Journal of Midwifery & Reproductive Health

JMRH.mums.ac.ir

Maternal Satisfaction towards Childhood Vaccine Services and Associated Factors in Public Health Facilities at Gondar, Ethiopia

Agerie Mengistie Zeleke (MSc)[1]*, Worku Chekole Tasew (MSc)[2], Getaw Wubie Asres (MSc)[3]

[1] Lecturer, Department of Educational Science, Psychological Counseling and Guidance Branch, Ataturk University, Erzurum, Turkey
[2] Lecturer, Department of, Department of Nursing, School of Public Health, Teda Health Science College, Gondar, Ethiopia
[3] Lecturer, Department of Public Health, School of Public Health, Teda Health Science College, Gondar, Ethiopia

ARTICLE INFO

Article type:
Original article

Article History:
Received: 28-Sep-2022
Accepted: 09-Apr-2023

Key words:
Maternal Satisfaction
Vaccine
Public health facility
CaregiverEthiopia

ABSTRACT

Background & aim: Around the world, vaccinations avert 4-6 million deaths annually, emphasizing the importance of ensuring maternal satisfaction for effective disease prevention. However, data on maternal satisfaction with immunization programs in Ethiopia is lacking. This study aimed to determine maternal satisfaction towards childhood vaccine services and associated factors in public health facilities at Gondar, Ethiopia.

Methods: This cross-sectional study was conducted in Gondar, Ethiopia, From May 1 to June 30, 2022. Data was collected from mothers visiting health facilities for immunization services. A two-stage random sampling technique was employed. Data was gathered using a researcher-made questionnaire. Bivariate and multivariate binary logistic regressions were conducted using SPSS (version 23.0).

Results: The prevalence of maternal satisfaction with childhood immunization services was 69.3% [95%CI: 65.5–73.1%]. Of the mothers, 45.3% had adequate knowledge, while 43.9% had a favorable attitude. Study participants who were 19 to 24 years old [AOR = 5.29; 95%CI: 2.58, 10.86], time taken less than one hour for a health facility [AOR = 3.03; 95%CI: 1.92, 4.77], and waiting less than thirty minutes in a health facility [AOR = 1.98; 95%CI: 1.24, 3.15], felt happy during the service [AOR = 4.00; 95%CI: 2.53, 6.34], had adequate knowledge [AOR = 2.91; 95%CI: 1.79, 4.73] and a favorable attitude [AOR=3.64;95%CI: 2.25,5.91)were significantly associated with maternal satisfaction during childhood immunization services.

Conclusion: Overall, mothers' satisfaction with the services provided for childhood vaccinations was quite low. Therefore, any interested parties must work harder on predictors to raise mothers' satisfaction with these services.

► *Please cite this paper as*:
Eyni S, Musavi SE, Ebadi M. Maternal Satisfaction towards Childhood Vaccine Services and Associated Factors in Public Health Facilities at Gondar, Ethiopia. Journal of Midwifery and Reproductive Health. 2024; 12(1): 4175-4186. DOI: 10.22038/JMRH.2023.68192.1997

Introduction

In order to combat diseases that can be prevented by vaccination, the World Health Organization (WHO) launched the Expanded Programme on Immunization (EPI) in 1974 (1). Ethiopia established the EPI programme in 1980 with the intention of reaching complete immunization coverage for all children under the age of two by 1990 (2). Since Reaching Every District (RED) and Sustainable Outreach Services (SOS), two new immunization strategies, were introduced in 2003, there has been evidence of improvement. Even though the nation is moving towards more equitable geographical coverage with construction and peripheral health facilities, system-wide barriers related to geographic coverage still exist as gaps, necessitating bridging strategies like the Enhanced Outreach Strategy (3). In

* *Corresponding author*; Agerie Mengistie Zeleke, Lecturer, Department of Educational Science, Psychological Counseling and Guidance Branch, Ataturk University, Erzurum, Turkey. Tel: 251975126560; Email: ageriemengistie@gmail.com

addition to barriers related to geographic barriers, the salaries of healthcare professionals, and technical support (4). Improvements in the population's access to EPI services have been made in large part due to the healthcare professionals' positive attitudes (5).

By boosting immunity, child immunization is one of the most effective and affordable global health strategies for lowering child sickness, lifetime disability, and mortality globally. It is also the most effective form of child health prevention, and it is essential to promoting human rights and reducing poverty (6). The main objective of EPI services is to lower the prevalence of childhood vaccine-preventable diseases (VPD) by achieving high levels of coverage with effective vaccines given at the proper ages at the proper intervals between doses for multiple-dose vaccines (7). As a result, WHO recommended that all countries establish national immunization programs, and provide standard services for under-five- years- old children (8). However, there are still challenges in addressing client satisfaction during child immunization services (9). Client satisfaction, which measures how much clients feel their needs and expectations are met by the services supplied, is a crucial aspect of health services and is strongly tied to their use (10-11). Coverage in Ethiopia has never attained the desired levels and intended sustainable development targets without addressing maternal satisfaction during routine immunization sessions (12) because it emphasises ensuring patient satisfaction as a means of secondary prevention of maternal mortality since satisfied women may be more likely to adhere to healthcare providers' recommendations (13).

