

# A survey on Integrated Management of Neonatal and Childhood Illness implementation by nurses in four districts of West Arsi zone of Ethiopia

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**Background:** In Ethiopia, one in 17 children dies before 1 year of age and one in 11 children dies before 5 years. Research that examines the factors influencing the implementation of the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) strategy in Ethiopia is limited. This study aimed to identify the factors compelling the execution of IMNCI by nurses in four districts of West Arsi zone of Ethiopia.

**Methods:** A mixed-method cross-sectional study was conducted from February to March 2016 in West Arsi zone of Oromia regional state, Ethiopia. A total of 185 Integrated Management of Childhood Illness (IMCI)-trained registered nurses working at Under-Five Clinic were purposively chosen for the study among 291 registered nurses based at health centers and hospitals in the Arsi zone. The study was complemented by a qualitative method.

**Results:** More than half (57.8%) of the nurses interviewed had been trained (51.35% of them attended in-service training). The most common issues encountered in the implementation of IMCI were: lack of trained staff (56.2%), lack of essential drugs and supplies (37.3%), and irregular supportive supervision (89.2%). The qualitative data supplemented the factors that influence IMNCI implementation, including drug unavailability, lack of human resources, and lack of effective supportive supervision and follow-up visits. Therefore, interventions aiming at training nurses, with emphasis on performing supportive consistent supervision and supporting the system of health care by enhancing admittance to indispensable drugs and supplies, are recommended to help IMCI implementation.

**Keywords:** IMNCI-trained nurses, implementation, West Arsi Zone, Ethiopia

## Background

The World Health Organization (WHO) and the United Nations International Children's Fund (UNICEF) implemented Integrated Management of Childhood Illness (IMCI) in 1996.<sup>1</sup> The aim of Integrated Management of Neonatal and Childhood Illnesses (IMNCI) was to reduce childhood morbidity and mortality in developing countries as well as Ethiopia. IMNCI is a strategy that integrates all available measures for health promotion, prevention, and integrated management of childhood diseases through their early detection and effective treatment, and promotion of healthy habits within the family and community.<sup>1,2</sup> IMNCI aims at reducing death, illness, and disability, and promoting improved growth and development among children under five years of age.

Implementing the IMNCI strategy is important as it is a consistent and standardized approach that addresses the major causes of under-five morbidity and mortality which are responsible for more than 90% of deaths in this age group in Ethiopia. The major causes of under-five mortality in Ethiopia have been identified as follows: pneumonia

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(28%), neonatal problems (25%), malaria (20%), diarrhea (20%), measles (4%), AIDS (1%), and others (2%).<sup>3</sup>

According to the UNICEF's report, in the year 2010 around 7.6 million children died before five years of age. One in every 17 Ethiopian children dies before one year of age, and one in every 11 children dies before five years. Childhood mortality is higher in rural areas than in urban areas. These mortality rates are highest in Benishangul-Gumuz and lowest in Addis Ababa.<sup>4</sup>

One of the targets of the Millennium Development Goals (MDGs) is to reduce the under-five mortality rate by two-thirds between 1990 and 2015. Programs to increase the proportion of births attended by skilled health personnel, to increase immunizations against the vaccine-preventable diseases, to provide early care and treatment to sick children, and to upgrade the status of women through education and enhanced participation in the labor force, can all help to improve the probability of survival of young children.<sup>5</sup>

Ethiopia is one of the seven high-mortality countries, together with Bangladesh, Malawi, Nepal, Liberia, Tanzania, and Timor, with the utmost drops in child mortality (by two-thirds or more) between 1990 and 2012, consequently realizing MDG4 in advance before the 2015 deadline.

Under-five mortality rate has been reduced to 101/1000 in 2010, and more than 90% of child deaths were owing to pneumonia, diarrhea, malaria, neonatal problems, malnutrition, and HIV/AIDS, and frequently a blend of these conditions. This rate is very high; nonetheless, there has been a steady drop in under-five mortality rate in the past 15 years.<sup>6</sup>

Despite the fact that under-five mortality rates in Ethiopia are gradually decreasing, most of the child deaths in Ethiopia are owing to preventable diseases that can be addressed by the procedures and guidelines stipulated in the IMNCI protocol.

