



## Client Satisfaction towards Expanded Program on Immunization Service and Associated Factors in Doyogena Woreda, Southern Ethiopia

Terefe Lafore<sup>1</sup>, Bekafe Kibamo<sup>2</sup>, Kebebus Ergicho<sup>1,2</sup>, Elias Ezo<sup>3\*</sup>

<sup>1</sup>Doyogena Woreda Health Office, Durame, Ethiopia

<sup>2</sup>Doyogena Woreda Health Office, Durame, Ethiopia

<sup>1,2</sup>Betezata Medium Clinic, Hosanna, Ethiopia

<sup>3</sup>Department of Comprehensive Nursing, College of Medicine, and Health sciences, Wachemo University, Hosanna, Ethiopia

**ABSTRACT: Background:** A client’s satisfaction with expanded program immunization services has good effects on her health and ensures the utilization of services. In developing countries, approximately 8 million children die before they reach their fifth birth day. When compared with a child in Western Europe, an Ethiopian child is 30 times more likely to die by his or her fifth-year birth. **Objective:** To assess client satisfaction with expanded programs on immunization services and associated factors in Doyogena Woreda, southern Ethiopia, 2021. **Methods:** A facility-based cross-sectional study design was employed from April 12 to May 31/2021. The total sample size was 402. A simple random sampling technique was used to select health facilities, and a systematic random sampling technique was used to select clients. The data were entered by using Epi data Version 3.1 and analyzed by SPSS version 24 software. Frequency, tables and figures were used. Multi colinearity was checked and the goodness of fit test was done using Hosmer-Lemeshow model goodness fit test. Bivariable analysis was done and variables with p value less than 0.025 were entered to multivariable logistic regression analysis. Statistical significance was declared at p value less than 0.05 with 95% confidence interval. **Result:** The magnitude of clients’ satisfaction with expanded programs on immunization services was 47.2% [95% CI: 42.0-52.2]. Clients in the age group of 20-24 were 3.2 times more satisfied with expanded programs on immunization services than clients in age groups greater than 35 years [AOR: 3.20, 95%CI: 1.11, 9.27], clients travelling less than thirty minutes to reach the health facility were 9.4 times more satisfied with expanded programs on immunization services than clients who travelled more than thirty minutes [AOR: 9.42, 95%CI: 4.79, 18.53] and clients who were informed on the dose of the vaccination were 2.3 times more satisfied with expanded programs on immunization services than clients who were not informed on the dose of the vaccination [AOR: 2.32, 95%CI: 1.29, 4.17]. **Conclusion:** Nearly half of the clients were satisfied towards an expanded immunization service program. More efforts are needed to improve services with respect to health workers’ relationships, communication, waiting time for immunization and provision of health information to enhance satisfaction among clients towards expanded programs on immunization services.

**Keywords:** Client satisfaction, Childhood immunization, Doyogena Woreda.

**Copyright © 2021 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

### RESEARCH PAPER

**\*Corresponding Author:**  
 Elias Ezo  
 Department of  
 Comprehensive Nursing,  
 College of Medicine, and  
 Health sciences, Wachemo  
 University, Hosanna,  
 Ethiopia

**How to cite this paper:**  
 Terefe Lafore *et al.*; “Client Satisfaction towards Expanded Program on Immunization Service and Associated Factors in Doyogena Woreda, Southern Ethiopia, 2022; A Prospective Cohort Study Protocol”. Middle East Res J Nursing, 2021 Nov-Dec 1(1): 21-30.

### Article History:

| Submit: 17.10.2021 |  
 | Accepted: 27.11.2021 |  
 | Published: 27.12.2021 |

## INTRODUCTION

A client’s satisfaction with the expanded program immunization service has good effects on her health and ensures the utilization of services [1-4]. In 2019, almost 5.3 million children died globally, and over half of the deaths occurred before the age of five due to vaccine and vaccine preventable disease [5]. In developing countries, approximately 8 million children die before they reach their fifth birth day [2, 3, 6-9].

Compared with a child in Western Europe, an Ethiopian child is 30 times more likely to die by his or her fifth year birth [10-12]. In Nigeria, 49% clients were very satisfied with the response by the health care providers; concerning the attitude of staff, 37.8% clients were satisfied, while 49% satisfied clients were with the waiting time [13]. The study was performed in Jigjiga Zone, Ethiopia; 53.3% of clients were satisfied with the service provided [14]. In Kombolcha town, Ethiopia,

61.1% of caretakers were satisfied with childhood immunization services [15].

