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POSTGRADUATE PROGRAM

IMPLEMENTATION OF INTEGRATED MANAGEMENT OF NEONATAL AND CHILDHOOD ILLNESS AND ITS ASSOCIATED FACTORS IN HEALTH CENTERS OF EAST SHAWA ETHIOPIA, 2023

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STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, analysis, interpretation and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used to prepare this document. Every serious effort has been made to avoid any plagiarism in the preparation of this thesis. This thesis is submitted in partial fulfilment of the requirement for the degree of masters from the School of Graduate Studies at Addis Ababa University. The thesis is deposited in the Library of Addis Ababa University and is made available to the user under the rules of the library. I strongly declare that this thesis has not been submitted to any other institution anywhere for the award of any academic certifications. Brief quotations from this thesis may be used without special permission provided that accurate and complete acknowledgement of the source is made. Requests for permission for extended quotations from, or reproduction of, this thesis in whole or in part may be granted by the Head of the School or Department or the Dean of the School of Graduate Studies when in his or her judgment the proposed use of the material is in the interest of scholarship. In all other instances, however, permission must be obtained from the author of the thesis.

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BIOGRAPHICAL SKETCH

I was born in Nekemt Wellega Oromia, in 1987E.C. I attended primary, secondary and preparatory school in Nekemt catholic kidanemihret school ; Then i joined Adama University, Asssela college of health science and graduated in nursing on 2009. I had a total of 4years experience in Mojo primary hospital and then in Wachamo university Nigist Elleni Mohammed memorial referral I hospital as a staff nurse.

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ACRONYM AND ABBREVIATIONS

AAU	Addis Ababa University
IMNCI	Integrated Management of Neonatal and Childhood Illness
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization
MDG	Mellinnium developmental Goal
SDG	Sustainable developmental Goal
EDHS	Ethiopian demographic health survey

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Abstract

Background: Integrated Management of Neonatal and Childhood Illnesses (IMNCI) is a child health program that provides an integrated approach to the well-being of the whole child. IMNCI is provided by health facilities to aid children under-five years of age from preventable and treatable conditions. IMNCI has been successful in reducing under-five mortality, but there is little research on its implementation process in Ethiopia.

Objectives: To assess the implementation of the IMNCI program and its associated factors in health centres of East Shewa.

Methods: A cross-sectional study was conducted from March to April 2023 at selected health centers in East Shawa. A total of 155 health professionals were selected using simple random sampling. The data was gathered using self-administered structured pretested questionnaires. The data was entered into Epi-info and exported to SPSS version 26 for analysis. Bivariate and multivariate logistic regression analysis was employed. A p-value of less than 0.05 was considered statistically significant.

Result: The study enrolled 155 health professionals. Overall, 69% of health professionals implement IMNCI strategies. In multivariate logistic regression, MSc degree level of qualification (AOR 4.79; 95% CI = 1.147–20.061), BSc degree level of qualification (AOR 3.492; 95% CI = 1.194–10.21), age group of 30-36 (AOR 0.255; 95% CI = 0.070–0.925), not attending IMNCI training (AOR 0.162; 95% CI = 0.061–0.426), and negative attitude toward IMNCI strategies (AOR 0.178; 95% CI = 0.069–0.461) were significantly associated with IMNCI implementation.

Conclusion: The study found that IMNCI implementation is acceptable in the study setting, but there is room for improvement. The findings of the study suggest that increasing the level of qualification of health professionals, providing IMNCI training and promoting a positive attitude toward IMNCI strategies can improve IMNCI implementation.

1 INTRODUCTION

1.1 Background

Integrated management of neonatal and childhood illness(IMNCI) is a thorough approach to child health that focuses on the child's overall wellbeing with the aim of lowering death, disease, and impairment as well as promoting enhanced growth and development in children under the age of five. IMNCI comprises both preventive and curative components that are implemented by families, communities, and health care providers(1).

The World Health Organization (WHO) and UNICEF launched IMNCI in 1992 as an integrated approach to improving children's health around the world. The IMNCI offers unified health care rather than separate management of diseases affecting children under the age of five. Furthermore, this method focuses on lowering morbidity and mortality rates related with the most common childhood diseases(2,3).

Over 100 countries have implemented IMNCI's three components: organizational, clinical, and community. The organizational components strive to improve health systems to deliver quality care, the clinical components aim to improve healthcare personnel' case management abilities, and the community components aim to improve family and community health practices for health, growth, and development(4,5).

In Ethiopia, IMNCI was adopted in 1996 and was initially implemented in four regions before being expanded to all regions. Each sick child is checked at the health center for general danger signals, IMNCI major symptoms (cough, trouble breathing, fever, diarrhoea, ear problem), nutritional state, immunization status, and other complaints. The condition of each children is classified, and treatment is offered based on the classification (using the 'Assess, classify, and treat' strategy).New-born sepsis, hypoxia, pneumonia, diarrhoea, meningitis, malaria, measles, common skin disorders, ear infections, HIV/AIDS, and anemia are among the conditions managed by the IMNCI strategy. By the end of the 2012 Ethiopian fiscal year, 95% of the country's total 3,582 health centers have begun to provide IMNCI(6).

1.2 Statement of the problem

Globally, an estimated 5 million children died before reaching the age of five by 2021. More over half of these deaths, 2.7 million, occurred in children aged 1 to 59 months, with the remaining, 2.3 million, occurring in the first month of life. Children born in low- and middle-income nations were 14 times more likely than children born in developed countries to die before reaching the age of five, with an under-five mortality rate of 67 deaths per 1,000 live births compared to 5 deaths per 1,000 live births in affluent countries(7,8).

Ethiopia has one of the highest under-five mortality rates, with 59 deaths per 1,000 live births according to the Ethiopian miniDHS 2019. Furthermore, one in every 30 Ethiopian children dies during the first month, one in every 21 dies before their first birthday, and one in every 17 dies before their fifth birthday(9)

The vast majority of this tragic loss of life could have been avoided with widespread and effective interventions. Malnutrition, acute respiratory infection, and diarrheal disease are the leading causes of under-five mortality in Ethiopia, and they are all preventable with targeted interventions and the use of internationally and locally determined policies. The persistence of the preventable burden of child mortality raises concerns about the success of such efforts. This also raises doubts about the SDGs' achievement(10,11).

Evidence suggests that Integrated Management of Neonatal and Childhood Illness is the best option for improving child survival. Furthermore, evidence suggests that the IMNCI strategy has contributed to reductions in child mortality during the Millennium Development Goals (MDGs) era, and if optimally implemented, the IMNCI strategy could help most countries achieve Sustainable Development Goal (SDG) number three: good health and well-being, which includes reducing under-five mortality to 25 per 1,000 live births by 2030. A recent Cochrane review indicated that when activities were successfully implemented in health institutions and communities, the strategy was associated with a 15% reduction in child mortality(12,13).

Even with IMNCI's widespread success over the previous 25 years, and the fact that most countries still regard it as an important and effective method for delivering lifesaving interventions, very few countries have achieved complete implementation and coverage. Implementation of IMNCI has been particularly difficult in nations with inadequate health systems, and health care workers frequently struggle to provide IMNCI services due to resource constraints(14).

Furthermore, various studies found that adherence to and implementation of the IMNCI procedure were quite poor. Lack of training, poor supervision, a lack of IMNCI essential drugs and on-the-job aid, health workers' perceptions, a shortage of staff, the nature of the strategy, and a lack of support from the government and stakeholder groups were the most frequently identified bottlenecks for poor implementation(4,15–17).

Despite the success of IMNCI in reducing under-five mortality and the existing implementation obstacles, little research has been conducted to investigate the implementation process in our nation. As a result, the purpose of this study is to evaluate the implementation of Integrated Management of Neonatal and Childhood Illness in Health Centers at East Shewa.

1.3 Significance of the study

The IMNCI program plays an important role in lowering child mortality and morbidity. This is just one studies being undertaken to assess the implementation of Integrated Management of Neonatal and Childhood Illness in Health Centers. As a result, the findings of this study will contribute to the current body of knowledge on IMNCI implementation in Ethiopia.

Furthermore, the outcomes of this study will provide critical knowledge regarding IMNCI implementation to interested stakeholders (policymakers, MOH, and Regional Health Biro) for evidence-based decision-making in IMNCI implementation in Ethiopia. Moreover, it benefits future researchers who will use this research as a reference for new or further studies.

