

# Effectiveness of Educational Program Regarding the Integrated Management of Neonatal and Childhood Illness on Nurses Practices in Holy Karbala

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## Abstract

Background: Integrated management of neonatal and childhood illnesses (IMNCI) is a number of guidelines build up by the World Health Organization (WHO) in 1992 to improve the assessment, classification, and the individual management of the common causes of death among children under the age of five (Jibo et al., 2014). The development of the IMCI strategy was based on three main components, improving the performance of health care providers, enhancing the performance and management structure of the health system and strengthening family and community practices (Carai et al., 2019). Objectives: To evaluate the impact of educational program regarding the integrated management of neonatal and childhood illness on nurses practices. Methodology: A quantitative study (quasi-experimental design) carried out for achieving the objectives of present study, by application of pretest- posttest approach for both study and control groups about nurses working in IMNCI units from 20th September 2020 to 25th April 2022. The study is conducted in the primary health care centers of the four health care sectors in Holy Karbala. Non probability sample (purposive sample) from the total population who meet the criteria of the study during the study interval. A total of (60) nurses selected for the study, (30) participant for study group and (30) for control group. Results: The mean age of study group was  $33.5 \pm 8.1$  years and that of control was  $32.8 \pm 8.8$  years, while males were dominant in study group and controls represented 63.3% and 70%, respectively. Vast majority of the participants, 90%, in the study group and 80% of controls were married. In regard educational achievement (66.7%) and (76.7%) of (study group and control) had achieved nursing institute level of education. Comparison of overall mean practice scores of study group and controls for all domains revealed no significant difference in mean scores before education program (pretest) between both groups, ( $P > 0.05$ ), a highly significant differences in means score at post-test (1) and post-test (2), at ( $P < 0.001$ ). Within each group, it had been found that the change in overall Practice scores increased significantly in the study group where the overall mean score for all domains increased from  $2.21 \pm 0.20$  before education program to  $2.76 \pm 0.09$  at posttest 1 and almost maintained to  $2.75 \pm 0.11$  at posttest 2, with a mean difference of 0.54 and a percentage change of 24.4%, the change was highly significant, ( $P < 0.001$ ). In control group, the change was statistically insignificant where the mean score before education was  $2.29 \pm 0.17$ , at posttest 1 was  $2.30 \pm 0.16$  and at posttest 2 it was  $2.31 \pm 0.16$  with a mean difference of only 0.02 and the percentage change was 0.9%, ( $P > 0.05$ ). Conclusion: Significant improvement appear clearly among the interventional group member through the result of their pre-test and post-test, which explain the effectiveness of the reinforcement educational program session content on the nurses' practices.

**Keywords:** Effectiveness, IMNCI, Practices

## 1. Introduction

According to IMNCI strategy, providing high-quality care to children is a significant task. In response to this issue, WHO/UNICEF created an IMCI approach that included evidence-based assessment and treatment of the primary causes of childhood diseases, including diarrhea, pneumonia, malaria, and malnutrition, as well as increasing caregiver awareness about home care practices (Yasin et al., 2016).

The IMNCI plan is implemented in Iraq since 1998, with the goal of addressing the leading causes of under-five mortality and morbidity through a comprehensive approach aligned with primary

health care policy. The planning time for IMCI implementation (1998-2004) was inadequate, and it varied until the second part of 2004. The start of the year 2005 was deemed the official date of the launch (Sharhan & Ali Ma'ala, 2021). Nurses with limited training can utilize IMNCI strategies for assessing, classifying and treating the children under five years of age. The aim of IMNCI is promoting the growth and development among children under five years which results in reducing illness targeting the most causes of childhood death (Hussein & Farhood, 2019). Developing countries suffer from more than 12 million child death before they reach the age of five year, the majority of them die in their first year. Seven out of ten of these deaths are caused by one of five diseases: diarrhoea, acute respiratory

infections (including pneumonia), malnutrition, malaria and management of critically ill children are among the illnesses that are managed from the time a child is one week old to five years old (Adekanye & Odetola, 2014). The IMNCI training courses were originally 11 days long, but in a number of countries and locations, they have been condensed to seven or eight days. (Sharhan & Ma'ala, 2021).

## 2. Objectives of the Study are

1. To determine the effectiveness of an educational program on nurses' practices regarding IMNCI.
5. To find out the relationship between the sample level of practices at pre-test and post-test program and some their sociodemographic variables.

