

# Knowledge, Attitude and Practice of Mothers Toward Immunization of Their Infants in Shashemene Referral Hospital, West Arsi Zone, Oromia Regional State, Ethiopia

Yonas Gurmu<sup>\*</sup>, Gada Edea, Eniyewu Molla, Dirriba Tari, Elifitu Lamesa, Elsa Belay

Department of Nursing, College of Medicine & Health Sciences, Ambo University, Ambo, Ethiopia

## Email address:

yonasgurmu@gmail.com (Y. Gurmu)

<sup>\*</sup>Corresponding author

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**Abstract:** Background: Ethiopian was able to expand the immunization service by introducing new vaccines into the country routine immunization program that increased the number of antigens from 10 to 12. Expanded Program on Immunization (EPI) is one of the key programs in World Health Organization (WHO) Ethiopia under the Maternal, Child Health and Nutrition (MCHN). Compliance to vaccination may be influenced by understanding of the community towards the service. Objective: To assess the knowledge, Attitude and practice of mothers towards vaccination of their infants in Shashemene referral Hospital west Arsi, Zone Oromia Regional state, South-Ethiopia, 2018. Method: Institutional based cross-sectional study design was conducted in shashemene Referral Hospital from February to April 10, 2018. Face to face structured Interview questionnaire was used by systematic sampling techniques. Data collection was start from March 01 to 30, 2018 G. C and after reviewing, data was analyzing with SPSS software version 20. Result: A total of 228 mothers were participated on this study, giving the response rate of 98.1%. From the total respondents (52.3%) of mothers have good knowledge and (42.3%) of them had good practices of services utilization of vaccination for their infants. Conclusion: This study showed that 52.3%, 67.7%, 42.3% of study participant had good knowledge, attitude, and practice towards immunization of infants respectively. Educational interventions are required to improve parents' knowledge, attitude, and practice.

**Keywords:** Knowledge, Attitude, Practice, Immunization, Shashemene, Mothers

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## 1. Introduction

It is undeniable that vaccines have been an important part in preventive medicine based on their successes in controlling vaccine-preventable diseases in the developed world [1].

World Health Organization (WHO) estimated that annually up to three million children's lives are saved by vaccinations, but still another three million lives worldwide are lost from vaccine-preventable diseases. In 2009, WHO estimated that if global vaccine coverage increased to 90% by 2015, then approximately two million deaths of children under the age of five would be prevented [2].

Ten years later, in 1984, the WHO established a standardized vaccination schedule for the original EPI vaccines: Bacillus Calmette-Guerin (BCG), diphtheria-tetanus-pertussis (DTP), oral polio, and measles [3]. During the inception of Expanded

Program on Immunization the objective was to increase immunization coverage by 10% annually and reach 100% in 10 years but this target has not been realized even after two decades. The target group when the program started were children under two years of age until it changed to less than one year in 1986 to be in line with the global immunization target [4].

Ethiopia compressive multiyear plan 2011-2012. The EPI aims at delivering the primary immunization series to at least 90% infant. Maternal and child health are among the Ethiopia government priority health programs and efforts are being implemented to reduce maternal and child mortality [5].

In 2014, the Ministry of Health (MOH), in partnership with UNICEF, and other bilateral agencies, has intensified efforts to improve routine immunization at peripheral levels. Despite visible gains that have been recorded in the EPI program, the 2012 national Immunization coverage survey showed a lower

than reported coverage with wide regional variation and problems of drop outs. Not only this, but also knowledge, and practice of mother toward immunization is great role to eradicate the left 40% of unimmunized child and predisposing factor of missed opportunity of immunization [6].

All over the world vaccine preventable diseases still account for about 2 million death per year measles is the major killer of children accounting for 4,55000 deaths every year, despite a 48% reduction over the past six year, with most of those death occurring in the developing country. World Health Organization estimates 29% of death among children 1-59 month of age is vaccine preventable. Due to this WHO has estimated that if all the vaccines now available against childhood diseases were widely adopted, and if countries could raise vaccine coverage to a global average of 90%, by 2015 an additional two million deaths a year could be prevented among children under five years old [7]. According to EDHS 2016 Infants and under five children mortality rate has been a steady decline over the last 16 years [8, 9].

