized by the researchers to achieve the aim of the study and to collect the necessary data. These instruments were as follow:

Instrument I: Structured Interviewing Questionnaire:

It was developed by the researchers to collect demographic data of the subjects. It was comprised of two parts related to nurses 'social and demographic characteristics such as their age, sex, nationality, marital status, years of experience, educational level, etc. and work characteristics as current job, department, training or workshops regarding occupational health hazards.

Instrument II: Contributing factors questionnaire:

It was settled by the researchers after reviewing the related literature. It concerned with potential contributing factors. It contains 10 sentences about these factors to be answered with agree or disagree. The

percent of agreement of nurses will be calculated in each factor. The high percent means; this strong potential contributing factors for occupational health hazards.

Instrument III: Work-Related Symptom Scale (WRSS),

It was adapted from *Ferreira and Mendes (2007)*²² and modified by researcher. It consisted of (39) items, it is arranged into **five categories**: the original instrument contained three categories; physical hazards, psychological hazards, and social hazards, all resulting from the situations faced in work settings. The researchers develop and add two categories; the chemical and biological hazards (Eight items) after revising the related literature. It is a five-point Likert scale, a value of 1 denoted to totally absent symptom, and a value of 5 referred to a highly present symptom. Its categories were described as follows:

The 1st category was physical hazards; it described bodily pain and biological disturbances and contained 11 items.

The 2nd category was psychological hazards, is defined as negative self-perception, negative outlook on life in general, and shifts in mood and is comprised of 11 items

The 3rd category was social hazards; it described the feeling of isolation and problems in family relations and it comprised 9 items

The 4th category was the chemical hazards described acute or chronic detrimental health effects due to exposure to chemicals, it included 4 items: skin and eye irritation, latex allergy and chronic poisoning.

Finally, the 5th category was biological hazards; it described the health threats or diseases due to exposure to living organisms from the biological source it contained 4 items.

Scoring system: the total score for each hazard was obtained by collecting the score of its items and dividing it by its numbers, the results were categorized into three levels; between 1.0 and 2.3 were considered satisfactory; between 2.3 and 3.7 moderate; more than 3.7 were considered dangerous.

Reliability: *Ferreira and Mendes (2007)* tested the reliability of the questionnaire of WRSS for the first three categories and reported that they had high internal consistency with Cronbach's alpha equal 0.84 for physical hazards, 0.92 for psychological and 0.88 for social hazards. The last two categories; chemical and biological hazards are tested for reliability using a test and retest technique and Pearson correlation coefficient formula to determine relevance and consistency of the questionnaire, the values were $r = 0.87$ and 0.88 respectively.

Instrument IV: Opinionative Sheet:

The sheet was developed to assess the content validity of preventive strategies. It involved the opinions of the experts for each item were recorded on a two-point scale: relevant or not relevant.

Administrative considerations:

To carry out the study, the necessary approvals were obtained from the Hospital Director and Nursing Director of Shaqra University Hospital, upon official letters issued to them from the College of Applied Medical Sciences explaining objective of the study and requesting permission for the collection of data.

The content validity and reliability:

After reviewing the literature extensively, the study instruments I, II, and III were developed by the researchers while Instrument I adapted from *Ferreira and Mendes (2007)*. They were tested for their content's validity by a panel of 5 experts in academic staff (in Maternity & New-born and Medical-Surgical health nursing) and non-academic staff like experts in occupational health hazards, infection control and quality assurance for comprehensiveness and applicability. The expert's suggestions were considered and the Instruments were altered. The final Instruments took its shape after alterations based on the opinion of guides. The reliability of the interviewing questionnaire and contributing factors questionnaire were measured using a test and retest method and Pearson correlation coefficient to ascertain relevance and consistency of the tools to measure their items. The values were $r = 0.85$ and 0.87 respectively.

Ethical Considerations

Prior to the conduction of the pilot study, ethical approval was obtained from the Scientific Research Ethical Committee of Shaqra University. Numerous strategies were utilized to protect the nurse's rights who approved to participate in this study. First, oral consent of the nurses was gained prior to the administration of the questionnaire. The nurses were informed of the aim of the study, and that they had the right to refuse to share. Also, the voluntary nature of participation was stressed as well as confidentiality. Furthermore, the nurses were told that they can refrain from answering any questions and they can terminate at any time. Anonymity of the nurses was maintained at all times.

Pilot study

The pilot study was carried out on ten nurses were not included in the study to assess the simplicity and applicability of the Instruments. Based on its result, modifications and omissions of some details were done and then the final forms were developed.

