NURSES' KNOWLEDGE CONCERNING OXYGEN THERAPY TOXICITY AT MISAN GOVERNORATE HOSPITALS IN IRAQ

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ABSTRACT

Background: Oxygen therapy is a vital part in resuscitation, basic life support, acute medical care, anesthesia and postoperative care, any misconception in oxygen therapy can causes bad a patient's condition and can even be life threatening. **Objectives:** to assess knowledge level of nurses regarding oxygen therapy and to find out the relationship between knowledge level nurses and certain variables. **Methodology:** This was a descriptive, cross-sectional hospital-based study, which was conducted to assess to nurses' knowledge concerning patients' oxygen therapy toxicity at Misan hospitals in south of Iraq. The study was conducted during the period from 20th March 2020 to 25th January 2021. Non probability "purposive" sample of (100) nurses was selected from ICU, emergency unit & medical ward. **Results:** The study results show that the(51%) of study sample within (20-29) years. the majority of participants are male (60%), (49%) of them had secondary nursing school. Finally, concerning the Place of work, that the (36%) of study sample from medical ward. Nurses' knowledge regarding factors increasing susceptibility of O2 toxicity had low mean of score (1.23). Also nurses' knowledge regarding sign and symptom of O2 toxicity had low mean of score (1.31) **Conclusion:** Knowledge of nurses regarding oxygen therapy in MisanHospital is relatively very poor. The researcher recommends tospecial training program should be plan and present to all nurses that include specific standards about oxygen therapy.

I.   INTRODUCTION

O2 therapy is administered of increased oxygen to the air available for respiration to prevent hypoxia, a condition in which sufficient oxygen isn't available for the cells of the body. The administration of additional oxygen is an essential element of appropriate treatment for a wide range of clinical conditions; crossing different medical and surgical specialties'(Singh et al; 2011).

Oxygen is occupying up 65% of body mass in the human body. Oxygen plays a vital role in the human body; as it grant humans to burn food, releasing energy. Every cell in the human body needs oxygen to survive. By using mitochondria,cells turn glucose and oxygen into energy, this process called cellular respiration. cellular respiration means cells use oxygen to destroy sugar for production Adenosine Triphosphate (ATP) which is a molecule that equippting body cells with energy(Kelly & Michelle 2015, Ahmadi et al; 2016) .

Oxygen therapy is generally used in the emergency and critical situation. It is the first management in many critical conditions. Administration of oxygen depends on the needs of the patients and decision of the specialist. If oxygen therapy is given in wrong dose, it could be danger for life. patients must receive this therapy in right, safe, and comfortable way(Adipa et al., 2015;Mahmoud et al., 2016)

Maintenance of enough oxygen delivery to vital organs often needed the administration of supplemental oxygen, sometimes at high concentrations. Oxygen therapy consider a lifesaving, it may be associated with deleterious effects when given for prolonged periods at high concentrations. Oxygen should be prescribed to realize a target saturation of 94–98% for most acutely or 88–92% for those at risk of respiratory failure (Lemma, &Weldetsadik, 2015).

Oxygen therapy, similar to any drugs, if there is increasing in its dose, this can have side effects on the human body, insinuation to higher concentrations of oxygen ;can lead to dangerous health problems. The most common

serious problem could result from high oxygen concentration is oxygen toxicity, oxygen poisoning or oxygen intoxication, which mean too much oxygen in body tissues (Parke et al., 2013, Sobek, 2017).

Nishimura, 2015 remember that the oxygen toxicity is a condition resulting from long-term (over 48 hours) exposure to oxygen with high dose (over 50%), which accelerates occurrence of fibroplasias, pulmonary damage,convulsion and CNS injuries.

Nurses' knowledge is very important to identify a complexproblem involves investigating the problem etiology anddescribing signs and symptoms, it can provide the basisfor the proper nursing intervention (Arrar et. al 2019).

Furthermore, many health-care providers consider supplemental oxygen a no harmful and potentially beneficial therapy, irrespective of the presence or absence of hypoxemia (O'Driscoll et al., 2017).

So this paper is prepared to identify the level of knowledge for nursing staff regarding oxygen therapy toxicity and to find out the relationship between nurses knowledge and certain variables.