2. LITERATURE REVIEW

2.1 Magnitude of Under-five mortality

The implementation of IMNCI is crucial to reducing under-five mortality and morbidity since IMNCI tackles the key causes of under-five morbidity and mortality, which account for more than 90% of the under-five mortality rate in Ethiopia(18).Mortality rate of children is one of the indicators of the socioeconomic status of any given country even though the majority of developing nations are unable to address the causes of child morbidity and mortality due to the availability of poor public health measures and a lack of access to healthcare facilities(19). Though significant advancements in child survival were seen globally between 1990 and 2010, with a 37% decrease in under-five mortality an estimated 6.3 million children and young adolescents died in 2017, the majority from diseases that can be avoided in childhood. 5.4 million (85.7%) of these deaths were in children under the age of five(20).

The global U5MR decreased by 59% from 93 deaths per 1000 livebirths in 1990 to 37·7 in 2019, while the annual number of global under-5 deaths declined from 12·5 million in 1990 to 5·2 million in 2019, which is a 58% reduction. Similarly the global NMR decreased by 52% from 36·6 deaths per 1000 livebirths in 1990, to 17·5 in 2019, and the annual number of global neonatal deaths declined from 5·0 million in 1990, to 2·4 million in 2019, a 51% reduction. As ++of 2019, 122 of 195 countries have achieved the SDG U5MR target, and 20 countries are on track to achieve the target by 2030, while 53 will need to accelerate progress to meet the target by 2030. 116 countries have reached the SDG NMR target with 16 on track, leaving 63 at risk of missing the target. If current trends continue, according to a systematic analysis by the UN Inter-agency Group for Child Mortality Estimation 48·1 million under-5 deaths are projected to occur between 2020 and 2030, almost half of them projected to occur during the neonatal period. If all countries met the SDG target on under-5 mortality, 11 millionunder-5 deaths could be averted between 2020 and 2030(21).

In 2019, children under the age of five accounted for 70% of deaths among children and youth under the age of 25, worldwide. 2.4 million Deaths occurred among children under the age of five. Infectious diseases such as pneumonia, preterm birth, and intrapartum complications are the leading causes of death for these children(22).The world has made substantial progress in

improving child survival in the past 25 years. Only five nations accounted for nearly half (49%) of all under five deaths in 2019: Nigeria, India, Pakistan, the Democratic Republic of the Congo, and Ethiopia. The average under five mortality rate in sub-Saharan Africa in 2019 was 76 deaths for every 1,000 live births. This equates to one child out of every thirteen death before turning five(23). Despite several efforts to reduce the number of death in children under the age of five, Sub-Saharan Africa continues to have the highest mortality rate in the world(24).

Moreover, Ethiopia has one of the highest under-5 child mortality rates in the region, with malnutrition underlying 28% of all child deaths(25). According to the 2019 mini-EDHS the infant mortality rate in the five years before the survey was 43 deaths for every 1,000 live births. The overall under-5 mortality rate was 55 deaths per 1,000 live births, while the child mortality rate was 12 deaths per 1,000 children who lived to be 12 months old. There were 30 neonatal fatalities for every 1,000 live births, and 13 post-neonatal deaths for every 1,000 live births. Additionally, according to the 2019 EMDHS findings, practically all child death rates have declined over time. In the 10–14 years (2005–2009) preceding to the survey, the under-5 mortality rate, for instance, decreased from 87 deaths per 1,000 live births to 55 deaths per 1,000 live births in the 0–4 years before the study(9).

2.2. Intagrated managment of neonatal and childhood illness Implementation

The study conducted in Pusksmans, Indonesia found that the implementation of the IMNCI in the area is 76% and only 65% implemented the IMNCI strategy for all visiting children. The study further revealed that of 52% of Pusksmans that had implemented IMNCI for more than six months 31% did not apply it for all children(26)

According to the Benin study, 63.6% of children were treated according to IMNCI standards, however individual health workers' performance varied significantly, with 15-88% of children correctly treated. A comparable study conducted in Kenya revealed that the region's use and implementation of IMCI principles is approximately 14%, which is lower than the normal WHO and UNICEF criteria (above 68%). Similarly, a study in Ghana found that despite numerous efforts by stakeholders to improve the quality of utilization, IMNCI implementation remained inadequate(27–29).

An institution-based cross-sectional study conducted in North Shewa, Ethiopia found that 58% of IMNCI implementation was at a high level and 42% was at a low level(30).

Another study conducted in Shire, Ethiopia on the implementation of IMNCI found as only nearly 63% were correctly classified, 57% correctly treated and only 24% have given appropriate appointment according to the IMNCI guideline and concluded a poor overall consistency of IMNCI management in the area(31).

2.3. Factors affecting the implementation of IMNCI

2.3.1 Health professional related factor

Training and maintaining sufficient numbers of competent health care workers in IMNCI is critical to the success of implementing IMNCI well(32). However as a study conducted in Puakesman, Indonesia revealed only 43% of health workers assigned in the child care unit had received the IMNCI training and from them 58% only conducted on the job training(26). Another study conducted in West Arsi found a better improvement in training when compared with that of the Indonesian though they found still works needed to scale up the trained health workers in the area. As there study revealed almost 58% of the nurses got training and of them 51% attended on job training(33).

Regarding to the experience of the health professionals according to a research conducted in Limpopo province, South Africa 37% of those working in IMNCI area had at least a 10 years' experience and those had more than 5 years' experience became 86%..In addition according to the study nearly more than half of the professionals has a diploma level followed by a degree level by 41%(34).

One issue that affected implementation was the way that health professionals perceived about IMNCI. In this context, a study carried out in North Shewa revealed that a key impediment to the implementation of the IMNCI was a lack of positive attitude among the study participants (11.9%). Also. health professionals those who refer booklet were 2.7 times more implemented the IMNCI than their counterpart(30).Related with their attitude poor adherence to IMNCI case management procedures regarding the prescription of antibiotics is the other notable obstacle in implementation of IMNCI. A scoping review by global health action showed that as IMCI-trained HCWs do not always follow the guidelines. As the review found physicians with higher

levels of pre-service training tended to prescribe more antibiotics to children, since they felt that the guidelines were only suggestions and not binding guidance(35).

Furthermore another analytical insight done in south Africa province found insufficient staff numbers, inappropriate staff allocation and rotation, and difficulties in maintaining competency as a stumbling block for the implementation of IMNCI(34).

2.3.2 Health System Related factor

According to studies done at Puskmans, Indonesia, the implementation of IMNCI was impacted by factors related to the health system, including the availability of necessary medications and equipment, the layout and infrastructure of healthcare facilities, human resources, the governance and management of health sector leaders, and political commitment to IMNCI. According to the study the availability of essential IMNCI drug were only 19% and essential equipment's for the IMNCI was also 15%.furthermore only 22% of pusksmans had even a special room for IMNCI(26). Likewise a study conducted in India indicated that inadequate availability of essential drugs is one of the major factors affecting the implementation of IMNCI(36).Moreover the study conducted in west Arsi also confirms this as the absence of critical drugs and supplies as another obstacle by 44%(33).

Another study conducted in Kenya found that economic, facility type, and insufficient stakeholder support are the major factors that affect the implementation of the IMCI strategy. Studies conducted in Ethiopia likewise revealed that the main obstacle to the implementation of IMNCI as it was connected to health facilities. According to a study done in West Arsi, shortage of medications was reported was one of the hindering factor for the implementation of IMNCI in 57% (33).

Regarding continuous follow-up and supervision from the higher bodies, studies conducted on the implementation of IMNCI revealed a gap. A desk review done by Momentum reported that only 15% of 66 first-level health facilities in 66 countries received more than one supervisory visit in the six-month duration, as they cited a global implementation survey of IMNCI conducted in 2018(32).Similarly according to a study conducted in puskmans, Indonesia 30% of the heads of pusksmans never have received any supervisory visit from the district health office(26).Likewise a study done in West Arsi Ethiopia also found as 89% of health care providers were not getting any supervision from the time they had training(33).