Client satisfaction is one of the most commonly used outcome measures for care, and it should be addressed to improve the value and efficiency of health care service provision within the health care delivery system. It affords valuable feedback on how the service is operating according to clients' views and what changes might be needed to meet clients' anticipation. Studies have reported that client satisfaction plays a key role in improving immunization services and eventually will increase their coverage.

A study revealed that client satisfaction plays a key role in improving the EPI service and ultimately will enhance its coverage [12, 13, 16, 17]. In the United Nations report, child mortality rates are a key indicator of a country's socioeconomic status and satisfaction of life [18]. According to the World Health Organization report of 2019, approximately 85% of children worldwide have received three doses of diphtheria-tetanus-pertussis vaccine, protecting them against infectious diseases that may cause illness and disability [19].

Although efforts have been made thus far, low-income countries continue to meet a substantial burden of Vaccine Preventable Diseases, and their immunization coverage is low compared to middle- and high-income countries [20]. Among all children who were not immunized or not fully immunized, 11.7 million lived in ten low-income countries, one of which was Ethiopia. The Ethiopian government has made some changes, such as ensuring a continuous supply of vaccines, providing health education on childhood immunization, and improving the service process system to increase client satisfaction, which may increase immunization levels [21]. However, the level of client satisfaction with child immunization remains low. Moreover, there is no information about client satisfaction with EPI services in the study area.

## METHODS AND MATERIALS

### Study area and period

Doyogena woreda is found in the Kembata Tembaro Zone of Southern Nations Nationalities and the People's Regional State of Ethiopia. The Woreda is located 67 km away from Durame, the capital of Kembata Tembaro zone, 171 km away from Hawassa, the capital of Southern Nations Nationalities and the Peoples Regional State and 258 km away to south of Addis Ababa, the capital of Ethiopia. The Woreda has a primary hospital, three health centers, eight health posts, seven private clinics, and eight drug stores. The health facilities found in the woreda provide preventive,

curative, and rehabilitative health care services for the needs of the population coming from Doyogena and other nearby woredas. The study was conducted from April 12 to May 31/2021.

### Study design

An institution based cross sectional study was employed.

### Source Populations

All clients who come to the EPI clinic with children aged less than 2 years and receive immunization services in the health facility of Doyogena woreda.

### Study Population

Selected clients with children aged less than two years visiting the selected health facilities before the study period.

### Inclusion Criteria

Clients with children aged less than two years visited who had at least one vaccine in the selected health facilities during the study period.

### Exclusion Criteria

Clients who are unable to hear or cannot respond during data collection.

### Sample Size Determination

The sample size was calculated based on a single population proportion formula with the assumption of a 5% margin of error ( $d$ ), 95% confidence level ( $Z$ ), and client satisfaction assumed to be 61.1%, which was conducted in Kombolcha town, south Wollo Zone [15].

Where  $p$  is the proportion of client satisfaction  
 $d$  is margin of error = 0.05.

$Z_{\alpha/2}$  is confidence level required and  $Z_{\alpha/2}$  at 95% CI= 1.96

$n$  is the minimum sample size

Using the above assumptions, the sample size was calculated as follows.

$$n = \frac{(Z_{\alpha/2})^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.611(1-0.611)}{(0.05)^2} = 365$$

By considering a nonresponse rate of 10%, the sample size was 402

### Sampling procedure

There was one primary hospital, three health centers and eight health posts in Doyogena Woreda. The primary hospital, all health centers and all health posts were included in the study. Then, proportional allocation was used to determine the required number from the total number of children less than two years in each institution. Finally systematic random sampling

technique was used to identify the clients with constant value of seven which is gained from dividing the total number of children to the total sample size. The first participant was identified randomly and the data

### Study Variables

#### Dependent Variable

Client satisfaction towards EPI service

#### Independent Variables

Sociodemographic characteristics of the client: age, sex, educational status, family income, marital status, religion, residence, occupation, relationship of child

#### Characteristics of the child

Age, sex and birth order index

Process-related factors: greeting before giving service in the vaccination room, given information about the current vaccine type of vaccine child taken, telling the next immunization schedule.

Access-related factors: type of health facility, time taken to reach this health facility on foot, transportation to the health facility, and length of time for service.

Knowledge of Clients on vaccine: EPI targets diseases, vaccination protects a child from infectious disease, infants should start vaccination just after birth, vaccinating breastfeeding child, side effects of EPI vaccines.

#### Operational Definitions

Health facility: an institution in which different types of care management, including EPI services, are given. It included primary hospitals, health centers and health posts.

