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

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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

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 one of the main health problems facing children in under-five age group and from 67 deaths per 1,000 live births majority of those death due to vaccine preventable disease in Ethiopia [11].

To fill those gaps, this study was assess the knowledge, attitude, and practices of mothers 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 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.

\[
\frac{(z \alpha/2)^2 \times p(1-p)}{d^2} = \frac{[1.96]^2 \times [0.55] \times [0.45]}{0.05^2}
\]

\[=380/(1+n_0/N)\]

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

\[n_0 = \frac{n}{1+(n_0/N)}\]

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        |
| grade 9-12                       | 82        | 36.3        |
| Muslim                           | 123       | 54.4        |
| **Religions**                    |           |             |
| Orthodox                         | 51        | 22.6        |
| Protestant                       | 47        | 20.8        |
| Others                           | 5         | 2.2         |
| Married                          | 223       | 98.7        |
| **Marital status of mothers**    |           |             |
| Divorced                         | 2         | 0.9         |
| Widowed                          | 1         | 0.4         |
| **Occupation of mothers**        |           |             |
| House wife                       | 175       | 77.4        |
| Merchants                        | 23        | 10.2        |
| Gov employed                     | 28        | 12.4        |
| <500                             | 9         | 4           |
| 500-1000                         | 55        | 24.5        |
| 1000-5000                        | 128       | 85          |
| >5000                            | 34        | 15          |
| **House monthly income ETB**     |           |             |
| Oromo                            | 193       | 85.4        |
| Amhara                           | 23        | 10.2        |
| Tigray                           | 2         | 0.9         |
| Others                           | 8         | 3.5         |
| **Ethnicity**                    |           |             |
| Place of birth infants           |           |             |
| At home                          | 122       | 54          |
| At health institution            | 104       | 46          |
| 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                  | 223       | 98.7        |
| No                                                   | 43        | 19.0        |
| Health profession                                    | 117       | 51.8        |
| TV and Radio                                         | 74        | 32.7        |
| School friend                                        | 22        | 9.37        |
| From all                                             | 11        | 4.9         |
| Just after birth                                     | 30        | 13.3        |
| After six week                                       | 181       | 80.1        |
| After two month                                      | 10        | 4.4         |
| I don’t know                                         | 5         | 2.2         |
| Three                                                | 15        | 6.6         |
| Four                                                 | 161       | 71.2        |
| Five                                                 | 30        | 13.3        |
| Six                                                  | 3         | 1.3         |
| Before one year                                      | 191       | 34.5        |
| After one year                                       | 30        | 13.3        |
| I don’t know                                         | 5         | 2.2         |

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 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        |
| Don’t know                                           | 2         | 0.9         |
| Disagree                                             | 1         | 0.1         |
| Vaccination side effects are dangerous               |           |             |
| Agree                                                | 13        | 5.8         |
| Don’t know                                           | 210       | 92.9        |
| Disagree                                             | 3         | 1.3         |
| Vaccinators do experiment on infant                  |           |             |
| Agree                                                | 48        | 21.2        |
| Don’t know                                           | 157       | 69.5        |
| Disagree                                             | 3         | 1.3         |
| Immunization make infant sick                        |           |             |
| Agree                                                | 178       | 78.8        |
| Don’t know                                           | 47        | 20.8        |
| Disagree                                             | 1         | 0.4         |
| Positive attitude of mother toward immunization      |           |             |
| Agree                                                | 10        | 4.4         |
| Don’t know                                           | 172       | 76.1        |
| Disagree                                             | 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.
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 3.322 (1.421, 7.767) 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

| Abbreviation | Description |
|--------------|-------------|
| 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 |
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 are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

Funding

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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. The authors read and approved the final version of the manuscript.

