

Assessment of Knowledge and Practical Skills among Integrated Management of Neonatal and Childhood Illness Program Healthcare Personnel in Primary Healthcare Centers

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Abstract

Background: Integrated management of neonate and childhood illness (IMNCI) guidelines are a simplified system of diagnosis and treatment design for the use by the health workers with limited training. The IMNCI aims to reduce death and illness and to promote growth and development among children under 5 years of age and target acute causes of childhood death. **Objectives:** To study the knowledge and performance of doctors and healthcare workers about IMNCI program and assess the adherence of doctors and healthcare workers to IMNCI guidelines for managing childhood disease. **Materials and Methods:** The study is a cross-sectional study conducted in primary healthcare centers in Babylon Governorate from February to May 2019 on 130 healthcare personnel using a predesignated semi-structured questionnaire including sociodemographic characteristics and knowledge and practice domains about IMNCI. **Results:** The mean age of participants was 37.8 ± 10 years and the age category of ≥ 40 years was the most prevalent (40.8%). While 31.5% aged 20–29 years of age, 27.7% aged 30–39 years of age. The female gender was more dominant among the study sample as 112 (90.8%) of them were females compared to 18 (9.2%) males. Regarding occupation of the study sample, 28.5% of them were family medicine specialists, 27.7% paramedical staff, 23.8% graduate doctors, and 20% were general practitioners. 62% had serving more than 1–10 years while <7.7% had serving <1 year. 76.2% had training in IMNCI while 23.8% without IMNCI training. 56% of total study sample had fair knowledge level, 37% had poor knowledge level, while 7% only had good knowledge. More than 28% had fair practice while 72% had poor practice. **Conclusion:** This study showed that the majority of healthcare personnel had fair knowledge about IMNCI while practical skills were poor.

Keywords: Disease, health, integrated management of neonate and childhood illness, knowledge, practice

INTRODUCTION

More than 7.5 million children globally die each year before reaching the age of 5. Most of these deaths occur in low- and middle-income countries,^[1] where the interaction of common infections (including neonatal sepsis, measles, diarrhea, malaria, and pneumonia) with poor nutritional status, combined with inadequate health infrastructure and poverty, results in poor health outcomes.^[2]

This has resulted in a policy push toward a multipronged strategy aimed at integrating improved healthcare services with better case management skills and healthier community practices to reduce child mortality and morbidity.^[3]

In the mid-1990s, the World Health Organization (WHO), in collaboration with the United Nations Children's Emergency

Fund and other agencies, developed a strategy known as integrated management of childhood illness (IMCI) in response to these challenges.^[3]

Since the 1970s, the estimated annual number of deaths among children <5 years has decreased by almost a third. This reduction,

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however, has been very uneven. Moreover, in some countries, the rates of childhood mortality are increasing. In 1998, more than 50 countries still had childhood mortality rates of over 100/1000 live births.^[4]

Since 1998, integrated management of neonate and childhood illness (IMNCI) strategy was introduced to Iraq. However, the progress of this strategy received no more attention whether from the local or international researcher. The preparation period (1998–2004) for IMNCI implementation was poor and fluctuated up to the second half of 2004.^[5]

The beginning of the year 2005 considered the real time signing the launch of the program, where the MOH together with the WHO reactivated the process with USAID project to scale up IMNCI training as part of the work to support the newly constructed primary healthcare centers (PHCCs) with health professionals.^[5,6]

The expansion phase between 2006 and 2012 indicated the progress of IMNCI implementation in Iraq. Several of Iraqi doctors were engaged in an 11-day training program.^[5]

The number of provinces implemented the program has been doubled by three times from 2006 to 2012 and the number of districts has increased from just 4 to 90 districts. However, the percentage of health facilities implemented the IMNCI program grew from 0.9% to 77.3%, and the number of IMNCI-trained caregivers increased from 189 in 2006 to 5268 in 2012. The number of new IMNCI training courses has increased from 5 in 2006 to 90 in 2012.^[7]

The aim of this study was to investigate the knowledge and performance of doctors and healthcare workers about IMNCI program and assess the adherence of doctors and healthcare workers to IMNCI guidelines for managing childhood disease.