Clients' satisfaction on EPI: Clients' satisfaction towards childhood immunization was measured using 10 satisfaction related items categorized into health workers Relationships, and communication 4 items), physical Environment (4 items), and Immunization system (2 items) Each tool used to measure satisfaction is rated in a five point Likert scale response (i.e., 1, very dissatisfied 2, dissatisfied 3, neutral 4, satisfied and 5, very satisfied). First, the overall clients' satisfaction level was computed by adding the mean score of 10 satisfaction measures. Finally, overall satisfaction was dichotomized as satisfied if scored mean and above scored (20.72) and not satisfied if scored below mean [22].

Clients' knowledge about EPI: clients' knowledge about childhood immunization was

collected based on the constant value. The diagrammatic presentation of the sampling procedure is shown below (Figure 1).

measured using five [5] questions related to child hood immunization. Each correct answer was given an assignment of one [1], and a zero [0] point was given to the incorrect answers. Respondents who scored a mean (6.27) and above were considered to have good knowledge, and those who scored below were considered to have poor knowledge about childhood immunization [23].

#### Data collection tool and data collection procedure

The data were collected using a pretested structured questionnaire. The tool was adapted by reviewing the literature related to satisfaction with EPI services. Clients with children who come to the EPI services were interviewed at the exit by using the structured questionnaire. Clients were asked to show immunization cards before the interview to identify whether they were previously vaccinated.

#### Data Quality Control

The tools were prepared in English, translated to Amharic (official language of Ethiopia), translated to Kembtesa (local language) and then retranslated to English by people who are capable in both languages to maintain the consistency of the tools. Before the actual data collection, the 5% (20 clients) tool was pretested at Angacha Health Center to test the clarity of the questions and to check the consistency, flow, missing data, and skip patterns of the tool in other health institutions found in Doyogena woreda. Four diploma nurses and two public health officers were recruited for data collection and supervision, respectively. One day of training was given for the data collectors and supervisors regarding the objectives, rationale of the study, informed consent, and interview techniques. All filled data were reviewed each day, and issues arising during the data collection were addressed by discussion with the supervisors and data collectors.

#### Data processing and data analysis

The collected data were checked and coded before they were fed to the computer database. The data were entered by using Epi data version 3.1 and analyzed by using SPSS version 24 software. Data were computed and recoded. Descriptive statistics such as proportions, percentages, frequency distribution and measures of central tendency (median) were performed. Multicollinearity was checked using the Hosmer-Lemeshow model goodness fit test. Independent variables with p values less than 0.025 in bivariate analysis were considered candidates for multivariate analysis. Variables with a p value less than 0.05 in

multivariate analysis were considered a significant determinant of client satisfaction.

## RESULT

### Sociodemographic Characteristics of Clients

Four hundred clients gave responses that made the overall response rate 99.5%. The median and inter quarter range age of clients was 28.00 (24.00 – 33.00) years. Most of the clients, 119(29.8%), were 25-29 years old. The majority 341(85.2%) were married, and 223(80.8%) of the children were taken by mothers. Approximately 269(67.2%) were attended formal education. More than half, 303(75.8%) were housewives, and 303(75.8%) were follower of Protestant religion (Table 1).

### Infant Characteristics

More than half (220, 55%) of the infants were females, and 180 (45%) were males. The majority (266, 66.5%) were in the age category of 2-6 months, and 134 (33.5%) were in the age category of 7-11 months. The birth order index of 336 (84%) was less than or equal to four, and 64 (16%) was greater than four.

### Knowledge of clients about EPI

Of the four hundred clients, approximately 283 (70.8%) had good knowledge, and 117 (29.2%) of the clients had poor knowledge about EPI service.

### Access related factors

For more than half of the mothers, 235 (58.8%) mothers took 30 minutes or less to reach a health facility on foot, and for 347 (86.8%) mothers, vaccination was completed in fifteen minutes. The majority of mothers (310, 77.5%) came to health institution on foot (Table 2).

### Process-related factors

The majority (347, 86.8%) of the clients were happy when a child was vaccinated, and approximately 330 (82.5%) of the clients were greeted by the health team before giving service. More than half (289, 72.2%) of the clients received information about the current vaccine, 181 (62.6%) of the clients were told the dose of the vaccine a child took, and 327 (81.8%) of the clients were told the next immunization schedule. Only 99 (24.8%)

of the client children experienced problems after vaccination (Table 3).