A multi-country evaluation conducted in 2002 and various countries' experiences with IMCI implementation have revealed that many countries lack adequate health system support for IMCI implementation including poor adherence to IMNCI guidelines, high turnover among trained staff, inadequate supervision, and insufficient availability of drugs, equipment, and referral facilities.<sup>7,8</sup>

The IMNCI has been implemented in Ethiopia for years. Nevertheless, there is limited information and evidence on the quality of its implementation and operational constraints. The investigators have found no recorded study results in Ethiopia, identifying possible encounters in the implementation of the IMCI strategy by the IMNCI-registered nurses. Such information is critical to guide further implementation of the program and to improve IMNCI services. This information will also be useful to other researchers to conduct

large-scale community-based studies on newborn and child health interventions. The study aimed at identifying factors compelling the execution of IMNCI by nurses in four districts of West Arsi zone of Ethiopia.

## Methods

### Quantitative data

#### Study design and setting

We conducted a mixed-method facility-based cross-sectional study from February to March 2016 in West Arsi zone of Oromia regional state. West Arsi is located in southeast Ethiopia (251 km far from the capital Addis Ababa). It is one among the districts of Oromia regional state having pronounced under-five mortality rates, and above 85% of the under-five population are presented at the government health institutions. It is due to this reason that we were interested in the government-owned facilities for the present study. As per West Arsi zone health bureau statistics, there are 84 operating government-owned health facilities (three hospitals and 81 health centers) offering preventive and curative services to children among other services. All the three hospitals and 24 of the health centers (30%) were selected by a simple random sampling method for the study. The selected health facilities had 291 registered nurses, of which 185 IMCI-trained registered nurses were selected for the study. The sample size (185) was then proportionately distributed according to the population of nurses in the selected health facilities.

Health centers are mainly staffed by registered nurses, midwives, and public health officers. Medical doctors are rarely hired in health centers since they are frequently hired at district hospitals or beyond. In the present study, "IMNCI-trained registered nurses" denote nurses graduated with nursing (diploma and degree) who are registered and have magnificently accomplished the IMNCI training.

#### Sample size and sampling technique

We calculated the sample size based on the Slovin's formula, which is used when the prevalence is not required or unknown:<sup>2</sup>

$$n = \frac{N}{1 + N(e)^2}$$

where n=sample size, N=population size, and e=sampling error (assumed to be 5%, that is, 95% CI=  $\frac{291}{1 + 291(0.05)^2}$  =168). Bearing in mind the 10% nonrespondent rate, the final sample composed of 185 nurses.

The target population comprised 291 registered nurses based at health centers and three hospitals in the Arsi zone (i.e. Shashemane, Arsi Negele, Shala, and Dodola). A total of 185 IMCI-trained registered nurses working at under-five clinic were purposively chosen among these 291 registered nurses. We recruited the study participants based on the following inclusion criteria: graduated in nursing (a degree or a diploma) and trained in IMNCI; working at under-five clinic in selected district; accessible at work place; and willing to participate in the study.

### Instrument

We collected the data by a structured face-to face interview guide. We adapted the questionnaire from preceding allied studies.<sup>2,9</sup> Primarily, the researchers developed it in English, and later the language expert translated it into Amharic (local language) and back to English to guarantee its accurateness. The questionnaire comprised two parts which included questions on sociodemographic characteristics (age, religion, sex, ethnicity, educational status, and marital status) and factors affecting IMNCI implementation (including year of service, IMNCI training, and supportive supervision, shortage of staff, and essential drugs and supplies).

The quality of the collected data was guaranteed by the following procedures. The researchers pretested the questionnaire among 5% of the sample in a comparable set-up (Kofele district health center), and essential modifications were then made. The researchers trained the data collectors on interview to augment data accuracy and validity. There was close supervision of the data collectors by the investigators. The participants were explained about the aim of collecting data and the importance of the study to generate reliable data.

### Qualitative data

The study was complemented by a qualitative method. The data were collected by a semi-structured interview guide. The semi-structured guide was developed for interviews with nurses, primarily concerned with their knowledge about the IMNCI approach, factors compelling their practice of the approach, and their awareness of monitoring and supervision of trained nurses (including IMNCI training, shortage of staff, and essential drugs and supplies).

Seven in-depth interviews (IDIs) were conducted with IMNCI-trained nurses including four nurses with diploma and three registered nurses with BSc qualification. Out of seven IDIs, three were conducted at primary health care (PHC) facilities of urban district, while the remaining four IDIs were conducted at PHC facilities of rural districts.

Participants involved were two female and five male who were within the age range of 25–45 years.