MATERIALS AND METHODS

Study design and sociodemographic data

A cross-sectional study conducted in 24 PHCCs in Babylon Province from February to May 2019. Of 145 PHC providers (PHCPs) who were invited for the interview, a total of 130 PHC workers (PHCWs) from the all PHCCs had been participating in the study. Data were collected using a questionnaire form designed by the researcher and the academic supervisor after reviewing the Iraqi antenatal and postnatal care guideline and related published studies dealing with the same topic; it consisted of three sections (sociodemographic data, knowledge domain [15 questions], and practice domain [25 questions]).

The knowledge domain consists of 15 questions. The knowledge score was applied as correct answer = 2 points, half correct = 1 point (participant not answer all points related to question), and incorrect answer = 0. Hence, the score assessment for knowledge of healthcare personnel was determined according to the quartile status where those below the second quartile (<median, i.e., <15 scores) considered as poor while those on the third quartile (15–22) considered as

fair and those about third quartile (>22–30) considered as good (8) with simple modification. The practical skill domain consists of 25 questions. The practical skill score was applied as yes = 1 point and no = 0. Hence, the score assessment of the practical skill of healthcare personnel was determined according to the quartile status where those below the second quartile (<median, i.e., <13 scores) considered as poor, those on the third quartile (13–19) considered as fair, and those about third quartile (>19–25) considered as good.^[8]

Statistical analysis

Data were analyzed using Statistical analysis was carried out using SPSS version 20 (SPSS, IBM Company, Chicago, USA). The data presented as frequency and percentage tables and pie chart. $P \leq 0.05\%$ was considered statistically significant.

Ethical considerations

Study protocol was reviewed and granted permission by the Ethical Committee of Babylon University, College of Medicine. Verbal consent was obtained from all participants after explaining for them the objective of study. Names of participant were replaced identification codes to keep data confidential.

RESULTS

Figure 1 shows that the mean age of the study group was 37 ± 10 years, and ≥ 40 years of age category was the most prevalent (40.8%), while 31.5% was 20–29 years of age category, and 27.7% was 30–39 years of age category.

Table 1 shows that 27.7% of the study sample was paramedic staff and 72.3% was doctors. The most prevalence were family medicine specialists as 28.5% and 20% were GP doctors. The years of service was 35.4% for those with more than 15 years and 33.1% from 6 to 15 years. Regarding serving in PHCC, the results showed that 62% had serving for more than 1–10 years and <7.7% had serving for <1 year. Regarding training on IMNCI, the results showed that 76.2% had training and 23.8% without training and also the results showed that the most prevalence of the study sample was married (82%).

Results of the present study found that 56% of the total study sample had fair knowledge level, 37% had poor knowledge level, while 7% only had good knowledge [Figure 2].

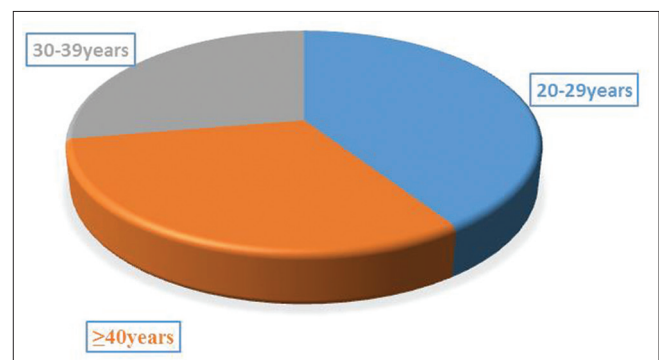
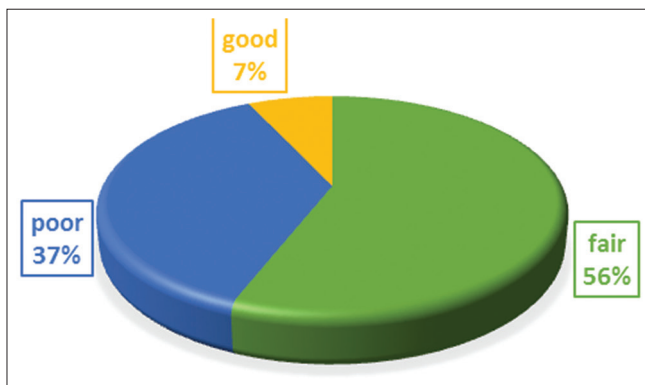