It is directed in the implementation guideline to introduce Inactivated Polio Virus (IPV), measles-rubella, meningitis, and yellow fever vaccines for less than one-year-old children [10].

Despite the fact that the government of Ethiopia has increased its efforts to enhance good immunization practices, however, vaccine preventable disease are still now one of the main health problems facing children in under-five age group and from 67 deaths per 1,000 live births majority of child death due to vaccine preventable disease in Ethiopia [11].

To fill those gaps, this study was assess the knowledge, attitude and practices of mother to ward immunization of their infants.

## 2. Method

Study was conducted at Shashemene referral Hospital. Shashemene referral Hospital is found in Shashemene warada (Kuyera town) it's situated 238 km away from Addis Ababa and 7km from Shashemene town in west Arsi zone of Oromia regional state, Ethiopia. The study was conducted from February to April 10, 2018. Institutional based cross-sectional study was conducted. All mothers who have less than or equal to one year infant who attended shashemene referral Hospital for immunization of their infants and give consents are included. Mothers who are unable to speak /hear are excluded.

Sample size was determined by the following formula using proportion of knowledge 55%, 95% CI. from previous research done at Addis Ababa Health center.

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

$$n = [1.96]^2 \times [0.55] \times [0.45] / [0.05]^2$$

$$= 380$$

The above sample was going to be taken from a relatively small population (<10,000), then the sample size has been adjusted as;

$$n = n_0 / (1 + n_0 / N)$$

$$= 380 / (1 + (380 / 450))$$

$$= 207$$

Then we take 10% of 207 as a contingency value as non-response during interview. Finally a total number of sample size of the study is 228

Where, n=desired sample

z=level of significance at 95% confidence interval

p=an estimate of the proportion of mother attending immunization for their infant in one month`

d=marginal error

N=total sample

### 2.1. Sampling Technique

Systematic sampling technique to select the study population. K-value equal to 2 (k=450/228=2). Every other mother was selected as a sample size. All mothers were come for immunization services at EPI unit for their under one year child selected as sample, until sample size was reached.

A total number of sample size of the study is 228. The structured questionnaire that measures the socio-demographic characteristics, knowledge, Attitude and practice of mothers towards immunization was used to collect the data. The structured questionnaire was adopted from English version after reviews of different literatures, Then it translates in to Afan Oromo and Amharic version in order to simplify the data collection procedure, and back to English, to check its consistency. Data was collected by nurse face to face interview using structured questionnaire.

### 2.2. Operational Definition

Good:-Those mothers who answer correctly the knowledge, Attitude, practice questions and if they score the mean value and above.

Poor:-Those mothers who answer correctly the knowledge, Attitude, practice questions and if they score below the mean value.

Data was collected by using pretested structured questionnaire by principal investigator. The questionnaire was further modified after a pre-test was conducted. The pre-test was done in out of the study area at Melka oda Hospital before started data collection The data was checked for the completeness, accuracy, and consistency at the end of every day. The data was checked for completeness, coded and entered then analyzed use statistical package for social science (SPSS) vervation 20.

Ethical clearance was obtained from the Ethical Review committee of Ambo University, College of Medicine and Health Science department of Nursing. Then verbal informed consent was obtain from responsible bodies in the Shashemene referral Hospital prior to data collection and after the purpose of the study was explained. Participant confidentiality was kept during interviews.

## 3. Result

Out of 228 respondents of had given a response to our questionnaire which accounts a response rate of 98.7%. Out

of this 50.4% of respondents were young women (21- 26 years). From the total of mothers participated, 36.3% were learned from grade 9-12. Majority of the mothers were married (98.7). From all mothers 54.4% were Muslim and 77.4% of them were house wife, 35.8% children were above two months. More than half of the respondent (56.6%) has average monthly income of greater than 1000 ETB.