Furthermore, in South Africa, Pandya a qualitative insight on Health system factors affecting implementation of integrated management of childhood illness (IMCI) concluded that the lack of clarity of roles and accountability among various stakeholders were critical components of IMCI implementation failure(37).Moreover according to a study done in Ghana, the workload brought on by the increased patient load was the cause of to not complete all the examination according to the IMNCI guidelines. In this instance, clinical judgment is employed to determine which patients should have both an urgent evaluation and a more thorough IMCI assessment(29).

2.3.3. Other factors

The specific characteristics of the IMNCI strategy itself, the amount of time spent in consultations, and the demand-side factor the ratio of people using the healthcare system to the number of medical professionals providing service all have an impact on how well IMNCI is implemented.

According to a survey done in West Arsi, only around 28% of nurses were aware of the IMNCI approach and the common childhood illnesses where the IMNCI recommendations need to be tracked. 86.5% of these knowledgeable nurses were frequently familiar with the IMNCI technique(17).

In general, though different studies conducted around the world on the implementation of the IMNCI strategy and factors influencing its execution with various recommendations, but there are still gaps that show the strategy's implementation is inadequate, especially in low resource setting countries like Ethiopia.

2.4. Conceptual Framework

Conceptual frame work describing IMNCI implementation with factors selected from different literature *(23,33,37)*

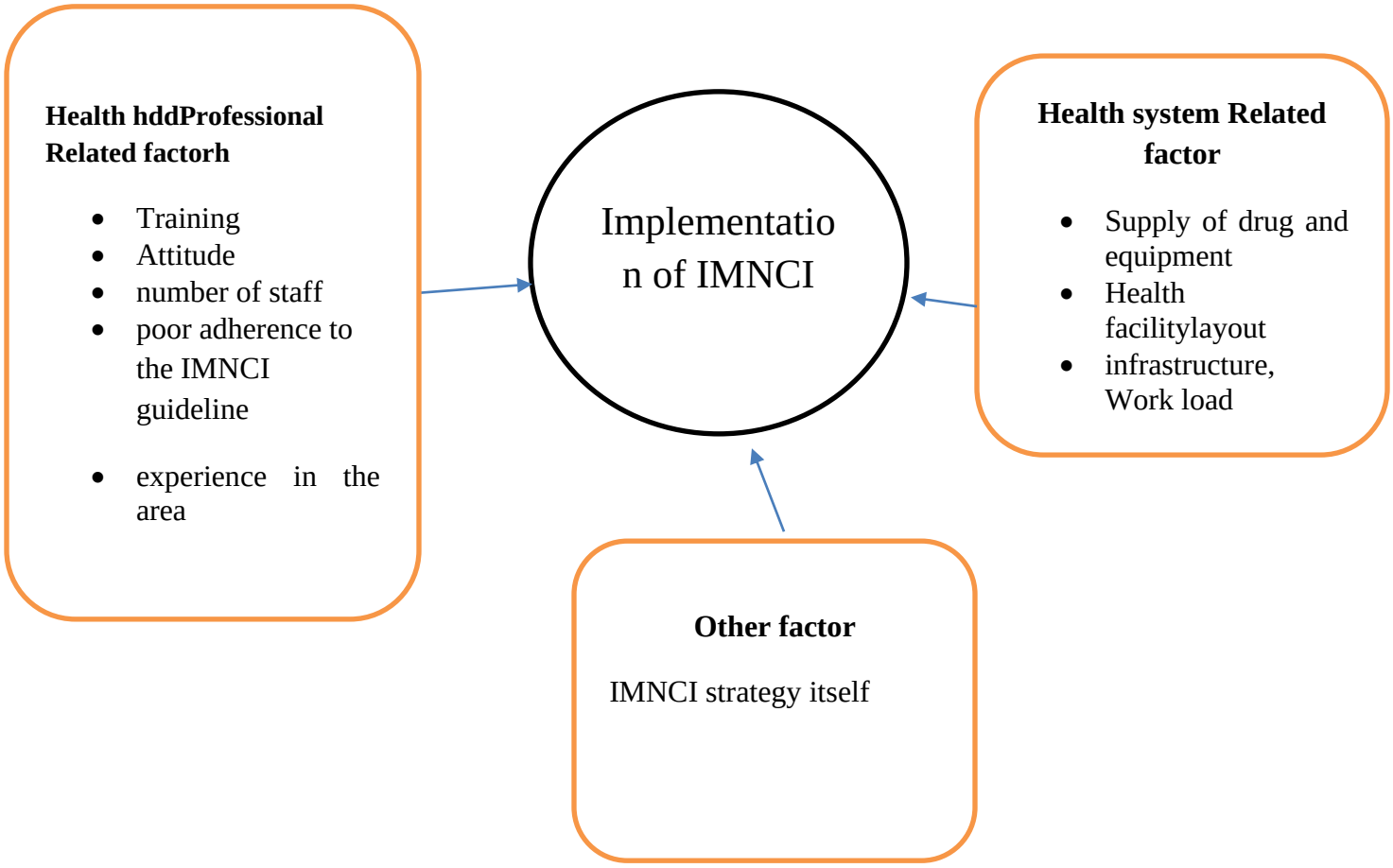

Figure 1: Conceptual framework of assessment of the implementation of integrated management of neonatal and childhood illness Adopted from different studies

3. OBJECTIVES OF THE STUDY

3.1 General objective

- To assess the Implementation of Integrated Management of Neonatal and Childhood Illness and its associated factor in Health Centers, East Shewa.

3.2. Specific objectives were

- To determine the implementation of IMNCI and its associated factor by health professionals in health centers
- To identify factors affecting the implementation of IMNCI and its associated factor by health professionals in health centers

4. METHODS AND MATERIALS

4.1. Study area and Period

The study was conducted in the health centers of four towns in East Shewa. The East Shawa Zone is one of the zones located in central Oromia. The zone has 12 woreda administrations and 12 town. The study was conducted in four towns: Adama, Bishoftu, Dukam, and Mojo, which were among the major towns in the zone. There are 20 health centers in this town that provide health services to its inhabitants. The study was conducted from November,2022 to June 2023 at health centers in East Shawa Zone, Ethiopia.

4.2. Study design

facility based cross sectional study was conducted.

4.3. Population

4.3.1 Source population

All health care professionals working in under five clinic of health centres in East Shewa

4.3.2 Study Population

All health care professionals who are working in under five clinic of selected health centres during data collection period.

4.4. Eligibility Criteria

4.4.1. Inclusion Criteria

The study include all health professionals who are working in selected health centers at least for more than one month and who are willing and consented to participate in the study.

4.4.2. Exclusion Criteria

Health professional (Laboratory technician, pharmacist. etc) who never worked in under five clinics.

4.5. Sampling Methods

4.5.1 Sample size determination

The sample size was calculated using a single population proportion formula in Epi-info version 7 based proportion of implementation take from study conducted in North Shewa Zone, Amhara Region(38) by using 95% CI and 5% degree of precision.

$$n = \frac{\left(z\alpha/_2\right)^2 p(1-p)}{d^2}$$

Where n desired sample size, $z\alpha/_2$ critical value at 95% CI (1.96), p proportion of implementation of IMNCI (0.58) and d degree of precision

n = 374

The number of health professionals working in selected health centers is 250. Since this number is below 10,000, we will employee correction formula to obtain final sample size.

$$n_f = \frac{n}{1 + \frac{n}{N}}$$

Where, n_f is final sample size, n is calculated sample size and N is number of health professional working in under five services (250). Hence, n_f=150. Then considering 10% non-response rate to adjust sample size the final sample size will be 165.

4.5.2. Sampling Techniques and procedure

The sample size was proportionally allocated to the selected town and health centers in East Shewa based on number health centers and health professionals in health centers as indicated in figure below. Then, simple random sampling method was used to select the health professionals from each health center.