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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?                                   | Married                                                                                       |
|        |                                                    | Divorced                                                                                      |
|        |                                                    | Widowed                                                                                       |
|        |                                                    | unable to read and write                                                                      |
|        |                                                    | able to read and write                                                                        |
|        |                                                    | Grade 1-4                                                                                     |
|        |                                                    | Grade 5-8                                                                                     |
|        |                                                    | Grade 9-12                                                                                    |
|        |                                                    | College/University                                                                            |
|        |                                                    | A. Orthodox                                                                                   |
|        |                                                    | Muslim                                                                                       |
|        |                                                    | Protestant                                                                                    |
|        |                                                    | Other, specify                                                                                |
| 105    | What is occupation of the mother?                   | House wife                                                                                    |
|        |                                                    | 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                   |                                                                                               |
| 109    | What is your family monthly income per month?       |                                                                                               |
| 110    | Ethnicity                                           |                                                                                               |
| 111    | Place of birth                                     |                                                                                               |
### Section B: Knowledge related questions

| S. No. | Questions                                                                 | Responses                                      |
|--------|---------------------------------------------------------------------------|------------------------------------------------|
| 201    | Have you heard of expanded program of immunization? (If no go to question  | Yes                                            |
|        | No 203).                                                                  | No                                             |
|        |                                                                           | Radio                                          |
|        |                                                                           | Television                                    |
|        |                                                                           | Friends/peers                                  |
|        |                                                                           | School                                         |
|        |                                                                           | Health personnel                               |
| 202    | If yes for question no. 201 from where did you hear?                      | To prevent vaccine specific disease            |
|        |                                                                           | For treating childhood disease                 |
|        |                                                                           | Don’t know                                     |
| 203    | Do you mention the purpose of vaccinating a child?                        | Other, specify                                  |
|        |                                                                           | Measles                                        |
|        |                                                                           | Pneumonia                                      |
|        |                                                                           | Tetanus                                        |
|        |                                                                           | Diarrhea                                       |
|        |                                                                           | Polio                                          |
| 204    | How many vaccine preventable diseases do you know?                        | Pertussis                                      |
|        |                                                                           | Hepatitis                                      |
|        |                                                                           | Tuberculosis                                   |
|        |                                                                           | Diphtheria                                     |
|        |                                                                           | Homophilesinfluenza                            |
| 205    | How many vaccination sessions are needed for a child to be fully protected? | One                                            |
|        |                                                                           | Two                                            |
|        |                                                                           | Three                                          |
|        |                                                                           | Four                                           |
|        |                                                                           | Five                                           |
|        |                                                                           | Don’t know                                     |
|        |                                                                           | Just at birth                                  |
|        |                                                                           | after one year                                 |
| 206    | Do you tell me the age at which the child begins immunization?            | Six weeks after birth                          |
|        |                                                                           | I don’t know                                   |
|        |                                                                           | Any time                                       |
| 207    | At what age the child should complete immunization?                       | Before one year                                |
|        |                                                                           | Greater or equal to one year                   |
|        |                                                                           | I Don’t know                                   |
| 208    | Do you think vaccination will make your child sick?                       | Yes                                            |
|        |                                                                           | No                                             |
| 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  |
| 302   | I am in need of protection against vaccine preventable | Agree     |
|       | infection?                                            | 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  |
Section D: practice related questions

| S No. | Questions                                           | Responses            |
|-------|-----------------------------------------------------|----------------------|
| 401   | Does your child take any vaccination?               | Yes                  |
| 402   | Do you have a card where vaccinations are written down? | Yes                  |
| 403   | Does all your child completed vaccination?          | Yes                  |
| 404   | Do you Confirming BCG vaccination By looking the presence of BCG scar | Yes                  |
| 405   | Do you Adhere to immunization schedule             | Yes                  |
| 406   | Does the child taking vaccination at correct schedule? | Yes                  |
| 407   | Infant immunization practice always by EPI card?   | Yes                  |
| 408   | Have you had Tetanus Toxoid (TT) vaccination during pregnancy? | Yes                  |
| 409   | If yes for question number 409 how many doses have you taken? | Twice More than twice |

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