

## Effectiveness of an Educational Program in Enhancing Nurses' Knowledge about Occupational Health Hazards

### فاعلية برنامج تعليمي في تحسين معارف الملاك التمريضي عن مخاطر الصحة المهنية

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#### المستخلص:

**الهدف:** اختبار مدى فعالية برنامج تعليمي في تحسين معارف الممرضين عن المخاطر المهنية الصحية في مستشفيات مدينة الطب في مدينة بغداد.

**المنهجية:** استخدم الباحث تصميم شبه تجريبي في البحث الحالي. تم تنفيذ الدراسة للمدة من (٢٠) شباط الى (١) نيسان (٢٠١٨). شملت العينة غير الاحتمالية (العينة الملائمة) من البحث (٦٠) ممرض، ممن يعملون في مستشفيات مدينة الطب في بغداد، تم تقسيمهم الى مجموعتين (٣٠) مجموعة الدراسة و(٣٠) المجموعة الضابطة. صُممت استمارة استبائية كأداة لجمع البيانات تتناسب والغرض من الدراسة، تم جمع البيانات بواسطة التقرير الذاتي في الاستمارة الاستبائية، حيث اشتملت الاستمارة على ستة أجزاء (أ) الخصائص الاجتماعية والديموغرافية؛ (ب) المعرفة بالمخاطر الفيزيائية؛ (ج) المعرفة بالمخاطر الكيماوية؛ (د) المعرفة بالمخاطر البيولوجية؛ (هـ) المعرفة بالمخاطر النفسية؛ (و) المعرفة بالمخاطر الميكانيكية. أجريت الدراسة على (١٠) ممرضين لاختبار الثبات والموثوقية من الاستبيان وللفترة من ١ شباط ولغاية ٨ شباط ٢٠١٨. تم تحليل البيانات باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) اصدار (٢٤) لنظام الويندوز.

**النتائج:** أشارت النتائج الرئيسة للدراسة الى ان هنالك فروق ذات دلالة احصائية بين جميع معارف الممرضين المتعلقة بالمخاطر الصحية المهنية: المخاطر الفيزيائية والمخاطر الكيماوية، والمخاطر البيولوجية، والمخاطر النفسية، والمخاطر الميكانيكية، في مجموعة الدراسة من خلال مرحلة ما بعد الاختبار، وما بعد الاختبار الثاني

**التوصيات:** يوصي الباحث بضرورة تطوير وتنفيذ برامج تعليمية خاصة للممرضين؛ لتحسين المعرفة فيما يتعلق بالمخاطر الصحية المهنية.

**الكلمات المفتاحية:** التعليم ، المخاطر ، التمريض ، الصحة المهنية .

#### Abstract

**Objective:** To determine the effectiveness of an Educational Program in Enhancing Nurse's Knowledge about Occupational Health Hazards at Medical City Hospitals in Baghdad City.

**Methodology:** The present study employed a quasi-experimental design held at Medical City Hospitals in Baghdad City. A non-probability sample (convenience sample) consisted of (60) nurse. Data were collected by using a self-report questionnaire which consisted of six parts (a) socio-demographic characteristics (b) physical hazards knowledge (c) chemical hazards knowledge (d) biological hazards knowledge (e) psychological hazards knowledge and (f) mechanical hazards knowledge. Data were analyzed using the statistical package for social science (SPSS) for windows Version 24.

**Results:** There were statistically significant differences in nurses' knowledge about occupational health hazards (physical hazards, chemical hazards, biological hazards, psychological hazards, and mechanical hazards) in the study group through posttest I, posttest II.

**conclusion:** The occupational health hazards-based health education program was influential in enhancing nurses' knowledge related to occupational health hazards.

**Recommendations:** The researcher recommended the need to develop and carry out special educational programs for nurses to enhance their knowledge regarding occupational health hazards.

**Keywords:** Education, Hazards, Nursing, Occupational Health.

**Introduction:**

Occupational health hazard is a threat or danger accepted as a consequence of the nature or working conditions of a particular "job". Occupational health hazard (OH) can also be classified as a risk to a person usually arising out of employment <sup>(1)</sup>. The World Health Organization has defined environmental health as; "aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psycho-social factors in the environment". It also refers to the theory and practice of inspecting, assessing, correcting, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations. It was only in 1950 that a Joint Committee between the WHO and the ILO provided a definition of the occupational health aims which was accepted by the world community: "the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations" <sup>(2)</sup>.