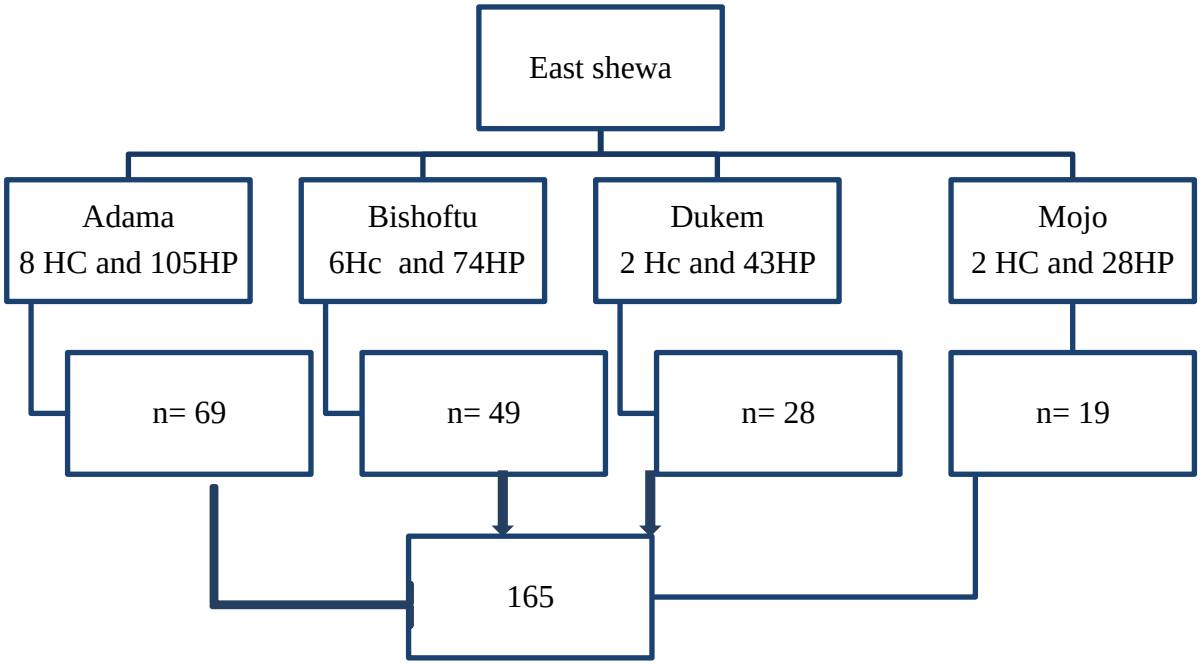

Figure 2: Schematic presentation of sampling procedure for the study.

4.6. Study variables

4.6.1. Dependent Variable

IMNCI implementation

4.6.2. Independent Variables

- Socio-demographic characteristics
- Health professional related factors
- Health facilities related factor
- Other factor related to IMNCI

4.7. Operational Definitions

Intgrated managment of neonatal and childhood illness Implementation-is the application of the strategy or the guidelines in a comprehensive and holistic manner. The implementation was assessed using a self-report questionnaire of implementation of IMCI components. Health professionals with an overall score above the mean were categorized as implementing IMNCI, and those below the mean were categorized as not implementing IMNCI.(38)

Attitude of health professionals toward IMNCI

Positive Attitude: All health professional who scored more than or equal to mean in attitude questioners.

Negative Attitude: All health professional whose mean scored are less than mean in attitude questioners.

4.8. Data Collection tools and procedures

4.8.1 Data Collection tools

A data collection tool adapted from a similar study was used to collect all the necessary variables(16,17,38–40). A structured questionnaire prepared using the English language was used to collect data since all study participants are literate (health professional). The questioner was in line with the objective of the study and it include variables like socio-demographic, Health professional related factor, Health facility related factor and another factor related to implementation of IMNCI. Furthermore, IMCI component implementation questioner was used to assess the implementation of IMNCI strategies.

4.8.2 Data Collection Procedure

The data was collected from health care professional working in under five of selected health centers between February to march, 2023, for a period of around one month. The information was gathered through self-administered questioner. With the researcher's careful supervision, two data collectors facilitate data gathering from respondents.

4.8.3 Data quality assurance

To enhance the quality of data, two days training were given for data collectors (Appendix IV lesson plan for the training). The questionnaire was pre-tested on 5% health care professionals in other health care facility before the main study and appropriate modification was made based on pre-test which was done in 2 health centers in Addis Ababa, after pre-test ambiguous questions were edited and checked for validation.

4.9. Data analysis

The data was checked for completeness and entered into Epi-Info version 3.1, which was later exported to SPSS version 26 for analysis. Descriptive statistics were performed to summarize the data and explain the study variables. Then the data is presented using a table, bar graph, or pie chart accordingly. Bivariate and multiple variable logistic regression analysis were conducted to assess factors affecting the implementation of IMNCI. The p-value and 95% confidence interval (CI) were used to judge the significance of the associations. A p-value of less than 0.05 was considered statistically significant.

4.10. Ethical considerations

Ethical clearance was obtained from the Institutional Review Board (IRB) of the College of Health Sciences, Addis Ababa University. (CHN/NSG/230) Written informed consent was obtained from all study participants. Individual information were kept confidential by avoiding possible identifiers such as the names of the study participants.

4.11. Dissemination of the findings

The findings of the study will be communicated to all concerned bodies including AAU, CHS, different levels of health offices and policy makers. It will also be available to the international scientific community through publication on reputable scientific journal.

5. RESULT

5.1 Socio-demographic characteristics

In this study, 155 study participants were involved, with a 94% response rate. Of these, 92 (59.4%) are female. The age range of the respondents was 23 to 41, with a mean of 32.8 (SD + 4.2 (33)). The majority of study participants were married and Orthodox in religion (70 (45.2%) and 60 (38.7%), respectively. Regarding level of education, 102 (65.8%) had a BSc degree, as indicated in (Table 1).

Table 1: Socio-demographic characteristics of study participants

Characteristics	***Category***	***Frequency***(N=155)	***Percent***
Sex	Male	63	40.6
	Female	92	59.4
Age in year	23-29	37	23.9
	30-36	85	54.8
	37-41	33	21.3
Religion	Orthodox	60	38.7
	Muslim	53	34.2
	Protestant	42	27.1
Marital status	Single	54	34.8
	Married	70	45.2
	Divorced	18	11.6
	Widowed	13	8.4
Level of qualification	MSc	23	14.8
	BSc	102	65.8
	Diploma	30	19.4

5.2 Health professional related factors

The years of service as a health provider range from 1 to 20, with a mean (+SD) of 10 (+5.34). The mean (+SD) year of service in under five was 4.1 (+3.26). The majority (113, or 72.9%) of health professionals attended IMNCI training. Among those who took training, 87 (77%) took in-service training, 51 (45%) have attended training in the past two to three years, and 51 (45.1%) have attended training for five to ten days. 54 (47.8%) of those who attended IMNCI training received follow-up training, while 44 (38.9%) did not. Among those who received follow-up training, 25 (56.8%) attended training in the past two to three years. Regarding the attitude of health professionals toward the IMNCI strategy, 95 (61.3%) had a positive attitude, as shown in (Table 2).

Table 2: Health Professionals related factors toward IMNCI implementation among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023.

Characteristics	***Category***	***Frequency***	***Percent***
Attend IMCI training	No	42	27.1
	Yes	113	72.9
IMNCI training received (N=113)	Pre-service	26	16.8
	In Service	87	56.1
Training received with in past (N= 113)	In Past one Year	32	28.3
	In past two to three years	51	45.1
	More than four years	30	26.5
Duration of training (N= 113)	Less than Five days	25	22.1
	Five to ten days	51	45.1
	More than ten days	37	32.7
IMNCI follow up training (N= 113)	No	69	61.1
	Yes	44	38.9
Follow up Training received with in past(N=44)	In Past one Year	19	43.2
	In past two to three years	25	56.8
Attitude toward IMNCI strategy(N=155)	Negative attitude	60	38.7
	Positive attitude	95	61.3

The main challenges in the implementation of the IMNCI strategy reported by health professionals were a shortage of staff (48.3%) and untrained staff (39.2%), as indicated in (Figure 2).