We selected the nurses purposively and followed them to their locality where the health facilities are located, and the IDIs were conducted. Consent to take part in interview was sought prior to the meeting, and interviews were conducted only after written consent was obtained. The data collection team comprised the researchers and a research assistant. The discussions were audio-taped with participant's consent, and the researcher took written notes. Each session lasted for 45–60 minutes.

### Ethical consideration

We obtained ethical clearance from the Institutional Review Board of the Department of Nursing and Midwifery, Addis Ababa University. Authorized letter was obtained from West Arsi zone health district. We informed the study participants about the aim of the study, and their right to refuse to participate or withdraw from the study. We guaranteed confidentiality by excluding their names or addresses in the questionnaire and final report.

### Data analysis

#### Quantitative data

Data were entered into Epi Info version EpiData 3.1 and were cleaned and exported to SPSS version 22.0 for data analysis. Categorical variables were presented as frequencies and percentages.

#### Qualitative data

We analyzed the qualitative data concurrently with data collection. We used thematic analysis and transcribed all data verbatim. The researchers (fluent in Amharic) transcribed and translated all IDIs into English. When there was difference, the researchers revised the transcriptions and original recordings till consensus was reached. The transcripts were then categorized into themes and analyzed manually. All data were kept in a lockable cupboard and were only accessible to the researchers. Finally, factors compelling IMNCI implementation were documented.

## Results

### Sociodemographic characteristics

A total of 185 nurses took part in the study. More than half (55.7%) of the study participants were in the age range of 25–29 years with a mean ( $\pm$ SD) age of 26.65 ( $\pm$ 1.7) years. As regard their marital status, about 55.7% ( $n=103$ ) of them were married. Among the total study participants, more than

half (57.3%, n=106) were Muslims, and 88.1% (n=163) were Oromo by ethnicity. Of the 185 registered nurses who were trained in IMCI, more than half (57.8%, n=107) had completed diploma while 40.0% (n=74) had bachelor degree. All the 185 IMCI-trained registered nurses who took part in this study were general nurses, and 70.8% (n=131) were male (Table 1).

## Challenges reported by nurses in executing the IMNCI

### Training and supervisory mechanism

Fifty-eight percent (n=107) of nurses interviewed had been trained (51.35% of them attended in-service training). Most of the nurses had attended training in IMNCI between 2005 and 2009. In our study, most (89%, n=165) of the respondents stated they were not getting any supervision from the time they had training. Eighty-nine percent of these nurses who had been trained in IMNCI reported that the training was inadequate and hence proposed that follow-up supervision in their workplaces ought to be enforced to supplement the training received. The rest (11%, n=20) of the trained nurses reported that the training was sufficient to effect IMNCI

**Table 1** Sociodemographic characteristics of respondents among nurses in public health institutions of four districts in West Arsi zone, April 2016 (n=185)

Variables	Frequency	Percent
Age		
20–24	56	30.3
25–29	103	55.7
30–34	9	4.86
35–39	9	4.86
40–44	8	4.3
Sex		
Male	131	70.8
Female	54	29.2
Level of qualification		
MSc	4	2.2
BSc	74	40.0
Diploma	107	57.8
Marital status		
Married	103	55.7
Single	79	42.7
Divorced	3	1.6
Religion		
Orthodox	44	23.8
Muslim	106	57.3
Protestant	34	18.4
Other	1	0.5
Ethnicity		
Oromo	163	88.1
Amhara	16	8.6
Others	6	3.2

approach successfully. All of the trained nurses specified that they had not been given IMNCI update courses or supportive supervision from the time they had their initial training in IMNCI. Fifty percent of the nurses who had been trained in IMNCI revealed their concern for update courses.

Only a few trained nurses (9.2%, n=17) at PHC facility acknowledged that they were visited by a focal person at their health facility once since they had been trained in IMNCI between 2005 and 2009.

The qualitative evidence augmented the quantitative findings. One of the participants shared his views as follows:

Periodic supportive supervision is unavoidable, our focal person should be accountable to do the supervision – he/she should check if we are implementing the approach or not.

Another participant quoted his experience regarding the necessity for capacity building for better monitoring of IMNCI implementation approach:

I have certainly not joined IMCI update training ever since I received IMCI training in 2007. It is now 9 years back.