Procedure of data collection:

- Data were collected within three months between 25 December 2018 and 25 February 2019.
- The aim of the study and components of the instruments were explained in simple words to the nurses at the beginning of data collection. They were assured that the information collected would be treated privately and that it would be used only for the purpose of the study.
- An interview was carried out by the researchers for all nurses who participated in the study to collect socio-demographic data and fill the Contributing factors questionnaire and occupational health Hazards sheet by using Instruments I, II and III. It took about 25 - 30 minutes through interview with each nurse.
- The data were tabulated and analysed to evaluate the potential occupational health hazards and its contributing factors among nurses working at Obstetrics-gynecology and Medical-Surgical departments.
- Then based on the results of the study the researchers designed suggested preventive strategies for nurses working at the previous mentioned settings to protect them from potential occupational health hazards.
- The content validity of preventive strategies will be assessed by 15 experts included doctors, nursing and academic staffs, then these strategies were provided to administrative authorities of Shaqra General Hospital to apply it.

III. Statistical Analysis

The collected data were organized, categorized, tabulated and analysed using the Statistical Package for Social Sciences (SPSS) windows version 20. For qualitative data, tables use numbers and percentages. For quantitative data the table use mean, range and standard deviation. An independent samples-test was used to find the association between variables. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at $p \leq 0.05$.

IV. Results

Table (1) showed that (40%) of studied nurses had age between 31 to 40 years with mean age (34.03 ± 7.81) and three quarters of studied nurses were females. Moreover about two-thirds of the studied nurses were single, and the most of them (54%) had experience in nursing more than 10 years. They had different nationalities but, the larger number is Pilipino (43%).

The figure (1) represented that 75% of studied nurses had a bachelor of nursing.

The figure (2) illustrated 89% of nurses received educational program about occupational Hazards. **Table (2)** showed that the nurses viewed the work overload was the more precipitating factors for occupational hazards where it took agreement from (65%) of nurses in the study. The other contributing factors were arranged as follows; Lack of lifting tools and transportation of patients (42%), Lack of equipment and tools for protection (38%), inadequate knowledge concerning use of new tools and equipment (35%), Lack of a regular medical examination (33%), Lack of a regular medical examination (29%), Ineffective supervision (26%), unavailability of vaccinations (18%), and the last one deficiency of rules and measures for occupational safety in the hospital units (15%).

Table (3) reported that the physical hazards are the most common hazards among nurses with mean (2.70), followed by chemicals, biological, social and Psychological hazards with mean (2.40, 2.30 and 2.11, respectively).

Table (4) reported that the back pain/ache is highly present in 42% of nurses and leg pain was found in 39% of nurses. Shifts in appetite and body pain were also represented in high percent among nurses respectively (36%, 33%).

Table (5) demonstrated that the most common chemical health hazards that the patient suffered from were Latex allergy due to gloves and other medical devices and Skin defatting, irritation use of soaps, detergents, disinfectants where they were found among (19% and 18%) of the nurses respectively.

Table 6 indicated that the common biological health hazards that the nurse prone to was risk of having a nosocomial disease due to a prick from needles as. Infectious hepatitis, syphilis, malaria; this was the opinion of 21% of the nurses.

Table (7) showed that family relation difficulties were present among 17% of the nurses and affective relation difficulties were found among 15% of nurses. But 14% of studied nurses had sensitivity toward others.

Table (8) illustrated that; the most common psychological symptoms among nurses were sadness and feeling of emptiness where they was present respectively among (19% and 13%) of nurses.

Table (9) demonstrated that there was no correlation between age or years of experiences and all types of occupational hazards, but it indicated strong positive correlation between the mean scores of all types of occupational hazards

Table (10) revealed that; the female nurses had significant higher scores in the occupational hazards than male nurses with p value < 0.05 at physical, social, chemical, and biological hazards. There was no statistically significant difference was found between educational qualifications regarding to mean scores of occupational hazards where p value > 0.05.

Table (11) displayed that the majority of experts (80% to 100%) reported that suggested preventive strategies for overcoming the potential health hazards are relevant.

Table (1): Distribution of demographic data and work characteristics among studied nurses (N=100).