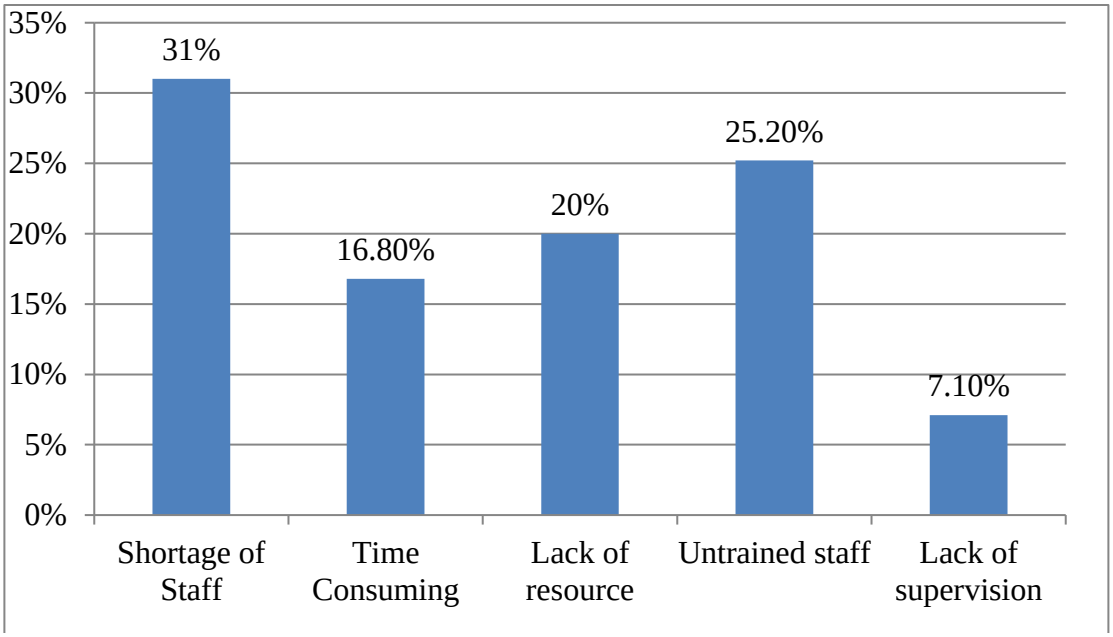

Figure 3: Bar Chart showing the main challenge in implementation of IMNCI among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023

5.3 Health System related factor

The majority 129 (83.2%) of participants mentioned that there is an organizational policy that encourages the implementation of IMNCI. The majority 105 (67.7%) and 112 (72.3%) of the respondents stated the number of staff in under five is not conducive to implementing IMNCI and the patient nurse ratio doesn't allow the use of the IMNCI strategy, respectively. 130 (8.9%) and 146 (94.2%) of respondents stated the availability of the IMNCI guideline and wall chart, respectively. Regarding availability of supply, 96 (61.9%) mentioned availability of essential drugs, and 29 (18.7%) mentioned that the health center is fully equipped to support the use of the IMNCI strategy. 87 (56.1%) of respondents mentioned that the clinical space is not adequate to implement IMNCI activities (Table 3).

Table 3: Health System related factors toward IMNCI implementation among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023

Characteristics	***Category***	***Frequency (N=155***	***Percent***
Organizational policy encourage IMNCI implementation	No	26	16.8
	Yes	129	83.2
Number of staff in under five is conducive to implement IMNCI	No	105	67.7
	Yes	50	32.3
Patient nurse ratio allow use of IMNCI strategy	No	112	72.3
	Yes	43	27.7
IMNCI guideline available in Health center	No	25	16.1
	Yes	130	83.9
IMNCI wall chart available	No	9	5.8
	Yes	146	94.2
Essential drug for IMNCI available in stock	No	59	38.1
	Yes	96	61.9
Health center fully equipped to support use of IMNCI strategy	No	126	81.3
	Yes	29	18.7
Clinical space adequate for implementation of IMNCI activities	No	87	56.1
	Yes	68	43.9

5.4 IMNCI Implementation

1. Integrated management of neonatal and childhood illness implementation from Birth-2 Month

The majority (80, or 51.6%) of respondents reported checking for new born asphyxia sometimes, while only 22 (14.2%) checked rarely. Most of the 85 (54.8%) and 69 (44.5%) health professionals always check for severe disease and birth weight, respectively. 77 (49.7%) and 100 (64.5%) health professionals reported checking for jaundice and diarrhoea sometimes. Regarding HIV exposure and infection, 79 (51%) check rarely and 74 (47.7%) check sometimes. 96 (61.9%) and 94 (60.6%) of health professionals reported checking feeding problems and immunization status sometimes. The majority of 90 percent (58.1%) of health professionals reported checking development status rarely, as indicated (Figure 4).

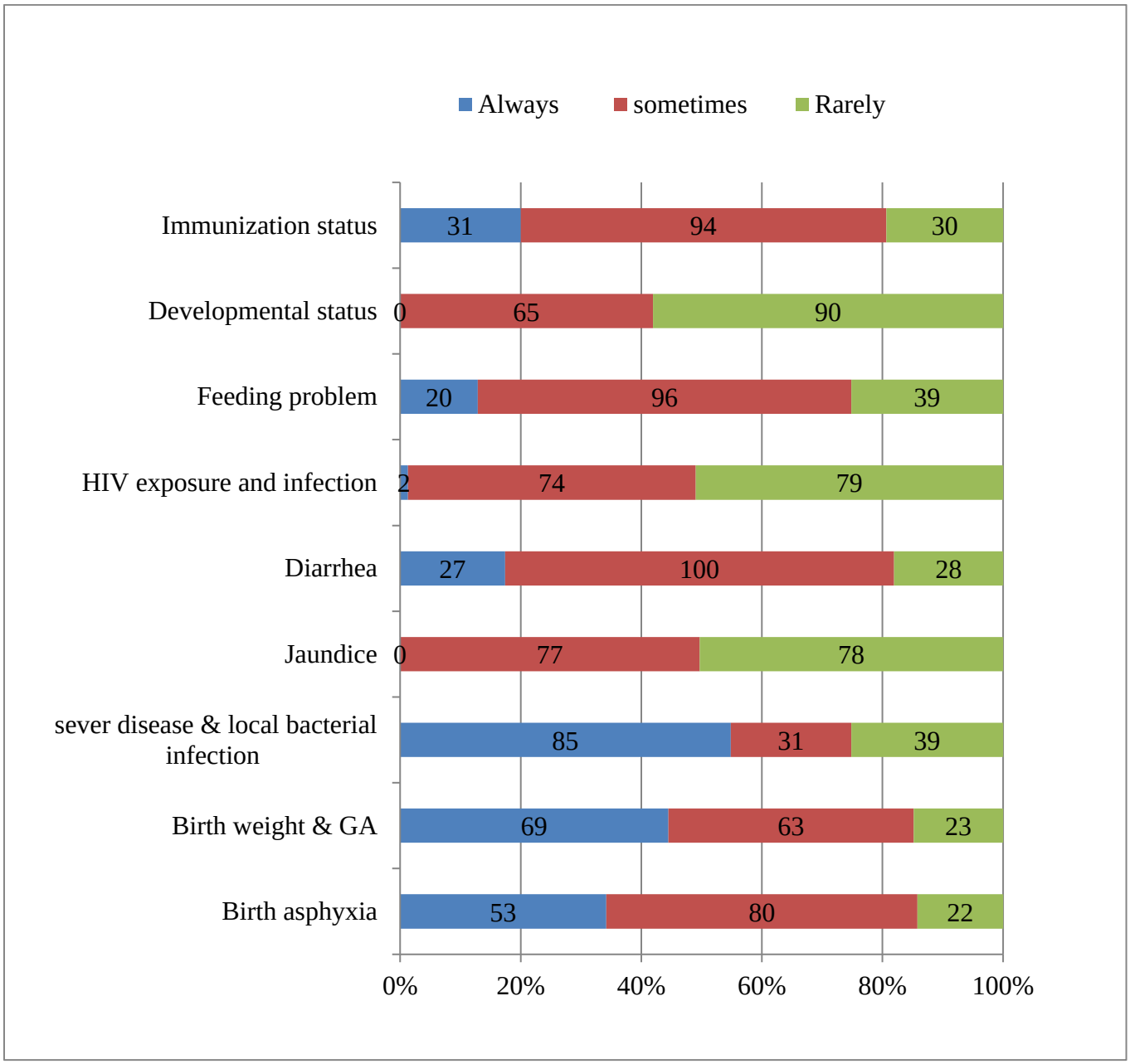

Figure 4: Stacked Bar Chart showing Implementation of IMNCI for Birth to 2 Months among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023

Integrated management of neonatal and childhood illness implementation from 2Months-5 Years

The majority of health professionals, 102 (65.7%) and 93 (60%), always check for general danger signs and fever, respectively. 97 (62.6%), 112 (72.3%), and 101 (65.2%) of health professionals reported they sometimes check for diarrhoea, anaemia, and feeding assessments, respectively. The majority (137, 88.4%), 91 (58.7%), and 134 (86.5%) of health professionals reported they rarely check for TB, the development of children between 2 and 24 months, and ear problems, respectively. Among study participants, 91 (58.7%) and 82 (52.9%) of health professionals reported checking for HIV exposure and infection for 2–18 months and 18–59 months sometimes, respectively. The health professionals reported that they rarely check the development status of children between 24 and 65 months. The majority of respondents (121, or 78.1%) reported checking for immunization and vitamin status sometimes (Figure 6).