Figure 1: Distribution of study sample according to age category

Table 1: Distribution of study sample according to sociodemographic data

Sociodemographic variable	Frequency (%)
Gender	
Male	12 (9)
Female	118 (91)
Total	130 (100)
Marital status	
Single	20 (15.4)
Married	107 (82.3)
Divorced	1 (0.8)
Widow	2 (1.5)
Total	130 (100)
Residence	
Urban	84 (64.6)
Rural	46 (35.4)
Total	130 (100)
Training on IMCI	
No	31 (23.8)
Yes	99 (76.2)
Total	130 (100)
Years of serving in PHC	
<1	10 (7.7)
1-10	81 (62.3)
>10	39 (30)
Total	130 (100)
Total years of service	
1-5	41 (31.5)
5-10	43 (33.1)
>15	46 (35.4)
Total	130 (100)
Occupation	
GP	26 (20)
Family medicine	37 (28.5)
Graduate doctor	31 (23.8)
Paramedical	36 (27.7)
Total	130 (100)

IMCI: Integrated management of childhood illness, PHC: Primary healthcare, GP: General practitioner

**Figure 2:** Distribution of study sample according to knowledge level

Results of the present study found that 72% of the total study sample had poor practice level, while only 28% had fair

practice level [Figure 3]. Table 2 illustrates the knowledge of the participated PHCWs about the knowledge of IMCI. The results showed that there is a significant association between the types of occupation and level of knowledge ($P = 0.0001$) in which more good knowledge was found in family medicine doctors than the others with highest poor knowledge about graduated doctors (17.7%). Regarding years of service, the results revealed that there is a significant difference with level of knowledge ($P = 0.0001$), with positive as increase the level of knowledge with increase the time of service. The duration of serving in PHC was highest good knowledge in persons with more duration of serving than 10 years (with significant association, $P = 0.005$). Regarding training on IMNCI program, the study showed that 76.2% had training, 6.2% of them had good knowledge, and 50% had fair knowledge with strong significant association, $P = 0.0001$. The results of the present study revealed that the highest present of good knowledge was in persons who had age more than 40 years (significant association; $P = 0.0001$).

Table 3 illustrates the practice of the participated PHCWS about the training of IMCI. The results showed that there is a significant association between the types of occupation and level of practice ($P = 0.0001$) in which more fair practice was found in paramedic staff (25%) than the others with highest poor practice about family medicine doctors (25.4%). Regarding years of service, the results revealed that there is a significant difference with level of practice ($P = 0.006$), with positive relationship as increase the level of practice with increase the time of service. However, the duration of serving in PHC was highest fair practice with duration of serving from 1 to 10 years with significant association, $P = 0.005$.

Regarding training on IMNCI program, the study showed that 76.2% had training, 28.5% of them had fair practice, and 47% had poor practice with strong significant association ($P = 0.0001$). The results also revealed that the highest percentage of fair practice in person who had age more than 40 years 16.9% with a significant association ($P = 0.0001$).

DISCUSSION

The present study showed that knowledge level showed 56% fair, 37% poor, and 7% good knowledge.

The majority of the participated PHCPs (27) had a poor knowledge level and 40% of them had fair knowledge level while 5.4% had good knowledge level. On the other hand, the paramedical knowledge was as follows: 10% had a poor knowledge level, 16% had fair knowledge level, and 1.5% that had good knowledge level. Result also showed that the knowledge level and awareness about IMNCI program were more in workers who have more education level (with significant association, $P = 0.0001$).