About 42.3% of mothers were always bringing their infants for immunization according to the schedule given by health professionals (Table 4).

The level of education of mothers was observed to be very significant ( $p=0.003$ ) to their knowledge on immunization. The higher the level of education of the mother, the greater their knowledge on immunization.

**Table 1.** Socio demographic and related characteristics in shashemene referral Hospital, (n=226).

Characteristics	Frequency	Percent (%)	
Age of mother in (years)	15-20 years	47	20.8
	21-25 years	114	50.4
	26-30 years	47	20.8
	>31 years	12	5.3
Educational status of mother	unable to read and write	28	12.4
	able to read and write	13	5.8
	grade 1-4	12	5.8
	grade 5-8	57	25.2
Religions	grade 9-12	82	36.3
	Muslim	123	54.4
	Orthodox	51	22.6
	Protestant	47	20.8
Marital status of mothers	Others	5	2.2
	Married	223	98.7
	Divorced	2	0.9
Occupation of mothers	Widowed	1	0.4
	House wife	175	77.4
	Merchants	23	10.2
	Gov employed	28	12.4
House monthly income ETB	<500	9	4
	500-1000	55	24.5
	1000-5000	128	85
	>5000	34	15
Ethnicity	Oromo	193	85.4
	Amhara	23	10.2
	Tigray	2	0.9
	Others	8	3.5
Place of birth infants	At home	122	54
	At health institution	104	46
Age of infants	0-10 week	69	30.5
	11-14 week	81	35.8
	15 week-1 years	76	33.6

#### Knowledge of Respondents on Infant Vaccination and Vaccine Preventable Diseases

Of 226 respondents, 223 (98,7) have ever heard information about vaccination (Table 2).

**Table 2.** Knowledge of mothers regarding infants' vaccination in shashemene referral hospital 2018.

Characteristics	Frequency	Percent (%)	
Heard information about vaccination	Yes	223	98.7
	No	43	19.0
Where from hear	Health profession	117	51.8
	TV and Radio	74	32.7
	School friend	22	9.37
	From all	11	4.9
Infant should ever start vaccination	Just after birth	30	13.3
	After six week	181	80.1
	After two month	10	4.4
how many vaccination sessions are needed for a child to be fully protected	I don't know	5	2.2
	Three	15	6.6
	Four	161	71.2
	Five	30	13.3
Ages of infants to complete vaccination	Six	3	1.3
	Before one year	191	34.5
	After one year	30	13.3
	I don't know	5	2.2

Characteristics		Frequency	Percent (%)
Name of vaccine preventable disease	Measles tetanus TB pneumonia, dept, pertusis	208	92.0
	Only tetanus and measles	30	13
	Only TB and pneumonia	13	5.8
	I don't know	2	0.9
Number of vaccine preventable disease	More than two disease	203	89.8
	Single disease	3	0.13
	I don't know	20	8.8

*Attitude of Respondents To wards Immunization*

This study 67.7% of mothers had a favorable attitude towards immunization of their infants, summarized on (table 3)