### Physical environment

More than half, 256 (64%) of the clients were satisfied with the cleanness and comfort of the waiting place, and 251 (62.8%) of the clients were satisfied with the sanitation and hygiene of the vaccination room. More than half, 229 (57.2%) clients were satisfied with the availability of drinking water in the vaccination building, and approximately 305 (76.2%) clients were satisfied with the availability of latrine (Table 4).

### Immunization system

More than two-thirds, 274 (68.5%) clients were satisfied, 79 (19.8%) clients were very satisfied, 38 (9.5%) clients were dissatisfied and 9 (2.2%) clients were neutral regarding the availability of vaccines at the health facility. Approximately 296 (74%) clients were satisfied, 69 (17.2%) clients were very satisfied, 18 (4.5%) clients were dissatisfied and 17 (4.3%) clients were neutral about the convenience of the schedule day (Table 5).

### Client satisfaction for specific health facilities

Regarding the satisfaction of each health facility, 34(18.0%) of clients were in Doyogena primary hospital, 67(35.4%) of clients were satisfied in health centers and 88(46.6) of clients were satisfied in health posts (Table 6).

### Clients` satisfaction on EPI

(Figure 2)

### Factors associated with clients` satisfaction on EPI

In bivariate analysis, age, time taken to reach health facility, informed on type of vaccine and information on dose of vaccine were candidates for multivariate analysis. In multivariate analysis, age group 20 – 24 [AOR: 3.20, 95%CI: 1.11, 9.27], time taken to reach health facility (less than thirty minutes) [AOR: 9.42, 95%CI: 4.79, 18.53] and informed on dose of vaccine [AOR: 2.32, 95%CI: 1.29, 4.17] were associated increased odds of client satisfaction (Table 7).

### Tables

The following are tables indicated in the text.

**Table-1: Sociodemographic characteristics of clients, Doyogena Woreda, Southern Ethiopia, 2021**

Variable (n=400)	Category	Frequency	Percent
Age of clients	15-19	24	6.0
	20-24	80	20.0
	25-29	119	29.8
	30-34	104	26.0
	≥ 35	73	18.2
Sex of clients	Male	59	14.8
	Female	341	85.2
Marital status of clients	Married	341	85.2
	Single	30	7.5
	Divorced	19	4.8
	Widowed	10	2.5
Relationship of the clients to child	Mother	323	80.8
	Father	56	14.0
	Guardian	19	4.8
	Other	2	0.5
Education status of the clients	Attended formal education	269	67.2
	Not attended formal education	131	32.8
Grade level of formally attended clients (n=269)	Grade 1-8	133	49.5
	Grade 9-12	102	37.9
	>12	34	12.6
Occupation of the clients	Gov't Employee	51	12.8
	Private employee	24	6.0
	Merchant	22	5.5
	Housewife	303	75.8
Residence of clients	Urban	263	65.8
	Rural	137	34.2
Religion of clients	Protestant	303	75.8
	Orthodox	32	8.0
	Catholic	32	8.0
	Muslim	21	5.2
	Others	12	3.0
Monthly income of clients	<1500	55	13.6
	1600-2500	139	34.8
	2600-3500	103	25.8
	> 3500	103	25.8

**Table-2: Assess related factors of Mothers satisfaction on the EPI service, Doyogena, Kembata Tembaro Zone, Ethiopia, 2021.**

Variable (n= 400)	Category	Frequency	Percent
Health facility	Doyogena primary hospital	62	15.5
	Amacho health center	57	14.3
	Wassera health center	53	13.3
	Serera health center	47	11.8
	01 health post	33	8.3
	02 health post	30	7.5
	Wagawata health post	17	4.3
	Bokata health post	26	6.5
	Sutico health post	18	4.5
	Bakafa health post	38	9.5
	Utuge health post	11	2.8
	Murasa health post	8	2.0
Time it takes to reach health facility on foot (in minute)	< 30 minute	235	58.8
	>30 minute	165	41.2
Time spent while getting vaccination (in minute)	< 15 minute	347	86.8
	>15 minute	53	13.2
Means of transportation	Bajaj	30	7.5
	Taxi	41	10.2
	Motore cycle	19	4.8
	On foot	310	77.5



**Table-3: Process related factors of Mothers satisfaction on the EPI service, Doyogena, Kembata Tembaro Zone, Ethiopia, 2021.**

Variable	Category	Frequency	Percent
Happy when a child got vaccinated	Yes	347	86.8
	No	53	13.3
Health team greeted before giving the service in vaccination	Yes	330	82.5
	No	70	17.5
Given information about the current vaccine	Yes	289	72.2
	No	111	27.8
Health care worker told the type of vaccine a child taken	Yes	222	76.8
	No	67	23.2
Health care worker told the dose of the vaccine a child taken	Yes	181	62.2
	No	108	37.4
Health care worker told the next immunization schedule	Yes	327	81.8
	No	73	18.2
Child got problems after vaccinated	Yes	99	24.8
	No	301	75.2