According to many studies, maternal satisfaction with EPI treatments is a major factor in raising the standard of immunization services and, ultimately, expanding their age range of coverage (14). An important indicator of the quality of EPI services and overall health care is the amount of perceived satisfaction among mothers and caregivers who attend health care delivery facilities (15). Service structure, procedure, and outcome are the three main categories used to describe the quality of EPI services in the health sector (16). Since identifying children who are less likely to receive timely preventative interventions can be improved upon by quality assurance efforts that gauge childcare satisfaction with care (17). Mothers and other child caretakers who are pleased with the medical care are more likely to build a stronger and more lasting relationship with the calibre of EPI services, improving adherence, continuity of care, and eventually improving health outcomes (18). Emotional expectations lead to satisfaction, a general psychological condition that enhances clinical results, boosts patient retention, and lowers EPI malpractice claims (19). The highest priority should be given to providing high-quality healthcare in an effective and client-centered manner(20). Thus, patient satisfaction is therefore a crucial factor in raising the standard of healthcare services, even though it is a proxy for measuring the success of health outcomes (21).

Infectious diseases that can be prevented by vaccination killed about 3 million children worldwide, and each year, 2 million children in developing nations pass away before turning five, with many of them dying in their first year of life (22). Ethiopian children have a 30 times higher risk of dying before turning five than children in Western Europe (23). Due to infectious diseases that can be averted by immunization, a considerable percentage of child fatalities (4.4 million) in sub-Saharan African nations are attributed to insufficient immunization coverage (24). According to estimates, 472,000 children die before turning five each year, mostly from diseases that can be prevented by vaccinations, because the objective of universal childhood immunization has largely been unmet despite several efforts (25). According to the Ethiopian Mini Demographic and Health Survey (EDHS) report, the country's immunization coverage was just 76% in 2019, falling short of the stated government goal of 100% by 2025 (26).

Recent efforts have focused on the significance of maternal satisfaction for the effective delivery of childhood immunization services, and some interventions are also underway to improve maternal satisfaction. These interventions include making sure that there is a continuous supply of vaccines and related logistics,

streamlining the service process system, and offering training and education on childhood immunization (27, 28). Although there is considerable evidence from the community regarding the availability of EPI services, there is still a dearth of information regarding mothers' satisfaction with childhood immunization in healthcare facilities, especially in the study area. Increased mother satisfaction with immunization services will, as a proven fact, result in greater immunization coverage in the local region and across the nation. For mothers to stick to the service and achieve targeted control of vaccine-preventable diseases, it is also essential to investigate parameters linked to maternal satisfaction with regards to childhood immunization. This study, therefore, was conducted to determine the level of maternal satisfaction with child immunization services and its associated determinants at public health facilitities at Gondar in Northwest Ethiopia.

Materials and Methods

From May 1 to June 30, 2022, a facility-based cross-sectional study was undertaken. Gondar, one of the 26 districts of the Central Gondar Zone in northwest Ethiopia, is where the study was carried out. The study was conducted in Gondar, one of the 26 districts found in the Central Gondar Zone, in Northwest Ethiopia. Gondar is the capital city of the Central Gondar Zone, located 748 km north of Addis Ababa. In the town of Gondar, there are nine public health facilities. There is one comprehensive referral hospital as well as seven medium private clinics and 12 junior private clinics spread throughout eight health centers and six health posts. According to the Gondar Town Health Administration Office report, the facility sees 150–170 customers on average per day for EPI services, and it receives estimated 1910–2440 clients per month for childhood immunization services.

The mothers who will participate were chosen using a two-stage random sampling technique. First, out of the nine health facilities in Gondar town, we randomly chose six (66.6%) of them for the study. All mothers with children under one year old who were present at the chosen health facilities were then interviewed as part of the second stage of sampling. Based on a proportional number of mothers who were observed at the health facilities over the previous three months, the total number of moms whose children's ages are under one year in each health facility was estimated. The sampling interval (Kth value) was derived by dividing the predicted number of mothers in each health facility with children under one year of age by the calculated sample size. After that, information was gathered from each additional mother at those healthcare facilities with children younger than one year until the necessary sample size was reached. If more than one eligible mother lived at a health facility, the mother with the youngest child was chosen at random.

All mothers or caregivers whose children’s age is less than one year and who visited the health facility for childhood immunization service at Gondar town public health facilities were considered the source population, while those whose children’s age is less than one year and who visited the health facility for childhood immunization service during the data collection period at Gondar town public health facilities were considered the study population. All mothers or caregivers with children under the age of one who visited the health facility for childhood immunization services at Gondar town public health institutions during the data collection period were included in the study, whereas mothers or caregivers who were unable to hear or seriously ill during the interview, those who were referred from other health facilities for other health care services, those not having immunization follow-up in Gondar town public health institutions, and mothers coming to the health facility for campaign catch-up immunization were excluded from our study.