**Table 3.** Attitude of mothers towards infants' immunization in Shashemene referral Hospital.

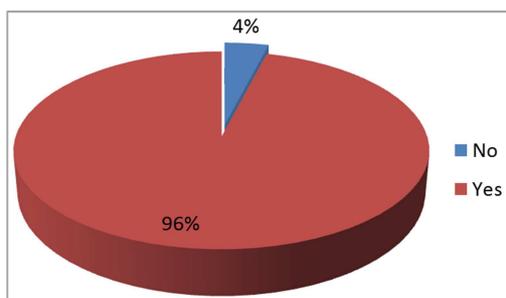
Characteristics		frequency	Percent (%)
Favourable opinion		154	68.1
Unfavourable opinion		72	31.9
EPI program is being free	Agree	117	51.8
	Disagree	99	43.8
	Don't know	10	4.4
Immunization is preventable disease	Agree	223	98.7
	Disagree	1	0.1
	Don't know	2	0.9
Vaccination side effects are dangerous	Agree	13	5.8
	Disagree	210	92.9
	Don't know	3	1.3
Vaccinators do experiment on infant	Agree	48	21.2
	Disagree	157	69.5
	Don't know	21	9.3
Vaccination makes infant sick	Agree	27	11.9
	Disagree	198	87.6
	Don't know	1	0.4
Positive attitude of mother toward immunization	Agree	178	78.8
	Disagree	47	20.8
	Don't know	1	0.4
Immunization is important for only none serious disease	Agree	10	4.4
	Disagree	172	76.1
	Don't know	44	19.5

**Table 4.** Practice of respondent mothers regarding immunization of infants in shashemene referral Hospital 2018.

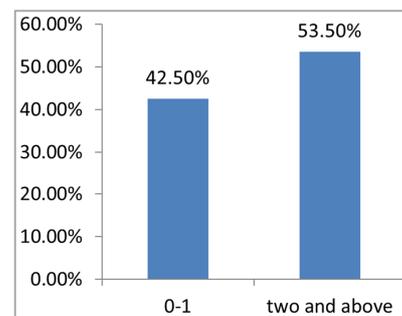
Characteristics		Frequency	Percent (%)
Adhering immunization schedule	Yes	216	95.6
	No	12	4.4
Confirming BCG scar of vaccination	Yes	189	83.6
	No	37	16.4
Availability of EPI card During immunization	Yes	222	98.2
	No	4	1.8
Infant immunization practices always by EPI card	Yes	226	100
	No	0	0

Majority of mothers 217 (96%) where taken TT Vaccination during pregnancy.

More than half of mothers 121 (53.5) where take above two TT vaccination.



**Figure 1.** Tetanus toxoid (TT) vaccination of mothers at shashemene referral Hospital, in 2018.



**Figure 2.** Number of TT vaccine had taken by mothers at shashemene referral Hospital in 2018.

**Table 5.** Factors associated with respondent mothers' Practice regarding immunization of infants in shashemene referral hospital 2018.

Variables	Practices No (%)		COR (95%CI)	AOR (95%CI)
	Poor practices	Good practices		
Mother education illiterates	21 (75)	7 (25)	1	1
Able to read and write	10 (76.9)	3 (23.1)	0.9 (0.191, 4.232)	0.878 (0.173, 4.457)
Grade 1-4	10 (83.3)	2 (16.7)	0.6 (0.105, 3.427)	0.665 (0.111, 4.022)
Grade 5-8	28 (49.1)	29 (50.9)	3.107 (1.142, 8.452)	3.179 (1.116, 9.056)
Grade 9-12	49 (59.8)	33 (50.2)	2.02 (0.772, 5.290)	2.44 (0.818, 6.134)
University/college	12 (35.3)	22 (64.7)	5.500 (1.817, 16.646)	8.837 (2.679, 29.150)
Deliver at home	37 (67.3)	18 (32.7)	1	1
Deliver at health institution	93 (54.4)	78 (45.6)	1.724 (1.285, 4.282)	2.592 (1.202, 5.588)
Age of infant				
0-10 weeks	53 (76.8)	16 (23.2)	1	1
11-14 weeks	45 (55.6)	36 (44.4)	2.650 (1.302, 5.392)	3.411 (1.509, 7.714)
15 weeks-1 years	32 (42.1)	44 (57.9)	4.555 (2.215, 9.367)	6.805 (2.875, 16.106)
Occupation of mother				
House wife and farmer	107 (61.1)	68 (38.9)	1	1
Merchant	14 (60.9)	9 (39.1)	1.012 (0.415, 2.465)	
Government employee	9 (32.1)	19 (67.9)	3.322 (1.421, 7.767)	

## 4. Discussion

Immunization is an important public health interventions strategy to reduce the morbidity and mortality associated with infectious diseases. Vaccine preventable diseases remain the most common cause of childhood mortality with an estimated two million deaths each year [1, 7]. Uptake of vaccination services is dependent not only on provision of these services but also on other factors including knowledge, attitude and factor affects practices of mothers vaccine utilization.