IMPLEMENTATION OF IMNCI STRATEGY AMONG HEALTH PROFFESIONAL WORKING IN HEALTH CENTERS OF EASTSHEWA.

Overall, 69% of health professionals implement IMNCI in both age groups while 31% do not. (Figure 5)

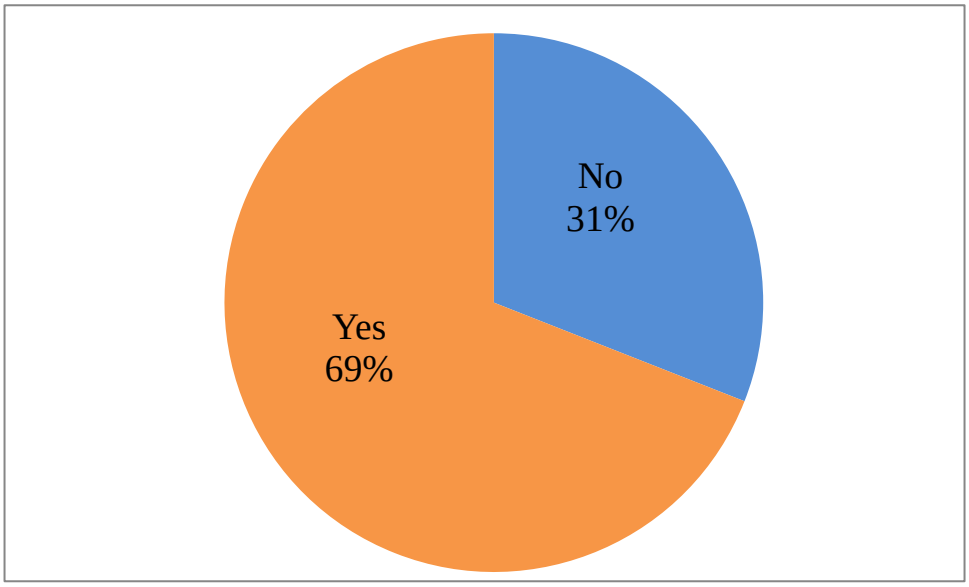

Figure 5: Pie Chart showing implementation of the IMNCI strategy among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023

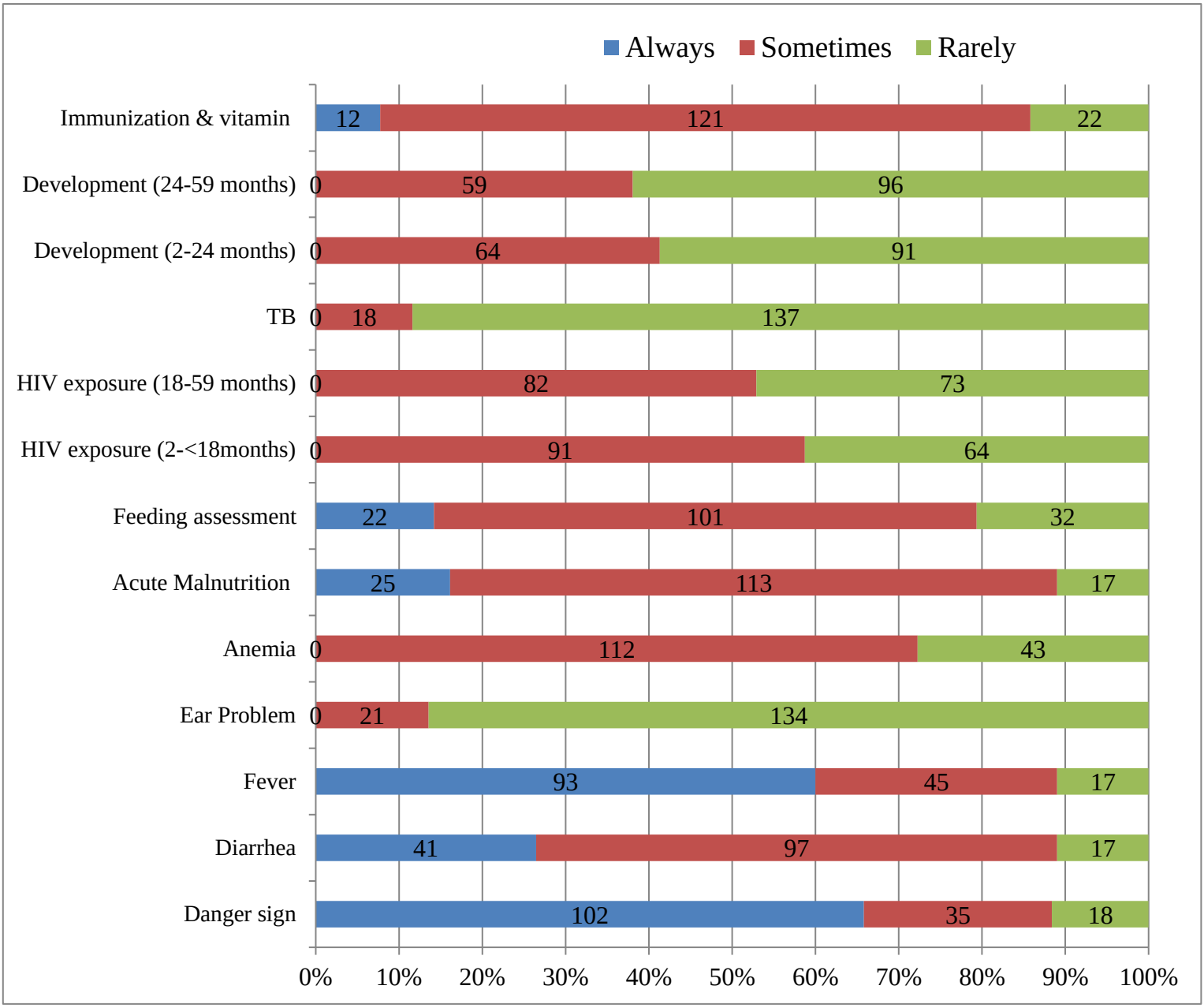

Figure 6: Stacked bar chart showing implementation of IMNCI for 2 months to 5 years among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023

5.5 Factor associated with IMNCI Implementation

In binary regression, variables with a p-value less than 0.25, such as age group, level of qualification, year of service, attended IMNCI training, attitude toward IMNCI strategy, patient-nurse ratio that allows use of IMNCI strategy, essential drug for IMNCI available in stock, and clinical space adequate for implementation of IMNCI activities, were accepted as candidates for a multivariable logistic regression model. However, in a multivariable logistic regression model, level of education, age group, attendance at IMNCI training, and attitude toward IMNCI strategy were significantly associated with implementation of IMNCI at a p value less than 0.05.

Health professionals with an MSc degree level of qualification implement IMNCI strategies 4.79 times more likely (AOR 4.79; 95% CI = 1.147–20.061) than those with diploma qualifications. Health professionals with a BSc degree level of qualification implement IMNCI 3.49 times (AOR 4.79; 95% CI = 1.194-10.21) more likely than those with a diploma.

Health professionals in the age group of 30-36 implement IMNCI strategies 74.5% less likely (AOR 0.255; 95% CI = 0.070–0.925) than those in the age group of 37–41 years. Health professionals who haven't attended IMNCI training are 83.8% (AOR 0.162; 95% CI = 0.061–0.426) less likely to implement than their counterparts. Furthermore, health professionals who have a negative attitude toward IMNCI strategies are 82.2% less likely (AOR 0.178; 95% CI = 0.069–0.461) to implement IMNCI than those with a positive attitude.