**Table-4: Physical environments of clients, Doyogena Woreda, Southern Ethiopia, 2021.**

Variable (n=400)	Category	Frequency	Percent
Waiting place is clean and comfortable	Very satisfactory	69	17.3
	Satisfactory	256	64.0
	Neutral	47	11.8
	Disatisfactory	78	7.0
Sanitation and hygiene of vaccination room	Very satisfactory	70	17.5
	Satisfactory	251	62.8
	Neutral	41	10.2
	Disatisfactory	38	9.5
Water supply in the vaccination building	Very satisfactory	63	15.8
	Satisfactory	229	57.2
	Neutral	29	7.2
	Disatisfactory	69	17.3
	Very disatisfactory	10	2.5
Availablity and cleanness of latrine	Very satisfactory	38	9.5
	Satisfactory	305	76.2
	Neutral	40	10
	Disatisfactory	17	4.3

**Table-5: Immunization system of clients, Doyogena Woreda, Southern Ethiopia, 2021.**

Variable (n=400)	Category	Frequency	Percent
Availability of vaccine at this health facility in the scheduled day	Very satisfactory	79	19.8
	Satisfactory	274	68.5
	Neutral	9	2.2
	Disatisfactory	38	9.5
Convenience of schedule day for you	Very satisfactory	69	17.2
	Satisfactory	296	74
	Neutral	17	4.3
	Disatisfactory	18	4.5

**Table-6: Client satisfaction for specific health facilities, Doyogena Woreda, Southern Ethiopia, 2021**

Health facility	Not satisfied		Satisfied	
	Frequency	Percent	Frequency	Percent
Doyogena primary hospital	28	13.3	34	18.0
Health centers	90	42.6	67	35.4
Health posts	93	44.1	88	46.6

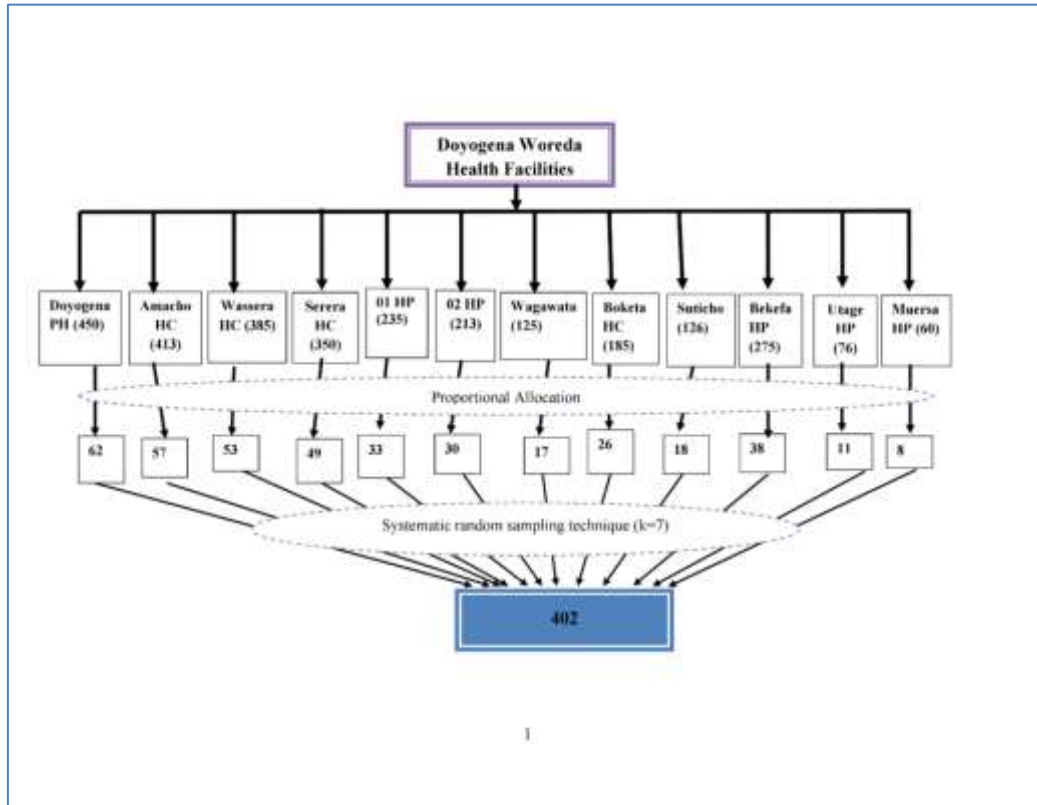
**Table-7: Factors associated with clients' satisfaction with the EPI service, Doyogena Woreda, Southern Ethiopia, 2021.**

