

# Effectiveness of Instructional Program for Nurses' Knowledge regarding Oxygen Administration Methods at Pediatric Teaching Hospitals in Mosul City

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## Abstract

**The Objective:** To evaluate the effectiveness of instructional program for nurses' knowledge regarding oxygen administration methods at pediatric teaching hospitals in Mosul City.

**The Methodology:** A quasi-experimental study was applied at pediatric teaching hospitals in Mosul City from 21 of October/ 2018 till 17 of July / 2019. The selection of the sample was using the non- probability (Purposive) sample that chosen for the current study. The total study sample consisted of (52) nurses, (26) nurses working in the Al-Kansaa Teaching Hospital and (26) nurses working Ibn Al-Atheer Teaching Hospital from Mosul City. The program lectures and questionnaire were constructed and provided for nurses to evaluate the effect of the instructional program on nurse's knowledge. The Pearson's coefficient of correlation result are ( $r= 0.756$ ) and are significant at  $p \leq 0.05$  level was used to estimate the scale (test – retest) by using SPSS version 25.

**Results** shows that statistical differences (paired samples t-test) of the knowledge for the study and control group concerning the oxygen administration methods for pediatric. There are high significant relationships between pre-test and post-test result for study group. But are not significant relationships between pre-test and post-test result for control group at  $P.value \leq 0.05$  levels.

**Keywords:** *Instructional Program, Nurses' knowledge, Oxygen Administration Methods.*

## Introduction

The oxygen is fundamental for living. Barely any organs like heart, mind, and kidney need high measures of oxygen for their survival dependent on their cell necessity, the condition of oxygen may be deferent in many cases such as infection, exercises, increase metabolism and injury; the body well not has a store of oxygen<sup>1</sup>. Undoubtedly, O<sub>2</sub> treatment could be a very important tool and has saved many lives and improved others, however, number eight treatment risk, cost, and edges have to be compelled to be thought-about inside an equivalent suggests that as medicine and titrated to a measured end purpose to avoid excessive or inadequate dosing, withholding number eight can have a damaging effect; nevertheless continuing to produce O<sub>2</sub> treatment once it's not indicated will prolong hospitalization and increase the value of care, this comprehensive review

begins with complete assessment and evaluation the effects of physiological, toxicities potential, and customary delivery procedures<sup>2</sup>. Also that represents as a routine treatment procedure in pediatric hospitals, has principal objectives such as reducing the child patient's respiratory and cardiac workload, also increasing heart rate, alveolar pressure and hemodynamic competence, preventing hypoxia or hypoxemia and mortality<sup>3</sup>.

## Material and Methods:

**Design of the study:** An experimental study design for two groups, study and control group (pretest-posttest) carried out at medical ward of pediatric teaching hospitals in Mosul city to evaluate the effect of the instructional program on nurse's knowledge regarding oxygen administration methods at pediatric teaching hospitals from 21 of October/ 2018 till 17 of July / 2019

**Sample of the study:** the selection of the sample was using the non- probability (Purposive) sample that chosen for the current study. The total study sample consisted of (52) nurses, (26) nurses working in the Al-Kansaa Teaching Hospital and (26) nurses working Ibn Al-Atheer Teaching Hospital from Mosul City.

**Study tool:** The program lectures and questionnaire were constructed and provided for nurses to evaluate the effect of the instructional program on nurse's knowledge regarding oxygen administration methods. The program lectures was contain five lecture, two lecture each week, and The questionnaire was contain two parts, first part concerns the demographic information, while another part was contained the nurses' knowledge regarding oxygen administration methods and contains five sections. The estimate evaluation of the nurses' knowledge are failure = (0-1) answer knowledge score, not acceptable = (2) answer knowledge score, acceptable

= (3) answer knowledge score, good = (4) answer knowledge score, Excellent = (5) answer knowledge score. But the estimate for total knowledge are failure = (0-5) answer knowledge score, not acceptable = (6-10) answer knowledge score, acceptable = (11-15) answer knowledge score, good = (16-20) answer knowledge score, excellent = (21-25) answer knowledge score.

**Validity of the study:** The validity of the program lectures and questionnaire tool was established through a panel of experts whom specified the content clarity, relevancy, and adequacy.

**Data collection:** The data were collected from pediatric teaching hospitals in Mosul City. The study sample consisted of (52) nurses, (26) nurses working in the Al-Kansaa teaching hospital and (26) nurses working Ibn Al-Atheer teaching hospital, the period from 13 of January till 26 of February / 2019.