## 3. Methodology

Quazi-experimental study designed and carried out for achieving the objectives of present study, by application of pre-test and post-test approach for both study and control group about nurses working in IMNCI units from 20<sup>th</sup> September 2020 to 25<sup>th</sup> April 2022. The study is conducted in the primary health care centers of the four health care sectors in Holy Karbala health department and the public health department in Holy Karbala. Non probability sample (purposive sample) from the total population who meet the criteria of the study during the study interval. A total of (60) nurses selected for the study,

(30) participant selected for study group and (30) were selected for control group. Specific questionnaire prepared to collect the data by interview method. After an intensive review of literatures, assessment needs of the study and the researcher constructed the instrument which consists of (two) components and total of (44) items.

## 4. Data Collection

Self-administration approach used to answer the instrument to collect the data for the period 23 January 2021. The implementation of the reinforcement educational program completely and data collection conducted in the period (23 January 2022 to 31 March 2022) and required (5) lectures for 3 hours per day to implement. The pretest data collection conducted before beginning the implementation of the program, the post-test (1) data collection applied after implementation of the education program directly. The post-test (2) data collected after one month of the post-test (1) data collection. The nurses participated after taking their agreement, the nurses needed (25- 30) minutes to complete all items of questionnaire. All participant of study (60) is exposed to pre-test. The educational program given to all study group (30) nurses who work in IMNCI units.

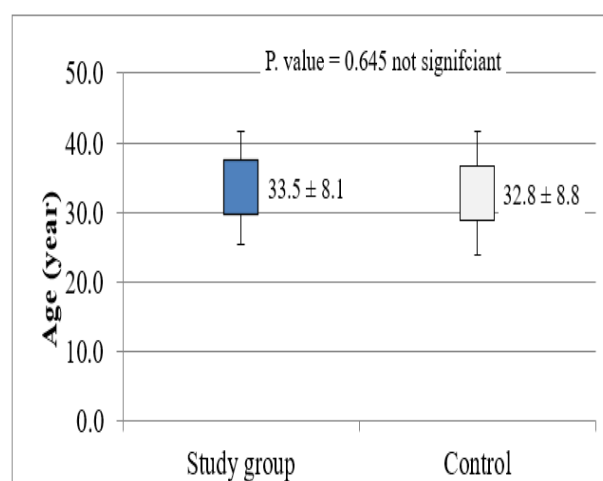
## 5. Results

**Table 1. Baseline demographic characteristics of the studied groups**

Variable		Study group (n=30)		Control (n=30)		P. value
		No.	%	No.	%	
Gender	Female	19	63.3	21	70.0	0.534 ns
	Male	11	36.7	9	30.0	
Marital Status	Married	27	90.0	24	80.0	0.397 ns
	Single	3	10.0	4	13.3	
	Widowed	0	0.0	2	6.7	
Residency	Urban	18	60.0	15	50.0	0.604 ns
	Rural	12	40.0	15	50.0	
Educational Achievement	Nursing Secondary School	8	26.7	6	20.0	0.657 ns
	Nursing Institute	20	66.7	23	76.7	
	Nursing College	2	6.7	1	3.3	

ns: no significant difference

A total of (30) participants were enrolled in the education program of the study in addition to (30) participants who did not participate in the program as control group. Males were dominant in study group and controls represented 63.3% and 70%, respectively. Vast majority of the participants, 90%, in the study group and 80% of controls were married. In the study group, 60% of urban residency, 26.7% had nursing secondary school level, 66.7% had achieved nursing institute level of education, the corresponding proportions of these levels in control group were 20%, 76.7% and 3.3%, respectively. In all comparisons of these variables, no statistically significant differences were found between study group and controls, (P. value > 0.05) (Table 1).



**Figure 1. Comparison of the studied groups according to age**

The mean age of study group was  $33.5 \pm 8.1$  years and that of control was  $32.8 \pm 8.8$  years (Figure1).

**Table 2. Number of participation and duration of IMNCI courses of the studied groups**

Variable		Study group (n=30)		Control (n=30)		P. value
		No.	%	No.	%	
Number of participations in IMNCI courses	None	17	56.7	15	50.0	0.504 ns
	One course	7	23.3	11	36.7	
	Two or more	6	20.0	4	13.3	
Duration of Courses in IMNCI	None	17	56.7	15	50.0	0.795 ns
	7 days	13	43.3	15	50.0	
	8 days and more	0	0.0	0	0.0	
Years of Employment	1-3	0	0.0	2	6.7	0.631 ns
	4-6	11	36.7	10	33.3	
	7 and more	19	63.3	18	60.0	

In the study group, 17 participants (56.7%), did not participate previously in IMNCI courses. Among controls, 15 participants (50%) did not participate in IMNCI training courses. The duration of all IMNCI

training courses was 7 days, with no significant difference between both groups in number or duration of IMNCI training courses, (P. value > 0.05) (Table 2).