Personal characteristics	Number of nurses	
	frequency	percent
Age		
22to 30 years	36	36
31 to 40 years	40	40
41 to 51	21	21
More than 50 years	3	3
o Mean ± SD/Range	34.03 ±7.81 20 - 52 years	
Sex		
o Mae	15	15
o Female	75	75
Marital status		
o Married	36	36
o Single	61	61
o Divorced	3	3
Years of experience		
o 1 - 5 years	31	35.9
o 6-10 years	14	14.1
o >10 years	54	50
o Mean ± SD/ Range	11.13± 7.75 / 1 - 30 year	
Nationality		
o Saudi	38	38
o Pilipino	43	43
o Indian	15	15
o Egyptian	2	2
o Jordan	2	2

Figure 1: Education qualifications of studied Nursing:

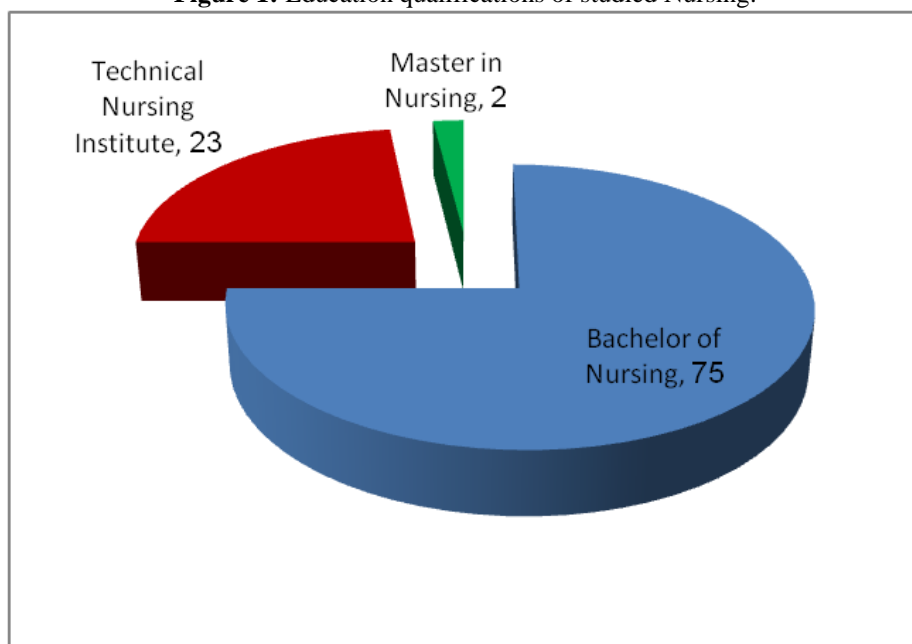


Figure2: Attendance program about occupational Hazards among studied nurses

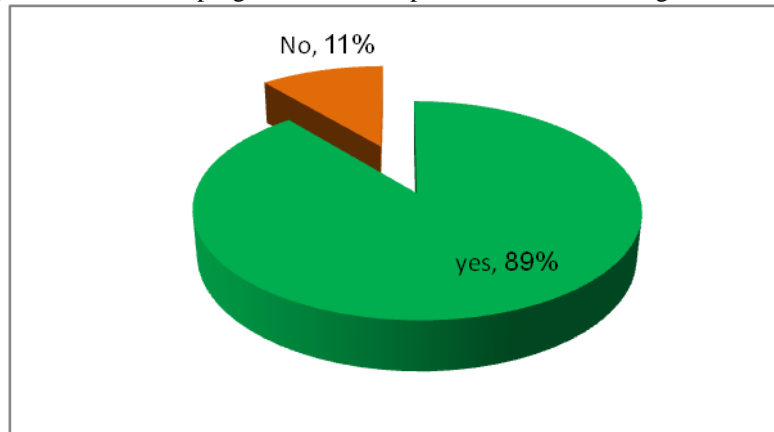


Table2: Nurses' perception in relation to Contributing factors for occupational healthhazards (N=100).

Contributing factors for occupational Hazards		Yes		Rank
		No.	%	
1.	Work overload.	65	65	1
2.	Lack of lifting tools and transportation of patients.	42	42	2
3.	Lack of equipment and tools for protection.	38	38	3
4.	Inadequateknowledgeconcerning use of new tools and equipment.	35	35	4
5.	Lack of a regular medical examination.	33	33	5
6.	Lack of continuing educational and developmental programs for healthcare.	29	29	6
7.	Ineffective supervision	26	26	7
8.	Improper preparation of healthcare providers.	24	24	8
9.	Non-availability of medical immunizations / vaccinations	18	18	9
10.	Deficiency of rules and measures for occupational safety in the hospital units.	15	15	10

Table 3: Distribution of occupational health hazards among studied nurses (N=100).

Types of Hazards	Mean Score	Rank
physical Hazards:	2.70 ±0.787	1
Chemical Hazards	2.40± 0.869	2
Biological Hazards	2.30 ± 1.07	3
Social Hazards:	2.11 ± 0.709	4
Psychological Hazards:	2.07 ± 0.644	5

Table 4: Frequency distribution of physical health hazards among studied nurses (N=100).