### Knowledge about IMCI strategy

Only about 28% (52/185) of the interviewed nurses were aware of the IMNCI method and the prevailing childhood illness where the IMNCI guidelines need to be tracked. Of these knowledgeable nurses, 86.5% (45/52) were commonly cognizant of IMNCI approach including how to assess and manage at least the five target diseases, which include pneumonia, diarrhea, malnutrition, measles, and malaria.

One participant stated her views as follows:

My knowledge and awareness with reference to the IMNCI practice is little. You know there is no follow up visits or supervision and update courses, either – nothing!

I don't accurately distinguish what I am expected to do, for instance, how to monitor IMNCI implementation strategy. I had not been given any opportunity for update training or any other support with respect to this.

### Challenges related to resources (supplies and human power)

The health care support system factors like accessibility of supplies, a group of trained health workers, and indispensable drugs particularly for the treatment of pneumonia, diarrhea (oral rehydration salts), and malaria are essential in IMNCI implementation. In the present study, when the nurses were asked about supplies and materials, the foremost encounters acknowledged in the implementation of IMNCI

were lack of trained staff (56.2%, 104/185) followed by lack of essential drugs and supplies (44%, 81/185). Scarcity of trained nurses in relation to numerous children in search of treatment was similarly stated as a challenge by 16% (30/185) of respondents. Fifty-seven percent (106/185) of the respondents reported that essential drugs, IMNCI wall charts, and chart booklets are commonly lacking. Time constraint to practice IMNCI was also reported by 33% (61/185) of the respondents.

I have practiced IMNCI since my initial training. Nonetheless, I don't provide enough time to all under five cases owing to increased patient flow at our health facility.

IMNCI is partly being implemented as nurses not trained in IMNCI take over the care of new children coming up to the health institution (when there is no nurses trained in IMNCI).

## Discussion

This study aimed at identifying factors compelling the execution of institution-based IMNCI by nurses in four districts of West Arsi zone of Ethiopia. Implementation of the IMNCI meets a pervasive range of encounters given the feeble health organizations in most low-income countries, including Ethiopia. In our study, 58% (n=107) of the nurses interviewed had been trained in IMNCI (51.35% of them attended in-service training). From 2005 to 2009, the highest number of nurses had received IMNCI training; however, the number of trained nurses (57%) were below the WHO's recommended number, which says at least 60% of health care providers treating ill children in the health institutions should be trained in IMNCI.<sup>2</sup> On the other hand, our finding is greater than that reported by earlier studies from African region. For example, a preceding study conducted by Mullei et al in Kenya in 2007 reported that the magnitude of health care providers trained in IMNCI approach was 18%,<sup>9</sup> whereas the coverage reported from Tanzania was 14%.<sup>10</sup>

Dearth of supervision is an added challenge as documented in the implementation of IMCI.<sup>2,11,12</sup> Furthermore, our study shows that no IMNCI refresher courses or periodic supervision have been given to the nurses trained in IMNCI since their initial IMNCI training as reported by 58% of them.

Our study also revealed that 72% of the interviewed nurses were not aware of the IMNCI approach, which is supported by qualitative findings.

Our findings in the present study are consistent with previous literature. For example, a preceding study from Tanzania reported that no opportunities had been given to nurses for

update courses which might lead to knowledge degeneration of the learnt IMNCI approach.

In the same study from Tanzania, Kiplagat et al reported that 69% of the health providers who had been trained in IMCI stated that the training was not adequate, and they suggested that mentoring and update courses were needed at workplace to complement the training received from a workshop.<sup>2</sup>

This might be a short training related to the topic learned that was not able to be practiced in the workplace. Limited mentoring while at work and updated courses at the workplace, which enrich the health providers' awareness and skills were not in place.

Prosper and Borghi<sup>13</sup> also identified this encounter. They revealed that IMCI supervision is not regular, and not well integrated with scheduled supervision. Moreover, the checklists are often not available during follow-up visit.

In a study from South Africa, Horwood et al<sup>14</sup> also stated about dearth of support from supervisors and coworkers, mainly those health care providers not trained in IMNCI, is a foremost overwhelming issue among IMNCI organizers. They reported that the issue was prominent when supervisors were not trained in IMNCI.