II.   METHODOLOGY

This was a descriptive, cross-sectional hospital study, which was conducted to assess to nurses' knowledge concerning patients' oxygen therapy toxicity at Misan hospitals in south of Iraq. The study was conducted during the period from 20th March 2020 to 25th January 2021. Purposive of non-probabilitysample of (100) nurses was selected for the present study. Nurses who have worked in ICU, emergency unit & medical ward.In order to assess knowledge of nurses. A questionnaire was designed and constructed by the researchers based on comprehensive review relevant literature and related studies. It is composed of two parts:

Part I: Demographic characteristic: It was consisted of (7) items which included: socio-demographical data of the sample (age, gender, years of employment, level of education,training session concerning oxygen therapy, duration of training session and place of work).

Part II: knowledge of nurses assessment tool (self-administered multiple choice), prepare by the researchers after reviewing pertinent and up-to-dated literatures from the standard international sources. The scoring system for knowledge assessment was done as following ; the correct response was scored (2) and the incorrect (1). Itis composed from:

First: A list of (7) items that deals with knowledge of nurses regarding factors that increasing susceptibility of O2 toxicity.

Second: A list of (10) items nurses' knowledge regarding sign and symptom of O2 toxicity.

Data analysis:The data of the present study were analyzed through the use of Statistical Package of Social Sciences (SPSS) version 20.The following statistical data analysis approaches were used in order to analyze and evaluate the results of the study:

Descriptive Data Analysis: Frequencies and percentand arithmetic mean and Mean of score – (MS).Mean of score (MS): A mean of score equal to (1-1.33) was beholden low MS,1.34-1.67 was moderate , greater than (1.68) was considered high MS).

Inferential Data Analysis: Chi-Square test were used for testing the relationship between level of knowledge and participant variables.

III.   RESULTS

Table (1): demographic characteristic(100) nurses:

No.	Variables	(n=100)	F	%
1-	Age (year)	20-29	51	51.0
		30-39	38	38.0
		40-49	5	5.0
		50 & more	6	6.0
		Total	100	100.0

2-	Gender	Male	60	60.0
		Female	40	40.0
		Total	100	100.0
3-	Level of education	Nursing school	0	0
		secondary nursing school	49	49.0
		Nursing institute	46	46.0
		college of nursing &above	5	5.0
		Total	100	100.0
4	Years of experience in unit	1-5	43	43.0
		6-10	25	25.0
		11-15	19	19.0
		16 & more	13	13.0
		Total	100	100.0
5	Sharing in training session concerning O2 therapy	Not sharing	54	54.0
		1-2 training session	39	39.0
		3and above	7	7.0
		Total	100	100.0
6	Duration of training session	not share	54	54.0
		less than 1 week	34	34.0
		1-2 week and	12	12.0
		3 weeks and more	0	0
7	Place of work	Medical wards	36	36.0
		Emergency	32	32.0
		ICU	32	32.0
		Total	100	100.0

No. = number ofVariable , n = number of sample, F=frequencies , % = Percentages

The results of table (1) show that the more than half of the study samplewithin (20-29) years (51%). The above table also shows that the majority of participants are male (60%).Also, regarding to the subjects level of education, the results show that (49%) of them had secondary nursing school. Less than of the half of the samples (43%) has (1-5) years of experience in unit. In regarding to the subjects sharing in training session concerning O2 therapy, more than half of the study sample (54%) not sharing in any training session. In the above table the results show that the Duration of training session less than one week (34%). Finally, concerning the Place of work, that the (36%) of study sample from medical ward.