Variables (n=400)	Category	Client Satisfaction on EPI		COR (95% CI)	AOR(95% CI)	P-value
		Not Satisfied	Satisfied			
Age category	15-19	12(3%)	12(3%)	1.61(0.64,4.07)	10.35(0.93,115.74)	0.06
	20-24	34(8.5%)	46(11.5%)	2.17(1.14,4.15)	3.20(1.11,9.27)	0.03*
	25-29	67(16.8%)	52(13%)	1.25(0.69,2.26)	0.55(0.25,1.21)	0.14
	30-34	53(13.2%)	51(12.8%)	1.55(0.84,2.84)	1.33(0.59,2.96)	0.49
	> 35	45(11.3%)	28(7%)	1	1	
Time taken to reach	<30 minute	91(22.8%)	144(36%)	4.22(2.74,6.45)	9.42(4.79,18.53)	0.00*
	>30 minute	120(30%)	45(11.2%)	1	1	
Informed on type of vaccine	Yes	134(46.4%)	88(30.4%)	2.73(1.55,4.81)	1.75(0.81,3.75)	0.15
	No	24(8.3%)	43(14.9%)	1	1	
Informed on dose of vaccine	Yes	119(41.2%)	62(21.5%)	3.39(2.06,5.59)	2.32(1.29, 4.17)	0.01*
	No	39(13.5%)	69(23.9%)	1	1	

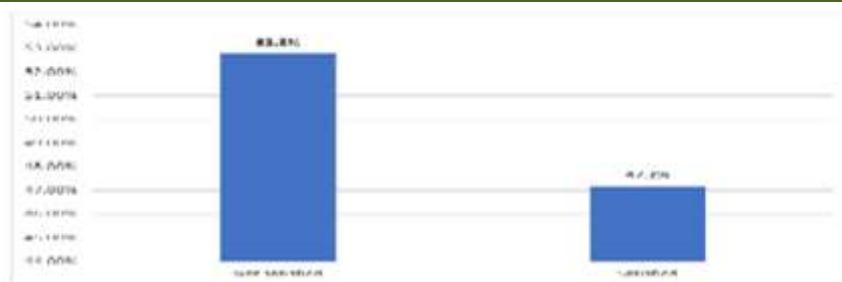
**Abbreviations:** EPI: expanded immunization program; COR: crude odds ratio; AOR: adjusted odds ratio  
 NB: “\*”  $p < 0.05$ : statistically associated; “1” = reference group

**Figures**

The following are figures indicated in the text, which are prepared in tiff image format with resolution of 300. So, it is possible to minimize or maximize the size as necessary.



**Fig-1: Diagrammatic presentation of the sampling procedure for clients' satisfaction with the EPI service, Doyogena woreda, Southern Ethiopia, 2021.**



**Fig-2: Clients' satisfaction with the EPI service, Doyogena woreda, Southern Ethiopia, 2021.**

## DISCUSSION

This study was conducted to assess clients' satisfaction with expanded programs of immunization services and associated factors in Doyogena woreda. The findings revealed that the overall magnitude of clients' satisfaction with expanded immunization services programs was 47.2% [95% CI: 42.0-52.2], which is in line with an institution based cross-sectional study conducted in Iraq (50.2%) [24]. However, it was lower than an institution based cross-sectional study performed in Jigijiga Zone, Somali Region 53.3% [17] and facility-based cross-sectional study in Kombolcha town, South Wollo Zone of Amhara National Regional State, Ethiopia in which 61.1% of caretakers were satisfied with childhood immunization service [15]. It was also lower than a community-based cross-sectional study conducted among 682 mothers in Wadla district, North Wollo Ethiopia, which showed maternal satisfaction with childhood immunization services to be 68.2% [25]. The difference might be related to kindly respectful care of the health care providers and the establishment of the health care facility for EPI service.

Regarding the factors associated with clients' satisfaction with EPI services, clients in the age group of 20-24 were 3.2 times more satisfied with EPI services than clients in the age group greater than 35 years. This may be related to clients within that age group being near for information and being active age groups. Clients for whom the time taken to reach the health facility was less than thirty minutes were 9.4 times more satisfied with EPI services than clients who went for more than thirty minutes to reach the health facility to vaccinate their infants. This may be related to traveling distance with infants making discomfort.