Occupational hazards cause multiple forms of injury or disability. The loss of human resources, which can lead to reduced productive and service capacity and in some serious situations, may result in the death of the workers. Thus, leading to the loss of competent staff. Also, in developing countries, poor professional performance of health care providers may undermine the quality of health care institutions, particularly among nurses <sup>(3)</sup>. Hospitals have many unique hazards that may possibly affect the health of workers. Risk exposure throughout the hospital unit is highly variable. Exposure to chemicals can occur from disinfectants, sterilizers, cleaning compounds, anesthetic gas, mercury, and hazardous drugs. Biological hazards include viruses that cause hepatitis B, C, HIV, TB (MRSA), methicillin-resistant staphylococcus aureus and latex sensitivity <sup>(7)</sup>. Physical hazards include lighting, heat, noise, ionizing and non-ionizing radiation. Finally, psychological stress and organization of work include a threat of violence in the workplace, exhaustion and seizures. Control and risk reduction in the workplace for healthcare staff in hospitals are an exclusive challenge to the health and well-being of patients in hospitals must also be considered <sup>(5)</sup>. Nursing staffs face a wide range of hazards exposure in workplace than other health

care workers because of the nature of nursing responsibilities that involving many of interactions care of patients, performing hard procedures such as positioning/ turning/walking patients <sup>(4)</sup>. Nurses have been selected to be the focus of attention in this study because they represent the largest group of health care staffs in hospitals and they have an essential role in the health care delivery system. Nurses generally serve as the main interface with patients. It is fair to state that the healthcare setting will stop working in the absence of nurses <sup>(6)</sup>.

**Methodology:**

A quasi-experimental design which was used to guide this study. which was conducted from the period of October 14<sup>th</sup> 2017 to May 1<sup>st</sup> 2018. The study included a non-probability "convenience" sample consist of (60) nurses. The Study Instrument is a self-report questionnaire which consisted of six parts. A 3-point Likert type scale was used to measure nurses' knowledge about physical, chemical, biological, psychological and mechanical hazards. The questionnaire format and the educational program were designed and constructed by the researcher after reviewing the related literature. Data were collected through utilization of the study instrument. The questionnaire was submitted to the nurses for the pretest prior to the implementation of the program. Post1 test is employed immediately after that. Post2 is performed four weeks later. As a result of conducting a pilot study, reliability was determined through the implicated the cronbach alpha technique on a convenient sample of (10) nurses are selected from the Baghdad medical city hospitals for pilot study. Internal consistency is employed for the determination of the instrument reliability Cronbach alpha by computed for such determination. validity determined through a panel of 10 experts. Data were analyzed through the use of Statistical Process for Social Sciences (SPSS) version 24.0 for windows.

**Ethical Considerations**

The Institutional Review Board (IRB) at the University of Baghdad, College of Nursing approved the study to be conducted. The study protocol meets both the global & the Committee on Publication Ethics(COPE) standards of respecting humans subjects' rights.

## Results

**Table (1): Participants' sociodemographic and employment characteristics**

Variables	Study (n =30)		Control (n =30)	
	Frequency	Percent	Frequency	Percent
Residency				
Urban	30	100.0	30	100.0
Rural	0	0.0	0	0.0
Gender				
Male	19	63.3	18	60.0
Female	11	36.7	12	40.0
Age				
20-25	3	10.0	5	16.7
26-30	5	16.7	7	23.3
31-35	5	16.7	4	13.3
36-40	8	26.7	5	16.7
41-45	7	23.3	6	20.0
46-50	2	6.6	3	10.0
*Marital status				
Not married	4	13.3	7	23.3
Married	22	73.3	18	60.0
Divorced	4	13.3	5	16.7
*Educational qualification				
High school	7	23.3	11	36.7
Diploma	10	33.3	7	23.3
Bachelor's degree	13	43.3	12	40.0
Years of experience in nursing				
1-5	6	20.0	8	26.7
6-10	9	30.0	11	36.7
11-15	9	30.0	5	16.7
16-20	4	13.3	3	10.0
≥ 21	2	6.7	3	10.0
The unit you currently work in				
Ward	11	36.7	10	33.3
Emergency room	4	13.3	7	23.3
Operation room	7	23.3	5	16.7
ICU/CCU	2	6.7	2	6.7
Other	6	20.0	6	20.0
Monthly income (Iraqi Dinar [ID])				
300.000-600.000	13	43.3	17	56.7
601.000-900.000	7	23.3	7	23.3
901.000-1.200.000	8	26.7	3	10.0
≥ 1.501.000	2	6.7	3	10.0
Participation in training courses				
Yes	23	76.7	20	66.7
No	7	23.3	10	33.3

\* The total percent for the study group is not precisely 100.0%

**Table (2): Difference in physical hazards over time**

Ranks		N	Chi-Square	df	Asymp. Sig.
Study Group	Mean Rank				
Pretest	1.05	30	53.560	2	.000
Posttest I	2.48				
Posttest II	2.47				
Ranks		N	Chi-Square	df	Asymp. Sig.
Control Group	Mean Rank				
Pretest	2.02	30	.018	2	.991
Posttest I	1.98				
Posttest II	2.00				

In the study group, there is a statistically significant difference in the score of the participants' knowledge about physical health hazards over time (Chi-square = 53.560, df = 2, p-value = .000). For the control group, there is no statistically significant difference in the score of the participants' knowledge about physical health hazards over time.