In our study, an added challenge that is diligently associated with lack of supervision is the absence of periodic on-job visits. Periodic on-job supervision for providers following case management training is a serious aspect of IMCI execution. Mullei et al distinguished the benefits of periodic on-job visits after training in IMCI, which included reinforcement of the learnt case management skills and documentation of prospective encounters, which health providers might face when implementing IMNCI and collecting of data on institutional-based support. The noticeable factors reported by nurses included nonexistence of supervision and absence of upgrade courses. Dearth of monitoring and supervisory mechanism for trained staff perhaps designates absence of planning and further stress on teaching instead of strengthening all aspects of health scheme.<sup>11</sup>

IMNCI is basically encompassed in integrated supervision visits. Horwood et al<sup>14</sup> argued that for sustainable progress to materialize in IMNCI execution, training ought to be amalgamated with other approaches, for example, with supervision and follow-up supervision. Horwood et al correspondingly referred to a study that assessed interventions to advance the performance of health workers trained in IMCI, and reported that provision of training and support for supervisors, continuing supervision, additional job aids, and incentives not related to finance improved the enactment of IMNCI.

In our study, scarcity of materials and required drugs was also identified as a foremost encounter in IMCI enactment. Paucity of health care providers as compared to the countless children seeking treatment was distinguished to be a common factor impeding the implementation of IMCI in the health institutions of the study setting.

Our finding is incongruent with a study in Kenya. For instance, Mullei et al reported that health institutions in Kenya often experience a prolonged shortage of IMCI drugs, since drug deliveries are often deferred or do not meet the quantities requested by the facilities.

Scarcity of health care providers has been reported in former studies as the foremost challenge in the enactment of IMNCI in health centers and dispensaries. Sufficient supply of crucial drugs and materials was also reported by health care workers as a key to help them practice IMNCI recurrently.<sup>2,10–13</sup>

Surge of labor force was also acknowledged as one aspect leading to effective execution of IMCI approach, which in turn reduces work pressure. Subsequently, the health provider will get extra time to stick to IMCI plan recurrently in treatment of ill children. A health care provider from South Africa suggested “increasing IMNCI coverage would strengthen implementation”.<sup>13</sup>

Time constraint to practice IMNCI was also reported by 33% of respondents in our study. In 2009, Horwood et al stated on the practices of training and execution of the IMNCI plan in South Africa. One of the encounters they reported was that IMNCI discussions were time-consuming. They maintained that “the counselling messages recommended by IMCI are time-consuming for health providers to deliver, which may perhaps limit counselling messages to those that are utmost vital”.<sup>13,14</sup> Most importantly, staff unavailability at various PHC facilities in South Africa is identified as an encounter to performing IMNCI.

The findings of this study should be interpreted in the light of its limitations. We conducted this study in four districts of West Arsi zone of Oromia regional state in Ethiopia. The target population comprised registered nurses who were trained in IMNCI based at health centers in West Arsi zone of Oromia region, Ethiopia. Similar health institutions in the Oromia regional state may share some of their characteristics but they are by no means homogeneous, and so any generalization of the results of this study must be made with caution. Therefore, the study findings can be generalized only to the study setting.

In conclusion, this study makes an important contribution to evaluation of the implementation of IMCI. It documents the absence of periodic on-job supervision and refresher trainings as challenges to the success of IMCI. The study

suggested the following pertinent recommendations to solve the recognized encounters.

IMNCI enactment might be enhanced by guaranteeing accessibility of materials, medicine, and human resources. In their study in Kenya, Mullei et al stress that understaffing and erratic drug supplies need to be considered. It is emphasized that health providers need extra support to perform IMNCI. The support has to include but not limited to adequate trained nursing staff, supplies of indispensable drugs, and consistent supportive supervision.

The health scheme has to guarantee follow-up training and supervision of IMNCI coach to endorse and upsurge the use of the IMNCI approach. It is eminent that follow-up supervisions are vital, as they do benefit the trained nurses to share their expertise on practice. It is also revealed that this encounter might be ratified by means of increasing the number of health care providers who are trained in the IMCI approach.

Further comprehensive community-based study is compulsory on IMNCI operation to better understand the perspectives of other stakeholders including key authorities involved in design and policy makers, physicians, and public health officers (IMCI-trained) working at PHC facilities in the study setting.

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## Author contributions

SS Seid hypothesized the study, searched literature, and trained the research assistants in data collection. He also wrote the results and discussion sections, and drafted the manuscript. EG Sendo contributed to the design of the study, advised on methods and data interpretation, and analyzed the qualitative data. He also critically revised and edited the manuscript. Both the authors read and approved the final manuscript.

## Disclosure

The authors declare that they have no competing interests in this work.

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