Clients who were informed of the dose of the vaccination were 2.3 times more satisfied with EPI services than clients who were not informed of the dose of the vaccination. This was similar to a study that stated that information provision about the dose of current vaccine was a significant predictor of client satisfaction with an expanded immunization service program in which mothers who received information on the dose of current vaccination were 2.24 times more

satisfied than mothers who did not receive information on the dose of the current vaccination with the information given by health care workers about vaccines and benefits of vaccinations. Additionally, this was supported by a study finding in Kombolcha of Ethiopia that determined that having prior information about the dose of the vaccine was significantly associated with maternal satisfaction with expanded program immunization services [15].

### Strength and Limitations of the study

The inclusion of study participants from hospitals, health centers and health posts could be a strength. It cannot determine cause and effect relationship since it was a cross sectional type could be mentioned as a potential limitation of the study.

## CONCLUSION AND RECOMMENDATION

### Conclusion

Generally, this study showed that less than half of the clients were satisfied towards expanded immunization service programs. Clients in the age group of 20-24 years, clients for whom the time taken to reach the health facility was less than thirty minutes to reach the health services to vaccinate their infants and clients who were informed on the dose of the vaccination were more satisfied with the expanded program immunization service.

### Recommendation

To improve client satisfaction in the study area, health care workers should do the following:

- Inform the dose of vaccine for the clients.
- Health care providers should plan many regular outreach sites near the community.
- Provide health information for clients towards expanded program immunization services.

### Authors' contribution

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all areas; took part in drafting, revising and critically reviewing the article; gave final approval of the version to be published; have agreed on



the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

### List of abbreviations used

AOR: Adjusted Odds Ratio; CI: Confidence Interval; COR: Crude Odds Ratio; EPI: Expanded program of immunization; SPSS: Statically Package of Social Science; WHO: World Health Organization.

## ACKNOWLEDGEMENT

We would like to thank the supervisors for their critical supervision, data collectors for collecting accurate data, and study participants for their willingness to participate, kindly provision of necessary information, and scarification of their valuable time spent during interviews.

### Competing of interests

All authors declare that they have no conflicts of interest.

### Ethical clearance

Ethical approval and clearance letters were obtained from Wachemo University, ethical review committee. A permission letter was also secured from a health facility located in Doyogena Woreda. Written informed consent was obtained from each participant, and the information obtained from them would not have been disclosed. Coding was used to eliminate names and other personal identification of respondents to ensure anonymity, privacy, and confidentiality. Thoroughly, our research passed required the principles of declaration of Helsinki General Assembly, Seoul, Korea, and October 2008.

### Funding

The authors did not receive specified funding for this study.

### Availability of data

The data are available upon secure and reasonable request.