## Result

**Table (1): Statistical Knowledge Results for Study and Control Group Nurse's in Concerning the Oxygen Administration Methods for Pediatric**

Knowledge	Estimate	Study Group				Control Group			
		Pre-test		Post-test		Pre-test		Post-test	
		F.	%	F.	%	F.	%	F.	%
General knowledge and purpose or aim of use	Fail	0	0.0	0	0.0	1	3.8	7	26.9
	Not Acceptable	15	57.7	0	0.0	15	57.7	11	42.3
	Acceptable	8	30.8	3	11.5	10	38.5	7	26.9
	Good	3	11.5	8	30.8	0	0.0	1	3.8
	Excellent	0	0.0	15	57.7	0	0.0	0	0.0
The normal values and nursing consideration	Fail	18	69.2	0	0.0	19	73.1	19	73.1
	Not Acceptable	7	26.9	0	0.0	7	26.9	5	19.2
	Acceptable	1	3.8	5	19.2	0	0.0	2	7.7
	Good	0	0.0	17	65.4	0	0.0	0	0.0
	Excellent	0	0.0	4	15.4	0	0.0	0	0.0
The clinical manifestation of the children during oxygen administration	Fail	9	34.6	0	0.0	10	38.5	11	42.3
	Not Acceptable	12	46.2	0	0.0	15	57.7	13	50.0
	Acceptable	5	19.2	9	34.6	1	3.8	2	7.7
	Good	0	0.0	14	53.8	0	0.0	0	0.0
	Excellent	0	0.0	3	11.5	0	0.0	0	0.0

**Cont... Table (1): Statistical Knowledge Results for Study and Control Group Nurse’s in Concerning the Oxygen Administration Methods for Pediatric**

Influencing factors and methodology for selecting the appropriate method	Fail	18	69.2	0	0.0	20	76.9	17	65.4
	Not Acceptable	6	23.1	0	0.0	6	23.1	6	23.1
	Acceptable	2	7.7	6	23.1	0	0.0	3	11.5
	Good	0	0.0	16	61.5	0	0.0	0	0.0
	Excellent	0	0.0	4	15.4	0	0.0	0	0.0
The oxygen humidification and complications of oxygen using	Fail	8	30.8	0	0.0	11	42.3	9	34.6
	Not Acceptable	15	57.7	0	0.0	15	57.7	16	61.5
	Acceptable	3	11.5	8	30.8	0	0.0	1	3.8
	Good	0	0.0	11	42.3	0	0.0	0	0.0
	Excellent	0	0.0	7	26.9	0	0.0	0	0.0
The Total		26	100.0	26	100.0	26	100.0	26	100.0

**Failure** = (0-1) answer knowledge score, **Not acceptable** = (2) answer knowledge score, **Acceptable** = (3) answer knowledge score, **Good** = (4) answer knowledge score, **Excellent** = (5) answer knowledge score. F=Frequency, %= percentage

The table (1) shows the statistical knowledge results for study group nurse’s in concerning the oxygen administration methods for pediatric, that general knowledge and purpose or aim of use in pre-test are

57.7% (15) of them at not acceptable level, Post-test are 57.7 % (15) of the at excellent level. The normal values and nursing consideration in pre-test are 69.2% (18) of them at fail level, post-test are 65.4% (17) of them at good level. The clinical manifestation of the children during oxygen administration in pre-test are 46.2% (12) of them at not acceptable level, post-test are 53.8% (14) of them at good level.

**Table (2): Statistical Total Knowledge Results for Study and Control groups in Concerning the Oxygen Administration Methods for Pediatric**

	Knowledge	Estimate	Pre-test		Post-test	
			F.	%	F.	%
1.	Study group	Fail	2	7.7	0	0.0
		Not Acceptable	21	80.8	0	0.0
		Acceptable	3	11.5	0	0.0
		Good	0	0.0	13	50.0
		Excellent	0	0.0	13	50.0
2.	Control group	Fail	3	11.5	7	26.9
		Not Acceptable	23	88.5	18	69.2
		Acceptable	0	0.0	1	3.8
		Good	0	0.0	0	0.0
		Excellent	0	0.0	0	0.0
The Total			26	100.0	26	100.0

**Failure** = (0-5) answer knowledge score, **Not acceptable** = (6-10) answer knowledge score, **Acceptable** = (11-15) answer knowledge score, **Good** = (16-20) answer knowledge score, **Excellent** = (21-25) answer knowledge

score. F=Frequency, %= percentage

The table (4) shows the statistical total knowledge results for study and control groups in concerning the oxygen administration methods for pediatric. That the study group at pre-test are 80.0% (21) of them at not

acceptable level, post-test are 50.0% (13) of them at excellent and good level. But the control group in pre-test is 88.5 % (23) of them at not acceptable level, post-test are 69.2% (18) of them at not acceptable level.

**Table (3): Statistical Differences (Paired Samples t-test) of the Knowledge for the Study and Control group Concerning the Oxygen Administration Methods for pediatric**

Groups	The Test	Mean	Std. D.	t	P.value	Sig
Study Group	Pre - Post	-2.462	0.706	-17.778	<b>0.000</b>	<b>S</b>
Control Group	Pre - Post	0.115	0.588	1.000	0.327	NS

Std. D. = Standard Deviation, t=t-test, Sig=Significant at P.value ≤ 0.05 level

The table (3) presents the statistical differences (paired samples t-test) of the knowledge for the study and control group concerning the oxygen administration methods for pediatric. There are high significant relationships between pre-test and post-test result for study group. But are not significant relationships between pre-test and post-test result for control group at P.value ≤ 0.05 levels.