**Table (3): Difference in chemical hazards over time**

Ranks		N	Chi-Square	df	Asymp. Sig.
Study Group	Mean Rank				
Pretest	1.07	30	56.000	2	.000
Posttest I	2.47				
Posttest II	2.47				
Ranks		N	Chi-Square	df	Asymp. Sig.
Control Group	Mean Rank				
Pretest	2.02	30	.250	2	.882
Posttest I	1.93				
Posttest II	2.05				

In the study group, there is a statistically significant difference in the score of the participants' knowledge about chemical health hazards over time (Chi-square = 56.000, df = 2, p-value = .000). For the control group, there is no statistically significant difference in the score of the participants' knowledge about chemical health hazards over time.

**Table (4): Difference in biological hazards over time**

Ranks		N	Chi-Square	df	Asymp. Sig.
Study Group	Mean Rank				
Pretest	1.00	30	59.363	2	.000
Posttest I	2.52				
Posttest II	2.48				
Ranks		N	Chi-Square	df	Asymp. Sig.
Control Group	Mean Rank				
Pretest	2.07	30	.679	2	.712
Posttest I	1.88				
Posttest II	2.05				

In the study group, there is a statistically significant difference in the score of the participants' knowledge about biological health hazards over time (Chi-square = 59.363, df = 2, p-value = .000). For the control group, there is no statistically significant difference in the score of the participants' knowledge about biological health hazards over time.

**Table (5): Difference in psychological hazards over time**

Ranks		N	Chi-Square	df	Asymp. Sig.
Study Group	Mean Rank				
Pretest	1.07	30	53.455	2	.000
Posttest I	2.47				
Posttest II	2.47				
Ranks		N	Chi-Square	df	Asymp. Sig.
Control Group	Mean Rank				
Pretest	1.95	30	.891	2	.641
Posttest I	1.92				
Posttest II	2.13				

In the study group, there is a statistically significant difference in the score of the participants' knowledge about psychological health hazards over time (Chi-square = 53.455, df = 2, p-value = .000). For the control group, there is no statistically significant difference in the score of the participants' knowledge about psychological health hazards over time.

**Table (6): Difference in mechanical hazards over time**

Ranks		N	Chi-Square	df	Asymp. Sig.
Study Group	Mean Rank				
Pretest	1.00	30	54.320	2	.000
Posttest I	2.57				
Posttest II	2.43				
Ranks		N	Chi-Square	df	Asymp. Sig.
Control Group	Mean Rank				
Pretest	1.97	30	.358	2	.836
Posttest I	1.95				
Posttest II	2.08				

In the study group, there is a statistically significant difference in the score of the participants' knowledge about mechanical health hazards over time (Chi-square = 54.320, df = 2, p-value = .000). For the control group, there is no statistically significant difference in the score of the participants' knowledge about mechanical health hazards over time.

In the posttest time II, participants who have each of (16-20) and 21 years or more have better knowledge about mechanical health hazards than those who both (1-5) years and (6-10) years, and those who have (11-15) years. However, there is no statistically significant difference in participants' knowledge about mechanical health hazards among years of experience in nursing groups.

## Discussion:

There was a statistically significant difference in the score of the participants' knowledge in the study group about physical health hazards over time. This reflects the positive influence of the health education program in enhancing nurses' knowledge about physical health hazards. This finding is consistent with that obtained by Joshi P, and other. <sup>(8)</sup>, who inferred the significant improvement in knowledge and awareness ( $p < 0.001$ ) The program was effective in improving the knowledge and awareness of nurses regarding physical health hazards. (Table 2). There is a statistically significant difference in the score of the participants' knowledge in the study group about chemical health hazards over time. This indicates the positive influence of the health education program in enhancing participants' knowledge about the chemical health hazards. This finding is consistent with that of El-Bahnasawy and other <sup>(9)</sup>, who inferred that a significant improvement in the nurses' overall knowledge score was found in post-test as compared to that in pre-test. All nurses obtained a satisfactory level of knowledge after the 1<sup>st</sup> and 2<sup>nd</sup> post-tests (Table 3).