In this study, 223 (98.7%) of mothers have heard information about infant immunization, and 117 (51.8%) of them have accesses of information from health professionals. Similarly study done Saudi Arabia 2017 Most of them (58.1%) had their information regarding child vaccination from medical staff, followed by social media (17.4%) [1, 3].

In this study 153 (67.7) of mother had a positive attitude towards vaccination and 68.1% of them had friendly seen the health personnel. Despite the fact that respondents had positive attitude towards the EPI program and vaccine providers in general, a large proportion 31.9% of mothers believed that vaccines are given for infants to prevent non serious diseases [12]. This indicate that respondents have inadequate knowledge of related to vaccine preventable disease, indirectly affected their attitude.

Regarding immunization practice, those mothers who had infants with the age range of week, a 11-14 weeks three times 3.411 95% CI: (1.509, 7.714) and 9-12 month were six times 6.805 95% CI: (2.875, 16.106) significantly associated with mothers' immunization practices than those mothers who had infants 0-10 week old.

Similarly study done at Addis Ababa health center those mothers who had infants with the age range of 1-2 months, 2-3 months and 9- 12 months were four times significantly associated with mothers' immunization practices than those mothers who had infants aged 0-1 month old infants' immunization practice than their counter parts, respectively [19]. This show that where mothers' more contact with health personal for immunization services they got knowledge, and

more practice of child vaccination.

In this study 13.3% of respondents correctly mentioned the time when infants should begin BCG vaccination (just after birth) and study Addis Ababa show that 90% of infants should start BCG vaccination just after birth.

Literate respondents who attend elementary school were about three times [AOR=3.179 95%CI: (1.116, 9.056)] whereas mother there who achieved higher education nine times [AOR=8.837 95%CI: (2.679, 29.150)] had infants immunization practices than unable to read and write respondents. similarly institutional based study at Arbaminch revealed Children from educated mothers had better chance to be fully immunized than children from not educated mother AOR (95%CI 2.22 (1.31, 3.76) [20].

This revealed an association between higher paternal educational level and higher knowledge and attitude towards child immunization practices.

This paper has its own strength because it is based on primary data and can be used as base-line information for intervention programs and further investigation. It was institution based study and the number of mothers having unfavorable attitude could be decreased.

## 5. Conclusion

This study showed that 52.3%, 67.7%, 42.3% of study participant had good knowledge, attitude, and practice towards immunization of infants respectively. Educational interventions are required to improve parents' knowledge, attitude, and practice.

## Abbreviations

AU	Ambo University
DPT	Diphtheria, pertussis tetanus
EDHS	Ethiopian demographic health survey
EPI	Expanded program of immunization
Epi	Epidemiological information
HepB	Hepatitis B virus
HEW	Health extension workers

Hib	Homophiles influenza B type
KP	Knowledge, Practice
MDG	Millennium Development Goal
MDVP	Multi dose open policy
OPV	Oral polio vaccine
PCV	Pneumococcal vaccine
SPSS	Statistical package for the social science
TT	Tetanus toxoid
WHO	World Health Organization

## Declarations

### *Ethics Approval and Consent to Participate*

The research project was reviewed by an Institutional Review Board of Ambo University. Permission to conduct the research was obtained from the authorities in the study settings and written informed consents were secured from each participant. The age of participants were greater than or equal to 18 years old.