Physical Hazard	Highly Absent		Absent		Nearly Present		Present		Highly Present	
	No.	%	No.	%	No.	%	No.	%	No.	%
1. Sleep disturbance.	7	7.0	24	24.0	31	31.0	21	21.0	17	17.0
2. Leg pain.	5	5.0	22	22.0	24	24.0	39	39.0	10	10.0
3. Back pain	6	6	17	17	24	24	42	42.0	42	42.0
4. Body pain	7	7.0	21	21.0	31	31.0	33	33.0	8	8.0
5. Circulatory disturbances	13	13.0	44	44.0	17	17.0	23	23.0	3	3.0
6. Arm pain.	10	10.0	29	29.0	30	30.0	26	26.0	5	5.0
7. Shifts in appetite.	10	10.0	21	21.0	32	32.0	36	36.0	1	1.0
8. Digestive disturbances	11	11.0	33	33.0	31	31.0	24	24.0	1	1.0
9. Auditory disturbances	17	17.0	66	66.0	8	8.0	8	8.0	1	1.0
10. Visual disturbances	19	19.0	56	56.0	12	12.0	13	13.0	1	1.0
11. Respiratory disturbances	22	22.0	58	58.0	11	11.0	9	9.0	0	0.0

Table 5: Frequency distribution of chemical health hazards among studied nurses (N=100).

Chemical Hazards:	Highly Absent		Absent		Nearly Present		Present		Highly Present	
	No	%	No	%	No.	%.	No	%	No	%
1. Irritation of the eyes, nose, and throat because of contact to airborne aerosols or exposure to droplets of washing and cleaning liquids.	17	17.0	44	44.0	27	27.0	10	10.0	2	2.0
2. Chronic poisoning because of long-term exposure to medications, sterilizing fluids.	25	25.0	50	50.0	15	15.0	9	9.0	1	1.0
3. Latex allergy due to contact with gloves and other medical supplies that contain latex.	18	18.0	28	28.0	32	32.0	19	19.0	3	3.0
4-Skin, irritation, and dermatitis due to repeated use of soaps, cleaners, sterilizers, etc.	15	15.0	31	31.0	30	30.0	18	18.0	6	6.0

Table 6: Frequency distribution of nurse's perception of biological health hazards (N=100).

Biological Hazards	Highly Absent		Absent		Nearly Present		Present		Highly Present	
	No	%	No	%	No	%	No	%	No.	%
1-Infections as a result of the contact to blood, body fluids such as HIV, and infectious hepatitis.	23	23	39	39	19	19	13	13	6	6
2-Risk of having a nosocomial disease due to a prick from needles (e.g. Infectious hepatitis, syphilis, malaria).	21	21	31	31	21	21	21	21	6	6
3-potential risk of contracting palm and finger herpes.	24	24	38	38	20	20.	12	12.	6	6
4- Increased hazard of spontaneous miscarriages.	26	26	45	45	13	13	10	10	6	6

Table 7: Prevalence of social hazards among studied nurses (N=100).

-Social Hazards:	Highly Absent		Absent		Nearly Present		Present		Highly Present	
	No.	%	No.	%	No.	%	No.	%	No	%
1-Family relation difficulties	22	22.0	34	34.0	22	22.0	17	17.0	5	5.0
2-Affective relation difficulties.	15	15.0	45	45.0	20	20.0	15	15.0	5	5.0
3-Insensitivity towards others.	15	15.0	49	49.0	22	22.0	14	14.0	0	0.0
4- Social life difficulties.	15	15.0	47	47.0	29	29.0	8	8.0	1	1.0
5- Find it difficult to make friends.	21	21.0	52	52.0	21	21.0	5	5.0	1	1.0
6- Social isolation.	20	20.0	54	54.0	21	21.0	5	5.0	0	0.0
7- Difficulty in making decisions regarding personal life.	20	20.0	52	52.0	25	25.0	3	3.0	0	0.0
8- Overall disinterest towards others	29	29.0	49	49.0	19	19.0	3	3.0	0	0.0
9- Uncontrolled aggressiveness.	31	31.0	51	51.0	14	14.0	4	4.0	0	0.0

Table 8: Frequency distribution of Psychological hazards among studied nurses (N=100).