Table 4: Factors associated with IMNCI strategy implementation among health professionals working in health centers in East Shewa, Oromia region Ethiopia, 2023

Variable	***IMNCI Implementation***		***COR (95% CI)***	***P***	***AOR (95% CI)***	***P- value***
	No (n)	**Yes(n)**				
Level of qualification						
MSc	7	16	2.612(0.834-8.181)	0.099	4.79(1.147-20.061)	**0.032***
BSc	25	77	3.520(1.508-8.214)	0.004	3.492(1.194-10.21)	**0.022***
Diploma	16	14	1		1	
Age group						
23-29	11	26	0.422(0.129-1.379)	0.153	0.321(0.050-2.071)	0.232
30-36	32	53	0.296(0.104-0.843)	0.023	0.255(0.070-0.925)	**0.038***
37-41	5	28	1		1	
Attended IMNCI training						
No	33	54	0.174(0.081-0.374)	<0.001	0.162(0.061-0.426)	**<0.001***
Yes	15	53	1		1	
Attitude toward IMNCI strategy						
Negative attitude	30	30	0.234(0.114-0.481)	<0.001	0.178(0.069-0.461)	**<0.001***
Positive attitude	18	77	1		1	
Patient nurse ratio allow use of IMNCI strategy						
No	40	72	0.411(0.174-0.972)	0.043	0.488(0.147-1.615)	0.240
Yes	8	35	1		1	
Essential drug for IMNCI available in stock						
No	25	34	0.428(0.213-0.861)	0.017	0.479(0.199-1.158)	0.102
Yes	23	73	1		1	
Clinical space adequate for implementation of IMNCI activities						
No	33	54	0.463(0.226-0.950)	<0.036	0.435(0.176-1.075)	0.071
Yes	15	53	1		1	
Year of service [a]			1.081(1.010-1.157)	0.025	1.004(0.880-1.145)	0.954

[a] Continuous variable; * significant at $P< 0.05$; COR, crude odds ratio; AOR, adjusted odds ratio.

6. Discussion

The study aimed to assess the implementation of the integrated management of neonatal and childhood illness (IMNCI) program in health centers in East Shewa.

The findings of this study revealed that 69% of health professionals in selected health centers are implementing the IMNCI strategy. This finding is comparable to other studies conducted in West Africa (63%), Benin (63.6%), and Indonesia (65%). Additionally, the findings of this study are consistent with the WHO and UNICEF criteria for effective IMNCI implementation (above 68%) (26,33).

The study finding is higher than studies conducted in North Shewa (58%) and Kenya (14%). This difference could be due to the fact that more (72.9%) health professionals in our study attended IMNCI training, while only 57.7% of health professionals in North Shewa had received training and in Kenya 79% of respondents did not receive comprehensive IMCI training or follow-up(28,38).

The findings of this study suggest that academic qualification is significantly associated with the implementation of IMNCI strategies. Health professionals with MSc degree level of qualification were 4.79 times more likely to implement IMNCI strategies than those with diploma qualification. Similarly, health professionals with BSc degree level of qualification were 3.49 times more likely to implement IMNCI strategies than those with diploma qualification. Similar studies in Namibia, Kenya Tanzania and Uganda have also reported a positive association between academic qualification and the implementation of IMNCI strategies. Health professionals with higher levels of academic qualification were more likely to adhere to use IMNCI-recommended practices(16).

This could be justified by the fact that as academic qualification increases, the knowledge and skills in IMNCI strategies also increase. IMNCI is intervention that requires a broad range of knowledge and skills, including the ability to assess children's health status, diagnose and treat common childhood illnesses, and provide counseling and support to families. Health professionals with higher levels of academic qualification are more likely to have the knowledge and skills necessary to implement IMNCI strategies effectively(5,41,42).

The study revealed that health professionals in the age group of 30-36 are 74.5% less likely to implement IMNCI strategies than those in the age group of 37-41. This could be due to the fact that as age increases, experience, confidence, and motivation may increase. Hence, health professionals with more experience may be more familiar with IMNCI strategies, which give them more confidence and motivation to use IMNCI strategies.

In addition to the factors mentioned above, it is also possible that the lower use of IMNCI strategies by health professionals in the age group of 30-36 is due to a lack of awareness of the benefits of these strategies. This study showed that 37% of health professionals in this age group did not attend IMNCI training. IMNCI strategies have been shown to be effective in reducing child mortality and morbidity. However, many health professionals may not be aware of these benefits, or they may not be confident in their ability to use IMNCI strategies.

A study found that health professionals who did not attend IMNCI training were 83.8% less likely to implement the IMNCI strategy than health professionals who did attend the training. This finding is consistent with a study conducted in North Shewa and West Arsi, which found that IMNCI-trained health professionals were 2.7 times more likely to implement the IMNCI strategy. The study findings suggest that IMNCI training is an effective way to improve the implementation of the IMNCI strategy. This is important because the IMNCI strategy has the potential to save millions of lives each year. Similar study in Afghanistan also showed that IMNCI training enhanced the quality of care for under five children(43).

The study revealed that health professionals who have a negative attitude towards IMNCI strategies are 82.2% less likely to implement IMNCI than those with a positive attitude. This finding highlights the importance of health professional attitude in the implementation of IMNCI.

The study findings are consistent with similar studies in which it has been reported that attitude towards IMNCI strategy affects implementation of IMNCI. For example, a study in South Africa, found that health workers with a negative attitude towards IMNCI were less likely to use the strategy and less likely to provide quality care to sick children. The positive attitude among the majority of the health care workers helps them to implement it irrespective of the associated challenges. Attitude towards IMNCI strategy is important for its implementation because it

affects the way health workers perceive, interact with parents and caregivers, and provide care to sick children. Specifically, a positive attitude towards IMNCI can lead to health workers believing in its effectiveness, being patient and understanding with parents and caregivers, and following the IMNCI guidelines to provide the best possible care to sick children(39,40,44).

7: STRENGTH AND LIMITATION OF THE STUDY

7.1 Strength of the study

The study has the following strength;

- The study provides a comprehensive overview of the implementation of the IMNCI strategy in a specific region of Ethiopia.
- The data were analyzed using a variety of statistical methods, including, bivariate, and multivariate analysis and identify number of factors that are associated with the implementation of the IMNCI strategy which can be used to improve the implementation of the IMNCI strategy in East Shawa and other regions of Ethiopia.
- The data collectors were trained on the research methods and procedures. This ensured that they were familiar with the objective and best practices for collecting data

7.2 Limitation of the study

Despite the strengths of this study, there are some limitations that should be considered.

- First, this was a cross-sectional study, which means that it could not show cause and effect relationships.
- Second, the results of this study were based on self-reported data from health care professionals. This type of data can be subject to social desirability bias, which means that participants may be more likely to report positive outcomes or to underreport negative outcomes.

Overall, this study provides valuable evidence about the IMNCI implementation in selected health center of East Shewa. However, the limitations of the study should be considered when interpreting the results.

8: CONCLUSION

The study found that 69% of health professionals in the study setting implemented IMNCI, which is acceptable and comparable to WHO recommendations. The study also found that level of qualification age group, IMNCI training, and attitude toward IMNCI strategies were significantly associated with implementation of IMCI.

These findings suggest that IMNCI implementation can be improved by increasing the level of qualification of health professionals, providing IMNCI training, and promoting a positive attitude toward IMNCI strategies. Additionally, the study found that health professionals who were older were more likely to implement IMNCI.

Overall, the study found that IMNCI implementation is acceptable in the study setting, but there is room for improvement. The findings of the study suggest that increasing the level of qualification of health professionals, providing IMNCI training and promoting a positive attitude toward IMNCI strategies can improve IMNCI implementation.

9. RECOMMENDATION

The following recommendation has been forwarded to all concerned bodies based on the study.

Policy maker

- It is better for the Ministry of Health (MOH), regional health bureaus, and concerned stakeholders increase the level of qualification of health professionals by providing more training and education opportunities that are specifically designed for health professionals with lower levels of academic qualification.

- It is suggested for health facilities and CPD centers enhance the provision of IMNCI training to all health professionals, regardless of their level of qualification. This can be done by integrating IMNCI training into continuing professional development programs.