### *Consent for Publication*

Not applicable

### *Availability of Data and Materials*

Datasets used and /or analyzed during the current study

## Appendix

### *Questionnaire*

Questionnaire prepared to collect data for the assessment of knowledge, attitude and practice of mothers towards immunization, in shashemene referral Hospital west Arsi, zone Oromia Region, Ethiopia, 2018

Participant Identification Number: \_\_\_\_\_ Date: \_\_\_\_\_

Section A: Socio-demographic characteristic related questions

S. No.	Questions	Responses
101	What is your age?	_____
102	Mother's marital status?	Married Divorced Widowed unable to read and write able to read and write
103	Mothers educational status?	Grade 1-4 Grade 5-8 Grade 9-12 College/University
104	Religion	A. Orthodox Muslim Protestant Other, specify _____ House wife
105	What is occupation of the mother?	Merchant Farmer Government employee
106	Number of children ever born by the mother	_____
107	Number of children alive	_____
108	The age of your most recent child is	_____
109	What is your family monthly income per month?	_____
110	Ethnicity	Amhara Tigray
111	Place of birth _____	Oromo Other, specify _____

available from the corresponding author on reasonable request.

### *Competing Interests*

The authors declare that they have no competing interests.

### *Funding*

The study was funded by Ambo University. This funding source had role in the design of this study and have role during its execution, analyses, interpretation of the data.

### *Authors' Contributions*

YG, GE, EM, DT, EL, and EB were participated from the inception of the research idea to proposal development, data collection, analysis and preparation & revision of the manuscript for publication. The authors read and approved the final version of the manuscript.

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## Section B: Knowledge related questions

S. No.	Questions	Responses
201	Have you heard of expanded program of immunization? (If no go to question No 203).	Yes No Radio Television Friends/peers School Health personnel Other, specify _____
202	If yes for question no. 201 from where did you hear?	To prevent vaccine specific disease For treating childhood disease Don't know Other, specify _____
203	Do you mention the purpose of vaccinating a child?	Measles Pneumonia Tetanus Diarrhea Polio Pertussis Hepatitis Tuberculosis Diphtheria Homophilesinfluenza
204	How many vaccine preventable diseases do you know?	One Two Three Four Five Don't know Just at birth after one year
205	How many vaccination sessions are needed for a child to be fully protected?	Six weeks after birth I don't know Any time Before one year Greater or equal to one year I Don't know
206	Do you tell me the age at which the child begins immunization?	Yes No Don't know
207	At what age the child should complete immunization?	Yes No Don't know
208	Do you think vaccination will make your child sick?	Yes No Don't know
209	Do you bring a sick child for vaccination?	Yes No

## Section C: Attitude related questions

S No.	Questions	Responses
301	I think vaccine that costs too much	Agree Disagree Don't know
302	I am in need of protection against vaccine preventable infection?	Agree Disagree Don't know
303	Immunization is important for infants	Agree Disagree Don't know
304	Vaccination causes complication to infants?	Agree Disagree Don't know
305	Vaccination will not work / have no use?	Agree Disagree Don't know
306	Vaccination is against to my religion / cultures?	Agree Disagree Don't know
307	I advise other mothers to get their children immunized?	Agree Disagree

S No.	Questions	Responses
308	Do you think vaccinators do experiment on infants?	Don't know Agree Disagree Don't know
309	Vaccination side effects are dangerous?	Agree Disagree Don't know
310	Immunization is important only for non-serious disease?	Agree Disagree Don't know

## Section D: practice related questions

S No.	Questions	Responses
401	Does your child take any vaccination?	Yes No
402	Do you have a card where vaccinations are written down?	Yes No
403	Does all your child completed vaccination?	Yes No
404	Do you Confirming BCG vaccination By looking the presence of BCG scar	Yes I don't know
405	Do you Adhere to immunization schedule	Yes No
406	Does the child taking vaccination at correct schedule?	Yes No
407	Infant immunization practice always by EPI card?	Yes No
408	Have you had Tetanus Toxoid (TT) vaccination during pregnancy?	Yes No
409	If yes for question number 409 how many doses have you taken?	Once Twice More than twice

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