Psychological Hazards:	Highly Absent		Absent		Nearly Present		Present		Highly Present	
	No.	%	No.	%	No.	%	No.	%	No	%
1-Sadness.	16	16.0	39	39.0	26	26.0	19	19.0	0	0.0
2-Irritation /angry with everything	18	18.0	40	40.0	38	38.0	4	4.0	0	0.0
3- Loss of self-confidence.	20	20.0	52	52.0	25	25.0	3	3.0	0	0.0
4- Feeling of emptiness.	19	19.0	43	43.0	25	25.0	13	13.0	0	0.0
5- Loss of self-control.	23	23.0	51	51.0	17	17.0	8	8.0	1	1.0
6- Feeling of bitterness.	20	20.0	58	58.0	18	18.0	4	4.0	0	0.0
7- Feeling of defeat.	23	23.0	56	56.0	14	14.0	7	7.0	0	0.0
8- Crying for no apparent reason.	30	30.0	47	47.0	20	20.0	3	3.0	0	0.0
9- Willingness to give everything up.	23	23.0	56	56.0	14	14.0	7	7.0	0	0.0
10-Long-lasting feeling of despair.	27	27.0	57	57.0	12	12.0	3	3.0	1	1.0
11-Negative image of oneself.	33	33.0	49	49.0	15	15.0	3	3.0	0	0.0

Table 9: Correlation between years of experience, age and occupational health Hazards among studied nurses (N=100)

Hazards Variables	physical	psychological	Social	Chemical	Biological
Experience/ years	r = 0.049 p = 0.626	r = 0.148 p = 0.142	r = 0.115 p = 0.255	r = 0.020 p = 0.843	r = 0.006 p = 0.954
Age	r = 0.064 p = 0.53	r = -0.182 p = 0.070	r = -0.085 p = 0.39	r = 0.008 p = 0.94	r = 0.031 p = 0.76
physical	-	r = -0.76** p = 0.00	r = 0.75** p = 0.000	r = 0.69** p = 0.000	r = 0.78** p = 0.000

<i>psychological</i>	-	-	r =0.75** P = 0.00	r = 0.60** P = 0.000	r=0.67** p = 0.000
<i>Social</i>	-	-	-	r=0.74** P =0.000	r=78** p =0.000
<i>Chemical</i>	-	-	-	-	r =0.83** p =0.000

Table 10: The relationship between sex, educational qualifications and occupational health hazards among studied nurses (N=100).

Hazards Variables	physical	psychological	Social	Chemical	Biological
Sex					
Male M ± SD	30.46 ± 6.89	22.62 ± 4.29	15.61 ± 3.54	6.92 ± 2.46	7.23 ± 2.48
Female M ± SD	35.19 ± 9.74	25.40 ± 8.17	20.52 ± 6.71	10.17 ± 3.59	9.98 ± 4.59
T- test	P =.0.04*	P = 0.07	P = 0.000**	0.002**	0.003**
Educational qualifications					
Bachelor o nursing	33.85 ± 9.79	24.81 ± 8.65	19.25 ± 6.91	9.46 ± 3.88	9.28 ± 4.41
Technical nursing institute M ± SD	36.30 ± 8.57	25.47 ± 4.43	21.30 ± 5.01	10.65 ± 2.74	10.73 ± 4.74
Master in Nursing M ± SD	42.00 ± 9.89	28.50 ± 6.36	27.50 ± 3.54	10 ± 0.00	10 ± 0.00
Anova test	P = 0.304	P = 0.772	P = 0.109	P = 0.392	P = 0.392

Table 11: Suggested preventive strategies based on the results of the study

1-physical Hazards:	Relevant		Not Relevant	
	N	%	N	%
Design workplace which places the worker's body in a neutral place.	15	100	0	0
Utilizes "ergonomically friendly" and adaptable tools at workstations	15	100	0	0
Reduce the risk factors that increase potential for injury by control risk system.	15	100	0	0
The number of Nurses must be adequate to reduce work load	15	100	0	0
Allows for short rest periods and exercises at nurse office.	14	93.33	1	6.67
Allows time for enough sleeping	15	100	0	0
2- Psychological Hazards:	Relevant		Not Relevant	
	N	%	N	%
Discover stress hazards, assess for considerable harm, and establish effective control measures.	14	93.33	1	6.67
Reporting of signs and symptoms of stress and fatigue must be optimistic by all staff.	13	86.67	2	13.33
May need to be developed a confidential reporting system.	12	80	3	20
3-Social Hazards:	Relevant		Not Relevant	
	N	%	N	%
Allow one to work more efficiently and effectively; and help one feel better while at work.	15	100	0	0
Provide the nursery for children in the morning	14	93.33	1	6.67
Provision of buses to deliver nurses	15	100	0	
Distribute time schedule in manner that comfort to other nurses	14	93.33	1	6.67
4- Chemical Hazards:	Relevant		Not Relevant	
	N	%	N	%
Material Safety Data Sheet (MSDS) should be appropriately kept and easily reached to all staff members.	14	93.33	1	6.67
Elimination of hazardous substances wherever possible.	15	100	0	
Substituting with a less toxic substance should be considered, or the same substance in a less hazardous form or process (e.g. using a less flammable solvent; or using detergent rather than acid for cleaning).	14	93.33	1	6.67
Isolation of the hazardous substance by putting distance or shielding between the substance and the worker.	14	93.33	1	6.67
Broad-spectrum and local ventilation to remove or reduce the concentration of airborne contaminants such as fumes gases and vapors.	14	93.33	1	6.67
Protection of the staff by the prerequisite of personal protective equipment to prevent physical contact with the staff.	14	93.33	1	6.67
Safe work practices through management decisions that require persons to work in safer ways.	14	93.33	1	6.67
Staff education regarding chemical hazards, along with health surveillance of exposed staff, will enhance the effectiveness of any safety programmed.	15	100	0	
Skin contact should be avoided at all times and suitable protective clothing worn.	14	93.33	1	6.67
Staff should be aware of the potential health effects related to latex sensitivity, so that adverse reactions can be recognized and anticipatory steps taken before symptoms become severe.	15	100	0	0
Encourage staff to seek help if actual or possible allergy presents	15	100	0	0
Provide alternatives to latex-based devices as necessary	15	100	0	0
Assemble purchasing data so that informed choices can be made as soon as purchasing.	15	100	0	0
Identifying waste materials	15	100	0	0