This result was similar to the study conducted in South Sudan^[9] which found that diploma and degree compared to certificate holders were more adherent to the IMCI guideline. Our result agreed with several studies conducted in Sudan^[9] and Kenya^[10]

Table 2: Association between knowledge score and sociodemographic characteristics among healthcare personnel

Study variables	Knowledge score				χ^2	P
	Poor	Fair	Good	Total		
Gender						
Male	3 (2.3)	8 (6.2)	1 (0.8)	12 (9.2)	0.80	0.67
Female	45 (34.6)	65 (50.0)	8 (6.2)	118 (90.8)		
Marital status						
Single	13 (10.0)	6 (4.6)	1 (0.8)	20 (15.4)	14.64	0.23
Married	35 (26.9)	65 (50.0)	7 (5.4)	107 (82.3)		
Divorced	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.8)		
Widow	0 (0.0)	1 (0.8)	1 (0.8)	2 (1.5)		
Residence						
Urban	30 (23.1)	45 (34.6)	9 (6.9)	84 (64.6)	5.30	0.07
Rural	18 (13.8)	28 (21.5)	0 (0.0)	46 (35.4)		
Occupation						
General practitioner	5 (3.8)	18 (13.8)	3 (2.3)	26 (20.0)	28.2	0.0001*
Family medicine	7 (5.4)	26 (20.0)	4 (3.1)	37 (28.5)		
Graduate doctor	23 (17.7)	8 (6.2)	0 (0.0)	31 (23.8)		
Paramedical	13 (10.0)	21 (16.2)	2 (1.5)	36 (27.7)		
Years of service						
1-5	30 (23.1)	11 (8.5)	0 (0.0)	41 (31.5)	35.42	0.0001*
6-15	10 (7.7)	28 (21.5)	5 (3.8)	43 (33.1)		
>15	8 (6.2)	34 (26.2)	4 (3.1)	46 (35.4)		
Years of serving in PHC						
<1	7 (5.4)	3 (2.3)	0 (0.0)	10 (7.7)	15.03	0.005*
1-10	35 (26.9)	42 (32.3)	4 (3.1)	81 (62.3)		
>10	6 (4.6)	28 (21.5)	5 (3.8)	39 (30.0)		
Training in IMCI should be yes then no						
Yes	26 (20.0)	65 (50.0)	8 (6.2)	99 (76.2)	20.26	0.0001*
No	22 (16.9)	8 (6.2)	1 (0.8)	31 (23.8)		
Age groups (years)						
20-29	30 (23.1)	11 (8.5)	0 (0.0)	41 (31.5)	35.37	0.0001*
30-39	9 (6.9)	24 (18.5)	3 (2.3)	36 (27.7)		
≥40	9 (6.9)	38 (29.2)	6 (4.6)	53 (40.8)		

* $P \leq 0.05$ was statistically significant. IMCI: Integrated management of childhood illness, PHC: Primary healthcare

that found high knowledge to the IMCI guideline at health facilities level. Our results contradict with previous study in Tanzania that found low adherence to the IMCI guidelines among clinicians with better knowledge of IMCI.^[11] In addition, another study in Uganda controverts earlier evidence that well-trained health workers in rural and hard to reach areas hardly stick to guidelines set for treating pneumonia.^[12]

The current study showed that the knowledge level increases with age. Also, most of good respondents were aged more than 40 years (40.8%) and only 31% of them aged 20–29 years. This result is similar to the study conducted in Ghana.^[12] Some of the findings of the current study are comparable to those of a disagree to study conducted in India, where respondents aged 18–30 years were 39.2%,^[13] compared to the current study, where respondents in that age category are 27%.

However, the working experience of respondents in this study is quite dissimilar to the Indian study. The proportion of professionals who had been working at their current facility for 1–3 years and 4–5 years in the Indian study was 1.5% and

19.6%,^[14] whereas the proportions in the current study are 7.% and 62.%, respectively.

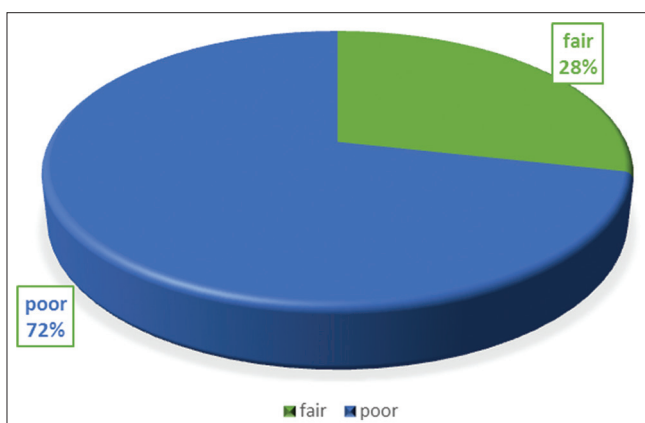
The current study showed a significant association between the types of occupation and level of practice ($P = 0.0001$) in which more fair practice was found in paramedical staff 25% than the others with highest poor practice about family medicine doctors 25.4%. Regarding training on IMNCI program, the study showed that 76.2% have training, 28.5% of them had fair practice, and 47% had poor practice with strong significant association ($P = 0.0001$).