- It is recommended for health offices and health facilities to address the negative attitudes of health professionals towards Integrated Management of Newborn and Child Illness (IMNCI) and promotes a positive attitude towards IMNCI strategies by highlighting the benefits of these strategies for children and families.

Health professionals

- It is better for health professionals seek to improve their qualifications.
- It is suggested to health professionals to seek out IMNCI training opportunities and continuously improve their knowledge and skills on IMNCI strategies.
- It is better for health professionals to address negative attitudes towards IMNCI strategies among their peers and promote a positive attitude towards these strategies.

Researchers

- Further qualitative studies need to be conducted to explore the barriers to the implementation of IMNCI, in order to develop tailored interventions that can enhance its implementation.

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APPENDIX

Appendix I. Participant Information Sheet/ Consent form for the Study

RESEARCH Title: Assessment of the Implementation of IMNCI and its associated factor in Health Centers at east shewa, Ethiopia

Researcher:Meti Bedassa

Dear Respondent:

I am a Master‘s student (ID number: GSR 4805/14) at Addis Ababa University, College of Health Sciences, School of Nursing Department of Pediatric and child Health

I kindly request you to participate in a study that is aimed at exploring the implementation of IMNCI strategy by the health professionals in health centers. The participation in this study is voluntary; you can also withdraw at any time from the study if you feel uncomfortable. Refusal to participate will not affect your work or care you shall seek at any of the health facilities in any way. Confidentiality will be ensured by not using your name or address on the questionnaire and final thesis report. There are no risks involved in participating in this study. The study has no immediate benefits to the respondents, but will have benefits later in improving the uptake of IMNCI service utilization among children and thereby help to reduce the burden of child morbidity and mortality. I welcome any question if you have any about the study and your participation. Should you have any questions about the research or any related matters, please contact the researcher at +251949383141

Email:metibedassa19@gmail.com

Appendix II. Consent sheet

I, the under signed, understand the nature of the study, benefits, my right to voluntary participation, confidentiality and withdrawal from the study without any victimization. I have had the opportunity to ask questions and answered to my satisfaction. I hereby freely consent to take part in this study. Signature of the participant_____ Date_____ Supervisor Name _____ signature_____ Date_____/_____/____E.C.

Name of interviewer Date _____/_____/_____E.C. signature_____

Your participation will be greatly appreciated. Yours Faithfully,

Appendix III. Questionnaire

PART 1: Socio-Demographic related Questionnaires nurses.

All questionnaires are completed anonymously. We would appreciate if you answer all the questions and answer as honestly as possible. Please circle on the number you select that best answers the question. Kindly make only one selection unless otherwise instructed.

Ser.no	Socio-Demographic	Response	Remark
101	Sex	1. Male 2. Female	
102	Age	___in years	
103	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Other(specify)_____	
104	Level of qualification	1. MSc 2. BSc 3. Diploma 4. Other (specify) ____	
105	Marital status	1. Married 2. Single 3. Divorced 4. Widowed 5. Separated	

Part 2. Health professionals related factor			
201	How long have you been serving as health care provider?		
202	Have you ever worked in a Paediatric ward or under five OPD?	1.Yes 2.No	
203	If yes to # 202, How long have you been serving in under five clinics?	_____ Years	
204	Have you attended IMNCI training?	1. Yes 2. No	
205	If yes to # 204, which IMCI training did you receive?	1.pre service training 2.in service	
206	When you last attended training (Year and month of training)?	month_____ year_____	
207	What was the duration of IMNCI training?	_____days	
208	Have you received IMCI follow-up training?	1. Yes 2. No	
209	If yes to # 208, When you last attendedfollow up training?	Month ---------- Year ---	
210	What are the main challenges encountered in implementing the IMCI strategy?	1. Shortage of staff 2. Time consuming 3. Lack of resource 4. Untrained staff 5. Lack of supervision 6. Lack of knowledge 7. Lack of good attitude 8. Others(specify)-----	

211	**Attitude toward IMNCI Strategy** To what extent do you agree with the following statements about IMCI strategy at your health facility?					
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
211.1	IMNCI has boosted my confidence and skills in Under 5 patient case management.					
211.2.	It has led to longer patient waiting queues because of the time spent to apply all the stages of the IMNCI case management protocol per under 5 patients.					

211.3	IMNCI is partially implemented because, if the IMCI trained nurses take too long assessing the under 5 patients, non-IMNCI trained nurses take over care of other children waiting in the queue					
211.4	IMNCI has reduced the number of follow-up visits by under 5 patients because of the thorough and accurate case management during initial visit.					
211.5.	It is not practical to always refer to the IMNCI chart booklet in the clinic during case management of every presentation.					
211.6	All IMNCI trained nurses at our health facility apply all the stages of the IMNCI protocol during case management of children under 5 years.					
211.7	Our health facility lay-out does not make it easy for us practice all the IMNCI skills like witnessing first dose treatment, rehydration corners etc.					
211.8.	The case management practices of IMNCI trained nurses and non-IMNCI trained nurses are inconsistent; hence caretakers of under 5s prefer to be seen by nurses who are not IMNCI trained.					
211.9	IMNCI is a user-friendly strategy for health workers					
211.10	IMNCI is easy to understand and apply					
211.11	IMNCI protocol is too long					
211.12	IMNCI protocol is tedious					
211.13	IMNCI is time-consuming					

	Part 3 Health System related factor		
301	Is their organizational policy that encourage implementation of IMNCI	1. Yes 2. No 3. Don't know	
302	How many health professionals are currently working in under-five	_____	
302	Do you think the number of staff in under five is conducive to implement IMNCI?	1. Yes 2. No 3. Don't know	
303	Does patient-nurse ratio allow for the use of IMNCI strategy	1. Yes 2. No 3. Don't know	
304	Is IMNCI guideline available in the health centre?	1. Yes 2. No	
305	Is their IMNCI wall chart available	1. Yes 2. No	
306	Is their essential drug for IMNCI available in stock	1. Yes 2. No	
307	Is your health centre fully equipped to support the use of be IMNCI-strategy procedures	1. Yes 2. No	
308	Is clinical space adequate for IMNCI activity	1. Yes 2. No	

PART.4. IMNCI Implementation

Birth -2 months					
		Not at all	Rarely	Sometimes	Always
401	Does the health professional check the new born for birth asphyxia?				
402	Does the health professional check for birth weight & GA(< 7 years)?				
403	Does the health professional check for sever disease & local bacterial infection?				
404	Does the health professional check for jaundice?				
405	Does the health professional check for diarrhea?				
406	Does the health professional check for HIV exposure and infection?				
407	Does the health professional check for feeding problem(underweight) breast feeding young infant?				

408	Does the health professional check for feeding problem not breast feeding?				
409	Does the health professional check for developmental status?				
410	Does the health professional check for immunization status?				
2 months -5 years					
401	Does the health professional check for general danger sign?				
402	Does the health professional check for diarrhea?				
403	Does the health professional check for fever?				
404	Does the health professional check for ear problem?				
405	Does the health professional check for anemia?				
406	Does the health professional check for acute malnutrition in infant<6months				
407	Does the health professional check for acute malnutrition 6-59 months?				
408	Does the health professional check if the child need feeding assessment?				
409	Does the health professional check for HIV exposure and infection(2-<18months)				
410	Does the health professional check forHIV exposure and infection(18-59 months)				
411	Does the health professional check for Tb?				
412	Does the health professional check for development of the child(2-24 months)?				
413	Does the health professional check fordevelopment of the child(24-65 months)				
414	Does the health professional check for immunization and vitamin status?				

Appendix IV: Training module for data collectors and supervisors

I.Instruction

- ♣ Identify target subjects to be interviewed
- ♣ Procedures to be followed during interview of subjects, care of use of non-leading questions
- ♣ When to interview/convenient time
- ♣ When to start data collection and when to end

II. Methods of training

- ♣ Pass through the instrument or data collection tool with data collectors to point out specific instructions

- ♣ Provide an example of a completed instrument or an interview transcript for the data collectors
- ♣ Allow data collectors to practice with the tool

Table: Training module manual

Data collection method Or instruction	Data collector	Training needs	Training activities
Health professionals in selected Health centers in East Shewa	BSc Nurses	Introduce GCP(good clinical practice) How to approach respondents How to distribute instrument	• Overview of study • Brief revision on GCP • Participant selection procedure • Role play on all procedure