**Table 3. Comparison of History taking practice score of study group and controls before and after education program**

	Study group		Control		P. value (student's t test)
	Mean	SD	Mean	SD	
Pretest	2.28	0.23	2.32	0.19	0.435 ns
Posttest 1	2.84	0.09	2.33	0.18	<0.001 sig
Posttest 2	2.83	0.09	2.34	0.18	<0.001 sig
Mean Difference	0.55	0.02	0.02	0.00	<0.001 sig
Percentage change	24.3%	7.9%	0.9%	0.5%	
P. value within group (repeated measures ANOVA)	<0.001 sig		0.153 ns		

Comparison of mean practices score for study group and controls regarding the practice about history taking before and after education program revealed no significant difference in mean scores before education program between study group and controls, (P>0.05), a highly significant differences in means score at post-test (1) and post-test (2), at (P<0.001). The change in practice scores regarding

history taking increased significantly in the study group where the overall mean score increased from 2.28 before education program to 2.84 at post-test (1) and almost maintained to 2.83 at post-test (2), with a mean difference of 0.55 and a percentage change of 24.3%, the change was highly significant, (P<0.001). As shown in (Table 3).

**Table 4. Comparison classification of cases practice score of study group and controls before and after education program**

Classification of cases	Study group		Control		P. value (student's t test)
	Mean	SD	Mean	SD	
Pretest	2.00	0.31	2.13	0.21	0.071 ns
Posttest 1	2.64	0.19	2.15	0.38	<0.001 sig
Posttest 2	2.64	0.21	2.15	0.38	<0.001 sig
Mean Difference	0.64	0.02	0.02	0.00	<0.001 sig
Percentage change	32%	6.9%	0.9%	0.5%	
P. value within group (repeated measures ANOVA)	<0.001 sig		0.159 ns		

Regarding classification of cases before and after education program revealed no significant differences in means score before education program between study group and controls, (P>0.05), a highly significant differences in mean scores at post-test (1) and post-test (2), at (P<0.001). The change in practice scores regarding

classification of cases increased significantly in the study group from 2.00 before education program to 2.64 at post-test (1) and maintained at 2.64 at post-test (2), with a mean difference of 0.64 and a percentage change of 32%, the change was highly significant, (P<0.001). (Table 4).

**Table 5. Comparison nutrition and feeding practice score of study group and controls before and after education program**

Nutrition and feeding	Study group		Control		P. value (student's t test)
	Mean	SD	Mean	SD	
Pretest	2.16	0.43	2.27	0.30	0.085 ns
Posttest 1	2.69	0.25	2.28	0.30	< 0.001 sig
Posttest 2	2.69	0.33	2.29	0.30	< 0.001 sig
Mean Difference	0.53	0.02	0.02	0.00	< 0.001 sig
Percentage change	24.5%	7.8%	0.9%	0.5%	
P. value within group (repeated measures ANOVA)	<0.001 sig		0.157 ns		

Regarding the practices about nutrition and feeding before and after education program revealed no

significant difference in mean scores before education program between study group and

controls, ( $P>0.05$ ), a highly significant differences in means score at post-test (1) and post-test (2), at ( $P<0.001$ ). The change in practice scores regarding nutrition and feeding increased significantly in the study group where the overall mean score increased

from 2.16 before education program to 2.69 at post-test (1) and maintained at 2.69 at post-test (2), with a mean difference of 0.53 and a percentage change of 24.5%, the change was highly significant, ( $P<0.001$ ). As shown in (Table 5).

**Table 6. Comparison counseling practice score of study group and controls before and after education program**

Counseling	Study group		Control		P. value (student's t test)
	Mean	SD	Mean	SD	
Pretest	2.42	0.21	2.49	0.19	0.167 ns
Posttest 1	2.86	0.12	2.49	0.19	<0.001 sig
Posttest 2	2.83	0.16	2.51	0.21	<0.001 sig
Mean Difference	0.41	0.01	0.02	0.001	<0.001 sig
Percentage change	17.1%	6.5%	0.5%	0.6%	
P. value within group (repeated measures ANOVA)	<0.001 sig		0.317 ns		

In regard the practices about counseling before and after education program revealed no significant difference in mean scores before education program between study group and controls, ( $P>0.05$ ), a highly significant differences in means score at post-test (1) and post-test (2), at ( $P<0.001$ ). Within each group, it had been found that the mean practice scores regarding counseling increased significantly in the study group where the overall mean score increased

from 2.42 before education program to 2.86 at post-test (1) and maintained at 2.83 at post-test (2), with a mean difference of 0.41 and a percentage change of 17.1%, the change was highly significant, ( $P<0.001$ ). In control group, the change was statistically insignificant where the mean difference was only 0.02 and the percentage change was only 0.9%, ( $P>0.05$ ). As shown in (Table 6).