Table2: Nurses' knowledge regarding Factors increasing susceptibility of O2 toxicity:

No	Items	Correct Answer		incorrect Answer		MS	sever
		F	%	F	%		
1	Increasing exposure to O2 longer than 48 hours is a factor lead to toxicity	14	14.0	86	86.0	1.14	L
2	Increasing depth may lead to O2 toxicity.	16	16.0	84	84.0	1.16	L
3	High a concentration of Oxygen (greater than 50%)	24	24.0	76	76.0	1.24	L
4	Exercise increasing the metabolic rate	43	43.0	57	57.0	1.43	M
5	Cold stress (Shivering is a form of exercise)	16	16.0	84	84.0	1.16	L
6	Increasing in humidity leading to o2 toxicity.	26	26.0	74	74.0	1.26	L
7	Systemic diseases that increase the metabolic rate such as thyroid diseases	25	25.0	75	75.0	1.25	L
Total						1.23	L

No. = number ofitem ,F=frequencies , % = Percentages, M.S.= mean of score. Cut-off-point interval : 1-1.33 = Low; 1.34-1.67 = Moderate; 1.67-2.00 = High, L=low, M=moderate, H=high

The finding of table (2) reveals that there is low mean of scores about nurses' knowledge regarding factors that increasing susceptibility of O2 therapy toxicity in all items less than 1.33 except item (4) shows moderate level. Moreover, the average means score (1.23) as a totally.

Table 3: nurses' knowledge regarding sign and symptom of O2 toxicity:

No	Items	Correct response		incorrect response		MS	sever
		F	%	F	%		
1	muscle twitching sign and symptom of O2 toxicity	36	36.0	64	64.0	1.36	M
2	notably facial muscles sign and symptom of O2 toxicity	45	45.0	55	55.0	1.45	M
3	O2 toxicity may causes nausea and vomiting	51	51.0	49	49.0	1.51	M
4	O2 toxicity may causes vision (tunnel vision)	36	36.0	64	64.0	1.36	M
5	hearing difficulties also sign and symptom	13	13.0	87	87.0	1.13	L
6	confusion, anxiety and a sense of impending doom are s & s of o2 toxicity.	23	23.0	77	77.0	1.23	L
7	trouble breathing is a manifestation of toxicity	16	16.0	84	84.0	1.16	L
8	Sub sternal chest pain	37	37.0	63	63.0	1.37	M
9	Non-productive cough	17	17.0	83	83.0	1.17	L
10	Nasal stuffiness & congestion are a manifestation.	36	36.0	64	64.0	1.36	M
Total						1.31	L

No. = number of item ,F=frequencies , % = Percentages, M.S.= mean of score. Cut-off-point interval : 1-1.33 = Low; 1.34-1.67 = Moderate; 1.67-2.00 = High, L=low, M=moderate, H=high

Table(3) presents that there are moderate mean of score in items (1,2,3,4,8,10) about nurses' knowledge regarding sign and symptom of O2 toxicity In addition, the study sample implementation demonstrates low in items number (5,6,7, 9). However the average of means score (1.31).

Table 4: Association between the level of Nurses' knowledge and their demographic:

variables	Level of knowledge for Nurses				Sign.
	χ^2obs	χ^2crit.	d.f	p-value	
Age	**28.426**	**12.59**	**6**	**0.00**	Sign.
Gender	4.69[a]	5.99	2	**0.096**	Non-Sign
Level of education	**18.37**	**9.49**	4	**0. 001**	Sign.
Years of employment	**14.958**	**12.59**	6	**0. 021**	Sign.
Sharing in training session	**10.66**	**9.49**	4	**0. 031**	Sign.
Duration of training session	**13.96**	**9.49**	4	**0. 007**	Sign.
Place of work	**0.949**	**9.49**	4	**0. 917**	Non-Sign

χ^2obs. = chi-square observed, χ^2crit= chi-square critical , df= degree of freedom, p = probability value

The data analysis appeared in table (4) shows that there weren't a significant relationship between nurses knowledge toward oxygen therapy toxicity with gender and place of work at **(P< 0.05),** when analyzed by chi-square test. Also this table revels there were a significant relationship between nurses' knowledge toward oxygen therapy toxicity with (age, years of employment, level of education, training session concerning oxygen therapy and period of training session)

IV. DISCUSSION

-Demographic characteristics of Nurses for Study Sample: Out of the data analysis distribution of socio-demographic variables, table (1) show that the more than half of the study sample are within age group (20-29) years (51%). This result seems to be agrees with (Mahmoud, et al., 2016), who showed that the majority (70%) of his study sample were within age group (25-40) yrs. The same table also shows that the majority of participants are male (60%).Also, regarding to the subjects level of education, the results show that (49%) of them had secondary nursing school. Less than of the half of participants (43%) has (1-5) years of experience in unit. most of nurses variables in this study included in research prepared by (Mayhob, 2018) this study appeared that the (88%) of here sample were female. Also she demonstrated that the (70%) have technical institute of nursing & (66%) have less (10 years) of years of experience in unit.