	15	100	0	0
5- Biological Hazards:	Relevant		Not Relevant	
	N	%	N	%
Training staff in waste management procedures and hazards.	15	100	0	0
Staff access to suitable testing and vaccination programmers	15	100	0	0
Measures for monitoring nursing personnel health	15	100	0	0
Baseline monitoring for previous exposures (e.g. Hepatitis B immune status)	14	100	1	6.67
Reporting serious harm injuries to the OHD.	14	93.33	1	6.67
Staff education and training in philosophy, policies, principles and procedures of infection control.	15	100	0	0
Implementation of control system, e.g. engineering controls, such as a fitting ventilation system.	15	100	0	0
Standard work procedures and protocols to protect nursing personnel health.	15	100	0	0
Procedures to regularly monitor the work environment and work practices to assess compliance with the facility's infection control and health and safety policies	15	100	0	0
Procedures for ensuring that standard precautions are used throughout the facility	15	100	0	0
Policies and procedures of the Infection Control Programme outlined all routine, and any specific purpose cleaning such as isolation areas, surgical suites, used patient care equipment and the handling of contaminated spills.	15	100	0	0
Policies and procedures for the safe collecting, handling, storage and distribution of laundry.	13	86.76	2	13.33
Measures for dealing with soiled items and laundry from people with known infections.	15	100	0	0

V. Discussion

Nurses are a central element of the healthcare system. They are an integral part of clinical services especially in medical-surgical and maternity newborns departments. They have chief duty for a significant proportion of patient care in most health care locations^[23]. Nurses are subjected to exposure for occupational hazards through their contact with patients, physical and psychological job demands, as infectious diseases, harmful substances, back injuries, etc.^[24].

The results of current study succeed in answering research questions in identifying the contributing factors of occupational health hazards and the most common occupational health hazards among maternity, newborn and medical-surgical nurses. The findings of the current study will be discussed as a following:

In reference to contributing factors of occupational health hazards, the results of current study showed that all nurses assured that, the work overload was the more precipitating factors for occupational hazards where it took agreement from more than half of nurses in the study. It is a fact, that there was big shortage in nursing field because it is very difficult work especially in closed units like Intensive care units (ICU), Operating Rooms (OR) Delivery rooms (DR) and also in opened units like an emergency and inpatients departments in medical-surgical or obstetrics-gynecological. This is consistent with^[24] who confirmed that overwork and tension are other factors which affect the health of nurses and can reason weakness and overtiredness.

While The other contributing factors were arranged as a follows; Lack of lifting tools and transportation of patients, Lack of protective equipment and tools, Deficiency of information concerning use of recent tools and apparatus, Lack of a regular medical examination, Lack of educational and developmental programs for health care, Ineffective supervision from the senior or the head of department, Non-availability of vaccinations, and the last one Absence of policies and measures for occupational protection in the unit. These findings were in accordance with many authors who studying the contributing factors for occupational health hazards, Moreover, Elewa & El Banan^[25] presented that most of nursing under training alleged absence of educational and developmental programs for healthcare workers, regular medical examination, rules for occupational safety and failed supervision as causative contributing factors for occupational hazards. This also was agreed with Wube^[26] who informed that there was a deficiency of medical treatment and inaccessibility of occupational safety and health rules in place, and around half of the sample not accepts safety and health training. In the same line with Almur^[27] who conveyed that respondents not take a training regarding safety applies. While the only one who was reversed to the present study by Eljedi^[28] who stated that availability of safety strategies in Gaza Palestine. Finally, the contributing factors hang on the nature of each hospital or place, although there is a basic corner in all health care centers or hospitals.