**Table 7: Comparison overall practice score for all domain of study group and controls before and after education program**

	Study group		Control		P. value (student's t test)
	Mean	SD	Mean	SD	
Pretest	2.21	0.20	2.29	0.17	0.095 ns
Posttest 1	2.76	0.09	2.30	0.16	<0.001 sig
Posttest 2	2.75	0.11	2.31	0.16	<0.001 sig
Mean Difference	0.54	0.02	0.02	0.001	<0.001 sig
Percentage change	24.4%	9.1%	0.9%	0.7%	
P. value within group (repeated measures ANOVA)	<0.001 sig		0.150 ns		

Comparison of overall mean practice scores of study group and controls for all domains revealed no significant difference in mean scores before education program (pretest) between both groups, ( $P>0.05$ ), a highly significant differences in means score at post-test (1) and post-test (2), at ( $P<0.001$ ). Within each group, it had been found that the change in overall practices scores increased significantly in the study group where the overall mean score for all domains increased from  $2.21 \pm 0.20$  before education program to  $2.76 \pm 0.09$  at

post-test (1) and almost maintained to  $2.75 \pm 0.11$  at post-test (2), with a mean difference of 0.54 and a percentage change of 24.4%, the change was highly significant, ( $P<0.001$ ). In control group, the change was statistically insignificant where the mean score before education was  $2.29 \pm 0.17$ , at posttest 1 was  $2.30 \pm 0.16$  and at posttest 2 it was  $2.31 \pm 0.16$  with a mean difference of only 0.02 and the percentage change was 0.9%, ( $P>0.05$ ). The comparisons are summarized in (Tables 7 & Figure 2).

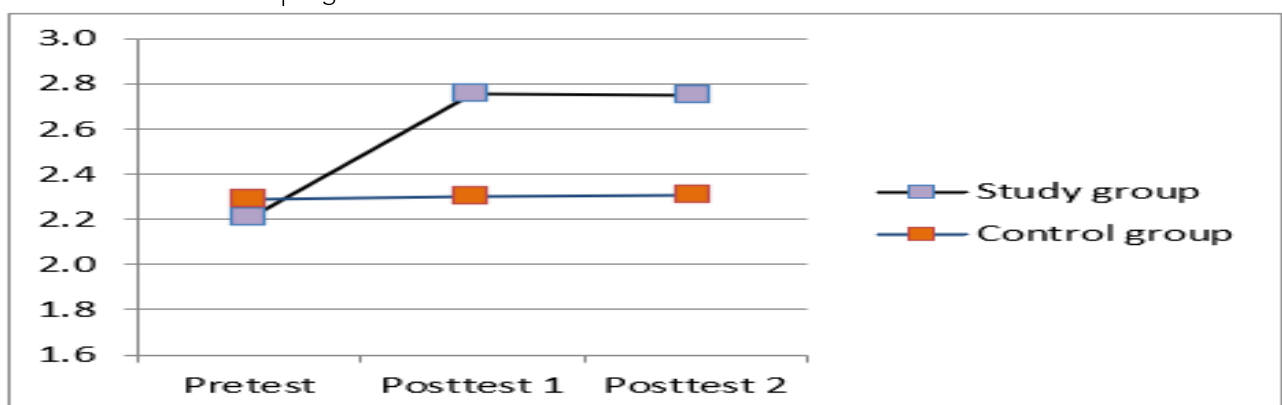


Figure 2: Line-Marker graph comparing the change in overall practice score of study group and controls

**Table 8: Results of bivariate correlation analysis between demographic characteristics of study group and change in practice score after education program**

	Correlation with Change in Practice	
	Correlation coefficient (R)	P. value
Age (Year)	-0.781	<0.001
Gender	0.488	0.006
Marital Status	0.211	0.264
Educational Achievement	-0.312	0.093
Residency	0.016	0.933
Number of participations in IMNCI courses	0.079	0.676
Duration of Courses in IMNCI	0.055	0.77
Years of experience in IMNCI unit	0.213	0.259
Years of Employment (year)	0.57	0.001