This result disagrees with a cross-sectional comparative study conducted in Iraq,^[15] an equal sample of 42 trained and 42 nontrained caregivers who are working in 20 PHCCs in Tikrit city and other districts of Salah Al-Din Governorate of Iraq were included in the study found that IMNCI-trained medical staff (doctors) had statistically significantly better practice (88.15 ± 2.70) compared to IMNCI-trained nurses or paramedical staff (66.90 ± 10.84) ($P = 0.000$) and also these nurses found a difficulty in implementing the IMNCI guidelines

Table 3: Association between practical skills score and sociodemographic characteristics among healthcare personnel

Study variables	Practical skills score			χ^2	P
	Poor	Fair	Total		
Gender					
Male	8 (6.2)	4 (3.1)	12 (9.2)	0.15	0.74
Female	85 (65.4)	33 (25.4)	118 (90.8)		
Marital status					
Single	18 (13.8)	2 (1.5)	20 (15.4)	4.78	0.19
Married	73 (56.2)	34 (26.2)	107 (82.3)		
Divorced	1 (0.8)	0 (0.0)	1 (0.8)		
Widow	1 (0.8)	1 (0.8)	2 (1.5)		
Residence					
Urban	60 (46.2)	24 (18.5)	84 (64.6)	0.001	0.57
Rural	33 (25.4)	13 (10.0)	46 (35.4)		
Occupation					
General practitioner	26 (20.0)	0 (0.0)	26 (20.0)	98.97	0.0001*
Family medicine	33 (25.4)	4 (3.1)	37 (28.5)		
Graduate doctor	31 (23.8)	0 (0.0)	31 (23.8)		
Paramedical	3 (2.3)	33 (25.4)	36 (27.7)		
Years of service					
1-5	37 (28.5)	4 (3.1)	41 (31.5)	10.3	0.006*
6-15	27 (20.8)	16 (12.3)	43 (33.1)		
>15	29 (22.3)	17 (13.1)	46 (35.4)		
Years of serving in PHC					
<1	10 (7.7)	0 (0.0)	10 (7.7)	4.49	0.11
1-10	57 (43.8)	24 (18.5)	81 (62.3)		
>10	26 (20.0)	13 (10.0)	39 (30.0)		
Training in IMCI					
No	31 (23.8)	0 (0.0)	31 (23.8)	16.195	0.0001*
Yes	62 (47.7)	37 (28.5)	99 (76.2)		
Age groups (years)					
20-29	36 (27.7)	5 (3.8)	41 (31.5)	9.77	0.008*
30-39	26 (20.0)	10 (7.7)	36 (27.7)		
≥40	31 (23.8)	22 (16.9)	53 (40.8)		

* $P \leq 0.05$ was statistically significant. IMCI: Integrated management of childhood illness, PHC: Primary healthcare

**Figure 3:** Distribution of study sample according to practice level

because they need longer time and as such would increase the average time for assessing and managing children.^[15] However, Tanzanian study done in 2004 reported that IMNCI-trained nurses had better performance than IMNCI-trained medical officers.^[16]

These variations might attributed to the difference in settings of these studies, training courses, and constitution of the study groups, as the current study respondents were PHCWs who provide health care at PHCCs with limited resources.

CONCLUSION

This study has revealed that both knowledge on, and adherence to, the protocol IMNCI among healthcare workers caring for children under-five in the study area are low. If quality healthcare delivery to children under 5 years in the health facilities studied is to be ensured, it is important that healthcare providers not only become aware and knowledgeable about the IMNCI protocol but also adhere to the protocol in the delivery of healthcare to children. Routine in-service training of healthcare providers on the IMNCI protocol could improve both knowledge on and adherence to the protocol IMNCI.

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Conflicts of interest

There are no conflicts of interest.

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