There was a statistically significant difference in the score of the participants' knowledge in the study group about biological health hazards over time. This reflects the positive influence of the health

education program in enhancing nurses' knowledge about biological health hazards. This finding is consistent with that of Arooj <sup>(10)</sup>, inferred that there was a significant improvement in nurses' knowledge of biological hazards by 86.7% after the implementation of a training program for participants (Table 4).

There was a statistically significant difference in the score of the participants' knowledge in the study group about psychological health hazards over time. This indicates the positive influence of the health education program in enhancing participants' knowledge about psychological health hazards. This finding is consistent with that of Huang <sup>(11)</sup>, who concluded that training and education put employees in a higher level of environmental control, as well as greater satisfaction with their work environment. (Table 5).

There was a statistically significant difference in the score of the participants' knowledge in the study group about mechanical health hazards over time. This reflects the positive influence of the health education program in enhancing nurses' knowledge about mechanical health hazards. This finding is consistent with that of Babatunde <sup>(12)</sup>, who concludes the HCWs knowledge of mechanical hazards was positive after training (Table 6).

**Recommendations:**

1 -There is a need to encourage, support and achieve the continuation of educational programs about occupational health hazards, at the governmental level.

2 -. It is vital to activate occupational health and safety units in the hospitals, and provide them with accurate and modern information on occupational health hazards.

3- The researcher recommended the need to develop and carry out special educational programs for nurses to enhance their knowledge regarding occupational health hazards.

**References:**

1. Park K. Park's Textbook of Preventive and Social Medicine, 18th ed., Banarsidas Bhanot, Jabalpur; .2007 1-2.
2. WHO. Occupational Health. Occupational Health (Auckl) [Internet]. 2001;228–36. Available from: <http://www.sciencedirect.com/science/article/pii/B9780433126805500239>.
3. Aluko OO, Adebayo AE, Adebisi TF, Ewegbemi MK, Abidoeye AT, Popoola BF. Knowledge, attitudes and perceptions of occupational hazards and safety practices in Nigerian healthcare workers. BMC Res Notes. 2016;9(1).
4. Amadhila J, Vyver JM Van der, Ashipala DO. Knowledge and practices among registered nurses on occupational hazards in Onandjokwe Health District: Oshikoto region, Namibia. J Hosp Adm [Internet].2017;6(4):46. Available from: <http://www.sciedupress.com/journal/index.php/jha/article/view/11528>
5. Gorman T, Dropkin J, Kamen J, Nimbalkar S, Zuckerman N, Lowe T, et al. Controlling Health Hazards to Hospital Workers: A Reference Guide. NEW Solut A J Environ Occup Heal Policy [Internet].2014;23(1\_suppl):1–169. Available from: <http://journals.sagepub.com/doi/10.2190/NS.23.Suppl>.
6. Oakley K. Occupational Health Nursing [Internet]. Vol. 4, Public Health Nursing. 2008. 71-74 p. Available from: <http://doi.wiley.com/10.1111/j.1525-1446.1987.tb00514.x>.
7. Ndejjo, R., Musinguzi, G., Yu, X., Buregyeya, E., Musoke, D., Wang, J. S., Ssempebwa, J. Occupational Health Hazards among Healthcare Workers in Kampala, Uganda. Journal of Environmental and Public Health, 2015, 1–16. <https://doi.org/10.1155/2015/913741>

8. Joshi P, Victor EM, Vasanth EM, Raghavan S, Gopichandran L. Effect of In-Service Education Workshop on Occupational Health and Safety in Terms of Knowledge and Awareness among Nurses in a Selected Tertiary Care Hospital in India: An Evaluation. *J Nurse Patient Care*. Mendeley Data, 2016; 1:1. doi:10.4172/2573-4571.1000101.
9. El-Bahnasawy MM, Mohammad AE-H, Ragab IF, Morsy TA. A Training Program for Nursing Staff on Health Hazards of Chemical Insecticides Exposure in a Practical Field. *J Egypt Soc Parasitol*. 2015 Aug;45(2):291–308.
10. Arooj Awan M, Afzal M, Iram Majeed M, Waqas A, Gilani S. Assessment of Knowledge, Attitude and Practices regarding Occupational Hazards among Nurses at Nawaz Sharif Social Security Hospital Lahore Pakistan. Vol. 3, *Saudi J. Med. Pharm. Sci*. 2017. 622 p.
11. Huang YH, Robertson MM, Chang KI. The role of environmental control on environmental satisfaction, communication, and psychological stress: Effects of office ergonomics training. *Environ Behav*. 2004;36(5):617–37.
12. Babatunde S. Perceived Occupational Health Hazards Among Health Care Workers in Government Hospitals in Ondo State. 2009; 06:1–96.