Regarding association with change in practice scores after implementing the education program, age, gender and years of employment showed significant effect on the change in practice scores after education program in the study group, r value was -0.781, 0.488 and 0.570, respectively, P. value <0.05, (Tables)

## 6. Discussion

The results of the present study showed that the majority of the study group and control group 19 (63.3%), 21(70%) respectively are female. Nurses working in IMNCI units are dealing with children less than 5 which are brought by their mothers so the presenting of female nurses making the communication and the child management more easily, also the community's view for nursing profession differed from the previous one, and the profession became more popular for both genders, this result something popular with a study done by (Muhaisen et al., 2021) in Babylon city which revealed that majority of the study group was female, while (Seid & Sendo, 2018) found that 131(70.8%) participants were male. In regard of marital status majority of both study group and control group were married this result is something popular as most nurses are employed and earning some enough budget so they have the opportunity to marry, while regarding residency the finding of this study found that majority of the study group (60.0%) were urban residence this results comes along with (Hussein & Farhood, 2019) which found that most prevalence of the study sample in Babylon were married (82%), while (Muhaisen et al., 2021) found that most of the participants (96.2%) in Babylon were urban residency.

Regarding educational achievement the majority of the study sample (66.7%) where had nursing institute, the distribution of nurses in hospitals and PHCCs is depending on the allocation and the shortage of MoH which permit only the nurses who have diploma degree in nursing to work in such institutions. This result supported by (Abd Al-Wahid & Nagi, 2015) who found that the highest percentage of the study sample was technician institute graduate and represented (58.6%) of the study sample (Table 1)

The mean age (mean  $\pm$  SD) group of the study sample was (33.5  $\pm$  8.1) and the control group (32.8  $\pm$  8.8), The IMNCI units are vital units which need to be operated by young nurses, this period of age is considered the period of giving because the person is active and energetic, as well as, earned enough experience that helps him to accomplish his tasks in a better way. To ensure the sample homogeneity investigator tried to select a similar sample characteristic as well as these results agreed with (Al-Samarrai & Jadoo, 2018) results who indicated that the mean age of the participants was (mean + SD) 33.18 + 5.82. (Figure 1)

Concerning years of experience, most of the IMNCI nurses 19 (63.3%) have 7 years, the years of experience are very important in the employee's practical life, as he acquires experience from the field of work and from his colleagues who have experience, as well as training courses during the service which increases the level of knowledge and practices, this results confirmed by a study conducted by (Muhaisen et al., 2021) that found that most of the study sample (71.5%) have experience more than 8 years in employment as showed in (Table 2).

Regarding number of participation and duration of IMNCI courses of the studied groups, results revealed that more than half of the participants (56.7%), did not participate previously in IMNCI courses. The IMNCI program has recently started to be applied comprehensively, in addition to the fact that the nursing staff is not fixed in the units in which they work and the nursing specialty system is not activated, so there is a continuous shifting from other units which they are not trained, and since we have witnessed the spread of Covid 19 disease, this has reduced the establishment of training courses for the nurses and medical staff, this result supported by (Muhaisen et al., 2021) study who found that the majority of participants (58.5%) did not participate in IMNCI courses, while (Hussein & Farhood, 2019) mentioned that the majority of participants (76.2%) were participated in IMNCI courses. (Table 2)

Regarding training of health workers according to Kiplagat (2014) who studied the factors influencing the implementation of IMCI in Mwanza in Tanzania, he urged that the trained healthcare workers of (50%) on IMNCI approach is still below the WHO recommendation that at least 60% of health care

workers seeing sick children in the health facilities are trained in IMNCI.