## REFERENCE

1. Udonwa, N. E., Gyuse, A. N., Etokidem, A. J., & Ogaji, D. S. T. (2010). Client views, perception and satisfaction with immunisation services at Primary Health Care Facilities in Calabar, South-South Nigeria. *Asian Pacific Journal of Tropical Medicine*, 3(4), 298-301.
2. African Ro, WHO. (2012). Expanded Program on Immunization, World Health Organization.
3. Animaw, W., Taye, W., Merdekios, B., Tilahun, M., & Ayele, G. (2014). Expanded program of immunization coverage and associated factors among children age 12–23 months in Arba Minch town and Zuria District, Southern Ethiopia, 2013. *BMC public health*, 14(1), 1-10.
4. Ebrahim, Y., & Salgado, W. B. (2015). Childhood immunization coverage in Tehulederie district, Northeast of Ethiopia: A community based cross sectional study. *Int J Curr Res*, 7(9), 20234-40.
5. Smith, L. E., Amlôt, R., Weinman, J., Yiend, J., & Rubin, G. J. (2017). A systematic review of factors affecting vaccine uptake in young children. *Vaccine*, 35(45), 6059-6069.
6. Tadesse, B. H., Bayou, N. B., & Nebeb, G. T. (2017). Mothers' satisfaction with institutional delivery service in public health facilities of Omo Nada District, Jimma Zone. *Clinical Medicine Research*, 6(1), 23-30.
7. EFMOH. (2015). Ethiopia National Expanded Program on Immunization Comprehensive Multi Year Plan 2016-2020, Federal Ministry of Health, Addis Ababa.
8. Hosseinpoor, A. R., Bergen, N., Schlottheuber, A., Gacic-Dobo, M., Hansen, P. M., Senouci, K., ... & Barros, A. J. (2016). State of inequality in diphtheria-tetanus-pertussis immunisation coverage in low-income and middle-income countries: a multicountry study of household health surveys. *The Lancet Global Health*, 4(9), e617-e626.
9. Panth, A., & Kafle, P. (2018). Maternal satisfaction on delivery service among postnatal mothers in a government hospital, Mid-Western Nepal. *Obstetrics and gynecology international*, 2018.
10. UNICEF. (2005). Millennium Development Goal report, UNICEF, 2005, August 2013, [https://www.unicef.org/media/media\\_24321.html](https://www.unicef.org/media/media_24321.html).
11. Tadesse, H., Deribew, A., & Woldie, M. (2009). Predictors of defaulting from completion of child immunization in south Ethiopia, May 2008–A case control study. *BMC public health*, 9(1), 1-6.
12. Legesse, E., & Dechasa, W. (2015). An assessment of child immunization coverage and its determinants in Sinana District, Southeast Ethiopia. *BMC pediatrics*, 15(1), 1-14.
13. Timane, A. J., Oche, O. M., Umar, K. A., Constance, S. E., & Raji, I. A. (2017). Clients' satisfaction with maternal and child health services in primary health care centers in Sokoto metropolis, Nigeria. *Edorium Journal of Maternal and Child Health*, 2, 9-18.
14. Salah, A. A., Baraki, N., Egata, G., & Godana, W. (2015). Evaluation of the quality of Expanded Program on immunization service delivery in primary health care institutions of Jigjiga Zone Somali Region, Eastern Ethiopia. *European Journal of Preventive Medicine*, 3(4), 117-123.
15. Hussien, A. (2015). *Assessment of Maternal Satisfaction Towards Childhood Immunization and*

- Its Associated Factors in MCH Clinic, at Kombolcha, in Amhara Regional State, Northern Ethiopia* (Doctoral dissertation, Addis Ababa University).
16. Sarkar, D. D., Banerjee, D. S., Maji, D. B., & Saharoy, D. S. (2015). Satisfaction of mothers attending immunisation clinic in a slum area of North Kolkata: a cross-sectional study. *IOSR Journal of Dental and Medical Sciences*, 14(6), 48-51.
  17. Salah, A. A., Baraki, N., Egata, G., & Godana, W. (2015). Evaluation of the quality of Expanded Program on immunization service delivery in primary health care institutions of Jigjiga Zone Somali Region, Eastern Ethiopia. *European Journal of Preventive Medicine*, 3(4), 117-123.
  18. WHO/UNICEF. (2018). Ethiopia: WHO and UNICEF estimates of immunization coverage: 2018 revision Available: [https://www.who.int/immunization/monitoring\\_surveillance/data/eth.pdf](https://www.who.int/immunization/monitoring_surveillance/data/eth.pdf)
  19. WHO/UNICEF. (2019). Ethiopia: WHO and UNICEF estimates of immunization coverage: 2018 revision 2019, Available: [https://www.who.int/immunization/monitoring\\_surveillance/data/eth.pdf](https://www.who.int/immunization/monitoring_surveillance/data/eth.pdf)
  20. World Health Organization. (2019). WHO vaccine-preventable diseases: monitoring system. 2019 global summary, Available: [http://apps.who.int/immunization\\_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=ETH&commit](http://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=ETH&commit)
  21. Central Statistical Agency (CSA) [Ethiopia] and ICF. (2016). Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF, 187-190.
  22. Ahmed, T., Assefa, N., & Asrat Demisie, A. K. (2014). Levels of adult patients' satisfaction with nursing care in selected public hospitals in Ethiopia. *International journal of health sciences*, 8(4), 371.
  23. Meleko, A., Geremew, M., & Birhanu, F. (2017). Assessment of child immunization coverage and associated factors with full vaccination among children aged 12-23 months at Mizan Aman town, bench Maji zone, Southwest Ethiopia. *International journal of pediatrics*, 2017.
  24. Alkhazrajy, P. D. L. A. (2016). "Satisfaction of Iraqi women regarding childhood immunization services applied at primary healthcare centers in Baghdad, Swift Journal of Medicine and Medical Sciences, 2;1-6.
  25. GebreEyesus, F. A., Assimamaw, N. T., GebereEgziabher, N. T., & Shiferaw, B. Z. (2020). Maternal Satisfaction towards Childhood Immunization Service and Its Associated Factors in Wadla District, North Wollo, Ethiopia, 2019. *International Journal of Pediatrics*.