**Table (4): Statistical Differences (ANOVA - Pairwise Comparison) for constructional program (Pre-test, Post-test) between the Study and Control Groups Concerning the Oxygen Administration Methods for Pediatric**

Dependent Variable	Groups	Mean	P.value	Sig
Pre-test	Study Group	2.038	0.161	NS
	Control Group	1.885		
Post -test	Study Group	4.500	0.000	S
	Control Group	1.769		

Multiple comparisons: Bonferroni ANOVA is significant at P.value ≤ 0.05 level

The table (4) shows the statistical differences (ANOVA - pairwise comparison) for constructional program (pre-test, post-test) between the study and control groups concerning the oxygen administration methods for pediatric. There are not significant

relationships between study group and control group result for pre-test. But there are high significant relationships between study group and control group result for post-test at P.value ≤ 0.05 levels

**Table (5): Statistical Relationships of the Study between the Demographic Variables of Nurses and Results of the Constructional Program**

	The Demographic Variables	Study Group			
		Pre		Post	
		P.value	Sig.	P.value	Sig.
1.	Age	0.69	NS	0.51	NS
2.	Gender	0.64	NS	1.00	NS
3.	Level of education	0.72	NS	0.10	NS
4.	General employments period	0.36	NS	0.82	NS
5.	The period of working in the current hospital	0.05	NS	0.72	NS
6.	Training courses	0.74	NS	0.44	NS
7.	Reading Source	0.64	NS	0.13	NS
	The Demographic Variables	Control Group			
		Pre		Post	
		P.value	Sig.	P.value	Sig.
1.	Age	0.03	S	0.19	NS
2.	Gender	0.07	NS	0.46	NS
3.	Level of education	0.22	NS	0.70	NS
4.	general employments period	0.03	S	0.04	S
5.	the period of working in the current hospital	0.20	NS	0.26	NS
6.	training courses	0.80	NS	0.61	NS
7.	Reading Source	0.33	NS	0.74	NS

Relationship is significant at P.value ≤ 0.05 level

The table (5) presents statistical relationships of the study between the demographic variables of nurses and results of the constructional program. There are not significant relationships between study group result (pre-test and post-test) with all demographic variables except the pre-test with the period of working in the current hospital and not significant relationships with other demographic variables. The control groups in pre-test are significant relationships with age and general employments period only, but the post-test are significant relationships with general employments period only and not significant relationships with other demographic

variables.

### Discussion

The table (1) shows the statistical knowledge results for study group nurse’s in concerning the oxygen administration methods for pediatric, that general knowledge and purpose or aim of use in pre-test are 57.7% (15) of them at not acceptable level, Post-test are 57.7 % (15) of the at excellent level. The normal values and nursing consideration in pre-test are 69.2% (18) of them at fail level, post-test are 65.4% (17) of them at good level. The clinical manifestation of the children

during oxygen administration in pre-test are 46.2% (12) of them at not acceptable level, post-test are 53.8% (14) of them at good level. The Influencing factors and methodology for selecting the appropriate method in pre-test are 69.2% (18) of them at fail level, post-test are 61.5% (16) of them at good level. The oxygen humidification and complications of oxygen using in pre-test are 57.7 % (15) of them at not acceptable level, post-test are 42.3% (11) of them at good level. This result disagree with Kanaka R and Padma K (2016) that shows among 30 sample of nursing students 5 (16.7%) have inadequate knowledge, 15 (50%) have moderately adequate knowledge regarding and, 10 (33.3%) have adequate knowledge regarding pediatric oxygenation<sup>11</sup>. The table (2) shows the statistical total knowledge results for study and control groups in concerning the oxygen administration methods for pediatric. That the study group at pre-test are 80.0% (21) of them at not acceptable level, post-test are 50.0% (13) of them at excellent and good level. But the control group in pre-test is 88.5 % (23) of them at not acceptable level, post-test are 69.2% (18) of them at not acceptable level.

The table (3) presents the statistical differences (paired samples t-test) of the knowledge for the study and control group concerning the oxygen administration methods for pediatric. There are high significant relationships between pre-test and post-test result for study group. But are not significant relationships between pre-test and post-test result for control group at P.value  $\leq 0.05$  levels. The table (4) shows the statistical differences (ANOVA - pairwise comparison) for constructional program (pre-test, post-test) between the study and control groups concerning the oxygen administration methods for pediatric. There are not significant relationships between study group and control group result for pre-test. But there are high significant relationships between study group and control group result for post-test at P.value  $\leq 0.05$  levels. The table (5) presents statistical relationships of the study between the demographic variables of nurses and results of the constructional program.

### Conclusion

1. The nurses of the pediatric teaching hospital in Mosul city do not have appropriate and adequate knowledge regarding the oxygen administration

methods.

2. There is a significant relationship between the pre-test and post-test results of the study group regarding the oxygen administration methods knowledge.

3. Effectiveness of the Instructional program is proved through the high significant relationship of the nurse's knowledge between the study and control groups regarding the oxygen administration methods knowledge.

4. There is no significance correlation between the nurses' knowledge and all demographic characteristics except the general employments period and age of the study group nurses

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**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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