Related to grade of occupational hazards, findings of the current study assured that, the more prevalent hazards among maternity-newborn and medical-surgical Nurses was the physical hazards followed by chemical and biological. The social hazards come after biological, and the less prevalent one was psychological hazards. This is in accordance completely with Abidoye et al^[29] in Nigeria who showed the ranking of occupational hazards as a follow: physical hazards, chemical hazards and biological hazards. Also, this is supported by^[25] when studying occupational hazards as alleged by nursing interns and protective procedures at intensive care rooms at Cairo University Hospital, Egypt, however they showed that nursing interns had high mean score for physical hazards followed by chemical hazards. Also, this was supported by Alexander-Lindo et al^[30]. In the same line Branco et al^[31] conduct a study in the free hospital in the Federal District, the study

indicated that the occurrence of physical hazards for nurses working at intensive care rooms were critical at a single Brazilian institution, but the psychological and social hazard levels were reasonable. In addition to, in Egypt Morsy & Sabra^[32] concluded that nurses rank physical hazards in the first line followed by psychological and social hazards. In Contrast to the previous research findings in Gaza Palestine, by Eljedi^[28] indicated that revelation to psychological hazards was high within all occupational hazards for nursing undergraduates. Isara & Ofili^[14] also reported that all nurses are disposed to occupational hazards in the course of their day to day activities in the health care settings.

As regards to frequency and distribution of physical hazards, this study indicated that; the most common physical hazards were back pain/ache, leg pain, body pain, plus shifts in appetite and also sleep disturbance presented among many nurses. Both back pain and leg pain might be due to many causes like long standing of nursing during sterilization in operating room or delivery rooms, overload in a shift, and patient lifting devices deficiency. This is supported^[2] who reported that, the majority of nursing complained of limb pains, back ache, body pains as chief reasons of physical occupational dangers. This was in agreement with previous studies carried out by Karimi et al^[33] and Abbas et al^[34] who revealed that low back ache and neck discomfort were main occupational health problems and denotes a giant burden on nursing staff and on the health care system.

In addition to, Andersen et al^[35] demonstrated that health care providers presented a higher prevalence of low back ache among occupational categories. In contrast of these findings^[32] in only one point and demonstrated that, the first physical hazards among nurses at **Quena University Hospital** was sleep disturbances, due to rotation shifts which lead to disrupted sleep habit among nurses. While they agreed with the findings of the current study in exploring that Leg pain was mostly present among nurses.

Regarding to chemical health hazards, this study explained that, the most common chemical health hazards that the patient suffer from were rubber allergy caused by contact to usual rubber gloves and other medical devices encompassing latex, and Skin defatting, irritation, and dermatitis due to recurrent usage of soaps, detergents, antiseptics solutions, etc. where they were found among (19% and 18%) of the nurses respectively. This might be the nurses were responsible for preparing the patients for any minor or major operation, cesarean section, normal deliveries, and any condition that there is an increased direct contact with the patients which need to more disinfection, hand washing with soap and disinfectant solutions and wearing of gloves so, they are more susceptible to irritation of the skin. This is supported by a study by Babatunde^[36] in Nigeria; they reported that the chemical hazards among nurses included sensitive contact dermatitis. In addition to, Adeoye et al^[37] and Cardoso et al^[38] presented that many of respondents had skin sensitivity from usage of chemicals to hygienic the hand.

Related to biological health hazards the findings of current study indicated that the common biological health hazards that the nurses prone to danger of contracting a nosocomial illness as an outcome of a prick from a syringe needle as hepatitis, this was the opinion of numerous nurses. In addition to high risk to infections because of the contact to blood, body fluids or tissue specimens possibly leading to blood-borne illnesses such as HIV, Hepatitis B and Hepatitis C. All the hospitals are highly infectious environment, maternity-newborn, and medical-surgical nurses are connected with blood and bloody fluids, when dealing with placenta, umbilical cords, open hysterectomy and IV infusion & blood transfusion daily, open wounds in the wards and closed areas. Moreover, they are exposed to direct contact with blood in the operating theater. The injury by sharp objects cause about 2 million HBV, 900,000 HCV and 170, 000 HIV infections among health-care staffs each year globally (WHO)^[39] explained that medical sharp damages have been documented as one of the occupational hazards among healthcare staffs. This is supported by Awaji & Alahmary^[20] who concluded that, nurses had the maximum rate of needle stick injuries (NSIs) and work place violence as compared to other health care staffs.