In regarding to the subjects sharing in training session concerning O2 therapy, more than half of the study sample (54%) not sharing in any training session. Table(1) revels the results show that the duration of training session less than one week (34%).sharing in training session and continuously education for nurses are very important to enable him to introducing good nursing care(Andrews,2008).

Finally, concerning the Place of work, that the(36%) of study sample from medical ward.This study agree with finding by (Mayhob, 2018) who concluded that (78%) working in critical care units.

In regarding to nurses' knowledge regarding factors increasing susceptibility of O2 toxicity, the finding of table (2) demonstrate that there is low mean of scores about nurses' knowledge regarding factors that increasing susceptibility of O2 therapy toxicity in all items less than 1.33 except item (Exercise increasing the metabolic rate) shows moderate level. Moreover, the average means score (1.23) as a totally.

This results agree with study (Mohamudet.al., 2016) who studied in ElmakNimir university hospitalassessment of knowledge and practice of nurses regarding oxygen therapy which concluded that Knowledge and practice of nurses regarding oxygen therapy in ElmakNimir University Hospital. This study demonstrated that the knowledge relatively poor.

Nurses' knowledge regarding sign and symptom of O2 toxicity presented in table (3) as a moderate mean of score in items (1,2,3,4, 8,10) about nurses' knowledge regarding sign and symptom of O2 toxicity In addition, the study sample implementation demonstrates low in items number (5,6,7,9). However the average of means score (1.31).the finding is supported by the study (Mayhob, 2018) reported that nurses' knowledge, practices and barriers affecting a safe administration of oxygen therapy , which represents that, 76%, of the studied sample had unsatisfactory level of knowledge in relation to administering oxygen therapy. While, only 6% and 18% of the studied sample have satisfactory and average levels of knowledge regarding administering oxygen therapy respectively

Discussion of association between Nurses` knowledge level and certain variables (age, gender, level of education, years of employment, training session concerning oxygen therapy, duration of training session and place of work), Table (4) indicates that there were significant relationship between Nurses' knowledge regarding oxygen therapy toxicity with their(age, level of education, years of employment, training session concerning oxygen therapy and duration of training session) at (P< 0.05), The current study is supported by (Radhi, 2015) who presented that there is strong relationship between nurses knowledge with some demographic of participants in his study.This result agrees with Evaluation of adherence to oxygen therapy standards before, during and after oxygen hood administration which conducted by (**Kord** and Salhi, 2015) who showed there is a significant relationship was observed between the nurses' oxygen therapy care performance and their age (P=0.001) and occupational experience in NICU (P=0.001).

Also this result agrees with a study done by (Lewis, 2011) who concluded that the level of education is very important in nurses' knowledge. Also this finding is supported by that of Goharani et al., (2017) who currently indicated that, all health team members specially nurses should be given specific attention to written prescription rather than oral order for oxygen therapy, as well, prescribing right oxygen dose, right devices according to the patient's condition, right flow rate, and right monitoring method for patient's oxygen saturation in order to maintain proper oxygen therapy for patient.

Data that presented in table (4) shows that there wasn't a significant relationship between nurses knowledge toward oxygen therapy toxicity and (gender-place of work).this result disagreement with study conducted by (Manja& Lakshmi,2016) whommentioned that, gender and work place has significance effect on nurses' knowledge level.

Based on the results of this study, the researcher recommends tospecial training sessions should be design and present to all nurses that include specific training programs about oxygen therapy toxicity. Authorizing and distributing a manual handbook or pamphlet or poster to all nurses who work in any unit that uses oxygen therapy. Training session should be specific and it duration more than (1) week. The educational opportunities provided to medical department nurses with knowledge and practices base enable them to assess, plan, implement and evaluate individualized care.

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