Study finding in relation to practices scores of study group regarding the practices about history taking revealed observed improvement and a highly significant differences in means score at post-test (1) and post-test (2), at ( $P < 0.001$ ). The overall mean score increased from (2.28) before implementation of reinforcement of education program to (2.84) at post-test (1) and almost maintained to (2.83) at post-test (2), with a mean difference of (0.55) and a percentage change of (24.3%), the change was highly significant, ( $P < 0.001$ ). The participants need more emphasize and motivation for practicing some items of history taking domain such as (check out for general danger signs, look for edema of both feet, asking questions about the mother's health which is reinforce the child health). This result agrees with (Sallam *et al.*, 2016) who found that nurses working according IMNCI approach assessed, classified and early diagnosed children, much better and less daily cost than nurses using traditional approach (Table 3). Practices of classification of cases scored the lowest mean score between the four domains of the study before the implementation of the reinforcement educational program which was (pretest 2.00). According to the WHO, at least two out of every five health workers must follow the IMNCI guideline for efficient childhood management, with poor IMNCI guideline implementation, the potential impact of the IMNCI approach on under-five morbidity and mortality is lost. Another supporting evidence of present study findings comes from previous study conducted by (Tawfiq, 2009) who indicated that there was high agreement in classification of IMCI trained health care providers in conditions requiring urgent referral, treatment, or specific nutrition advices. Large proportions of cases incorrectly classified by the health care providers were under-classified as milder cases in non IMCI centers, the reasons included are inaccurate history taking, incomplete or incorrect assessment, not taking assessment findings into account, or giving no classification at all, these results illustrated in Table 4).

Results regarding practices about nutrition and feeding scores revealed that there is significant improvement highly significant differences in mean scores at post-test (1) and post-test (2), at ( $P < 0.001$ ). The change in practice scores regarding nutrition and feeding increased significantly in the study group from (2.16) before implementation of education program to (2.69) at post-test (1) and maintained at (2.69) at post-test (2), with a mean difference of (0.53) and a percentage change of (24.5%), the change was highly significant, ( $P < 0.001$ ). As shown in (Table 5). This result goes along with (Horwood *et al.*, 2009) who found that health workers are implementing IMCI, but assessments were frequently incomplete and 9(12%) health workers checked general danger signs in every child, and 14(18%) assessed all the main symptoms in every

child. Nutritional status was not classified in 567/1357(47.5%) children and only 51/109(46.8%) of children with severe classifications were correctly identified.

A significant problem was the transfer of trained personnel, especially since not all personnel were sent for IMCI training. Concerns have been raised about the transparency of who is sent to training, which can exacerbate the problem.

Practices scores of study group regarding counseling and advice revealed a highly significant differences in means score at posttest (1) and posttest (2), at ( $P < 0.001$ ). The mean practices scores regarding counseling increased significantly in the study group from (2.42) before education program to (2.86) at post-test (1) and maintained at (2.83) at post-test (2), with a mean difference of 0.41 and a percentage change of 17.1%, the change was highly significant, ( $P < 0.001$ ). As shown in (Table 6). These results disagree with (Ali, 2015) results who found that (50%) of the caregiver were not receive counseling on feeding including breastfeeding, (58%) were not seek counseled when to come back immediately, and also 83% were not counseled her own health.

The overall evaluation of the level of practice of participants in the study group was fair in majority of participant (63.3 before implementation the reinforcement education program, while after implementation education program at post-test (1), all participants in this group became of good practice level. The differences between both (study and control) groups was statistically insignificant before implementation education program and it was significant at post-test (1) and at post-test (2), regarding the frequency of good practice, ( $P < 0.001$ ), this results comes along with (Al-Samarrai & Jadoo 2018) and other studies further concur with our findings regarding level of practices they concluded that trained caregivers had statistically significant better practice ( $73.48 \pm 13.46$ ) compared to non-trained caregivers ( $63.95 \pm 17.44$ ), the results of this study demonstrated in (Table 7 & Figure 2).

Regarding association with change in practice scores after education program, age, gender and years of employment showed significant effect on the change in practice scores after education program in the study group,  $r$  value was -0.781, 0.488 and 0.570, respectively,  $P$  value  $< 0.05$ . This results came with line with the second part of studies implemented for evaluating the performance, These studies provided evidence of adequate performance levels among healthcare professionals trained in IMNCI demonstrated that feedback from other trained staff improved performance even further, and demonstrated the importance of IMCI for careers in counseling. The uncontrolled studies assessed the adequacy of the performance, that is, whether IMNCI-trained healthcare workers had high levels of performance for the evaluation, classification, and counseling of children and their careers. The finding of present study showed in (Table 8).

## 7. Conclusion

1. The present reinforcement education program implemented was effective in increasing the nurse's level of practices regarding IMNCI
2. Association between nurses' practices with the age and educational achievement, are significantly and inversely correlated, while years of employment and males' gender was significantly associated with change in the knowledge and practices levels of participants.

## 8. Recommendations

1. Involve all members of the integrated management of neonatal and childhood illness units, nurses in training courses.
2. Follow-up visits to the workplaces of health professionals to examine skill practices and reinforce competence earned during training.
3. Conducting further studies including evaluation of integrated management of child illness services in the country.

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