In the equal line several studies by Mbaisi et al^[40] Abdo, et al^[41] and Ahmed et al^[42] proved that, the high occurrence and burden of occupational hazards in hospitals include blood –borne illness such as hepatitis B and human immunodeficiency by being exposed to infectious sharp things such as needle stick damages, scalpels, broken glass or throughout taking blood samples, and connecting or withdrawing of needles from patients.

Looking at social hazards, the current study showed that Family relation difficulties, affective relation difficulties, and sensitivity toward others were found among nurses. This is well-matched with Elewa, & Elbanan^[25] who revealed that, the intern nursing students experienced trouble in making friends, social loneliness and social life problems. Despite the young age of internship nurses. The nurses suffer from the same social problems. In the identical line a study completed by Morsy and Sabra^[32] proved that many nurses experiencing trouble in decision making regarding private life followed by social life problems and affective relation difficulties, while the only one who acknowledged a few social difficulties was Branco et al^[31] and The International Council of Nurses (2011) who admitted little level of social hazards among nurses.

Concerning topsychological hazards; sadness and felling of emptiness were the main manifestations of psychological hazards among the studied nurses. This means that the nursing profession imposes a bad psychological condition on its employees. Also, Morsy& Sabra ^[32] demonstrated that long-lasting feeling of despair, followed by irritation with all, Loss of self-confidence and sensation of defeat. Furthermore, this finding Consistent with Tan ^[43] who found that, the emotional stress which is inherent in the job of nursing affect the mental health of nurses. There is a study that contradicts this view by Shimizu et al ^[44]who originated satisfactory level by esteem to adverse feelings as (loss of self-confidence, feeling of defeat, and long-lasting feeling of despair). In addition, this finding in line with Tan ^[43]who found that, the emotional strain which is inherent in the job of nursing appears to affect the mental health of nurses.

Concerned to **years of experiences andoccupational hazards**, the results of this study demonstrated that, there was no correlation between age or years of experiences and all types of occupational hazards this opposite to Zarrini, et al^[45] who reported that significant differences were observed between age, work experience and occupational hazards, but the present findings indicated strong positive correlation between the mean scores of all types of occupational hazards. This finding in line with Welker –Hood ^[46] who underlined that job stress is a hurtful response bodily and emotionally when the employee's skills, funds and requirements could not complete the prerequisite of the job. *Moreover* Verhaeghe et al ^[47]specified that High level of stress at nursing work especially in emergency units and obstetric departments is a major threatening factor to both physical and psychological health of individuals. Vahey et al^[48]who clarified that nurses work in stressful environment, which has unfavorable effects on their social relation, psychological and bodily health, and efficacy at work, absenteeism in addition to on patients' outcomes such as increased mortality and patient frustration. These finding Contrast to Shimizu et al ^[44]who concluded that there is no significant difference between physical, psychological, and social hazards between the start and termination of the careers of ICU nurses and nursing specialists, signifying that there is no cumulative outcome, since fatigue is formed by the work itself.

Finally, the current study informed that there was no statistically significant alteration among educational qualifications regarding to mean scores of occupational dangers among the nurses of the study. This is compatible with the fact which tells that the exposure to occupational health hazards depend on other factors not related to education and qualifications. Zarrini et al ^[44] contrasted with these findings where they observed a significant difference between occupational hazards and educational levels of the nurses. But the same study supported the findings of the study that showed significant differences between males and females regarding to mean scores of all occupational health hazards where they reported that, there were significant differences between occupational hazards and variables of gender (P = 0.0001)

VI. Conclusion

According to the results of this study, it could be concluded that, the work overload was more precipitating factors for occupational health hazards among Obstetrics-gynecology& medical surgical nurses who were prone to many occupational health hazards because of the nature of their work. The more prevalent hazards among them were the physical health hazards followed by chemical and biological health hazards. Also, there was no correlation between age or years of experiences and all types of occupational hazards, nor between educational qualifications regarding to mean scores of occupational hazards but there was confident correlation between the mean scores of all types of occupational hazards and there was a statistically significant increase in the mean scores of occupational health hazards in the females than males.

VII. Recommendation

- ❖ Preventive strategies for occupational hazards should be apply and practice at Obstetrics-gynecologyand Medical-Surgical departments, disseminated by the hospital administration to all departments, reviewed, revised and updated periodically as appropriate and as necessary.
- ❖ On-site training programs about occupational health hazards and safety issues especially among emergency units nursing staff.
- ❖ Availability of necessary vaccination for all health care providers according to the place of work (hospital).
- ❖ Close observation about personal protective equipment from all seniors or heads of all departments (professional standards of safety).
- ❖ Further studies for accidental hazards and its preventive measures among new employed nurses.

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