Eleven questions about child immunisation services were used to gauge mothers' understanding of those services. Each right response received one point [1], whereas the wrong ones received zero [0]. A person was considered to have inadequate knowledge if their score was at or below the mean, and acceptable knowledge if it was at or above the mean. Six questions graded [1] strongly disagree, [2] disagree, [3] neutral, [4] agree, and [5] highly agree on a five-point Likert scale were

used to gauge views towards childhood immunisation services. Mothers' sentiments towards child immunisation service elements were simplified (from agree and strongly agree) into two categories: "agree" and "disagree" for ease of analysis. Then, those who responded below the mean were considered to have an unfavourable attitude, and those who scored at or above the mean were considered to have a favourable attitude (10, 18, 21, 29).

Using adapted and modified [32 versions of 21 satisfaction-related items categorized into health workers' relationships, attitude, and communication (11 items), the physical environment (6 items), and the immunization system (4 items), maternal satisfaction with childhood immunization services was assessed. A 5-point Likert scale is used to score each tool that is used to gauge satisfaction (extremely dissatisfied, 2 dissatisfied, neutral, 4 satisfied, and 5 very satisfied). First, the mean scores of the 21 satisfaction-testing items were added to get the overall maternal satisfaction level. The satisfaction threshold was then calculated using the demarcation threshold formula, which is total highest score minus the total lowest score, divided by two plus the total lowest score. Finally, mothers' overall satisfaction was categorized and dichotomized into "satisfied" and "not satisfied." Based on this, mothers who scored above 69% on the satisfaction measurement tool were considered "satisfied", whereas mothers who scored 69% on the satisfaction measurement tool were considered "dissatisfied" with childhood immunization services.

The sample size (n) was determined using a single population proportion formula while taking into account the following assumptions: a 95% confidence interval; the proportion of mothers who are satisfied with their child's vaccination rate (p=68.2%) as determined by earlier research carried out in the Wadla District, North Wollo, Ethiopia (30); Za/2 = 1.96; and d = 5%, which represents the margin of error. The overall sample size is increased to 370.5 by assuming a 10% non-response rate, n=(za/2)2 * p*(1-p)/d2=335, and the number of mothers or carers is increased to 556 by employing a design effect of 1.5.

The sample size is also determined using factors that have been linked to maternal satisfaction with immunization services, such as divorced marital status (AOR = 0.51), secondary education (AOR = 0.65), positive attitude (AOR = 1.75), waiting time (AOR = 0.65), greeting/welcoming approach (AOR = 9.63), and knowledge of the most recent vaccine (AOR = 5.26) that have been linked to this outcome statistically (21). However, it was discovered that the sample size was larger than the predictors when it was calculated using a single population proportion (i.e., the proportion of maternal satisfaction). As a result, 556 were chosen as the sample size for this study, which was determined using the single population proportion formula (i.e., proportion of mother satisfaction).

After a thorough examination of related literatures (31-32), a pre-test and structured questionnaire were created and validated in the context of the local culture, language, and other factors. These tools were then employed for this investigation. To maintain uniformity, the questionnaire was first created in English, then translated into Amharic (the local tongue), and finally returned to English. To determine the validity and reliability of the questionnaire, a pre-test was carried out at the Dabat health facility using a sample size of 5.0% of the overall study sample. On the basis of the results of the pre-test, the questionnaire was modified. The data was gathered using a questionnaire created by the researcher. The content validity index was evaluated based on the insights of subject-matter authorities in order to confirm the validity and dependability of the tool. 45 mothers participated in a pilot study to gauge the reliability of the questionnaire. A statistical analysis utilizing Cronbach's alpha revealed that the questionnaire was reliable; its value was 0.831.

The survey instrument and an ethical approach to research participants were the main areas of attention for the data collectors' training. Face-to-face interviews with study participants were done by four BSc midwives to gather data. Additionally, the supervisor evaluated and double-checked the questionnaires for completeness and consistency, and any relevant feedback was immediately supplied to the data

collectors. Epi-data version 4.6 was then used to enter the data. Once the data entry was completed, the Statistical Package for Social Science (SPSS) version 23.0 was used to export the data after it had been entered and cleaned up. Basic data quality assurance procedures were carried out, including sorting and statistical outlier detection as well as data cleaning using browsing of sorted data tables, graphical exploration of distributions using box plots, histograms, and scatter plots, frequency distributions, and cross tabulations. Statistical analysis

Logistic regression analysis was used to get the bivariate (crude odds ratio [COR]) and multivariable (adjusted odds ratio [AOR]) values with a 95% confidence interval [CI]. Variables with a p value of 0.25 from the bivariate analysis were eligible for the multivariate analysis. Variables with a significance level of p 0.05 were considered statistically significant and independently linked with maternal satisfaction in the multivariable logistic regression analysis. We used standard error at the cutoff value of 2 to test for multi-collinearity among independent variables, and we discovered a maximum standard error of 1.0, which indicated no multi-collinearity. The cut-point p-value of > 0.05 was used to determine the model's fitness using the Hosmer-Lemeshow goodness of fit test, and it had a 0.721 value.

Prior to data collection, ethical review committee approval was received from the School of Medicine at the University of Gondar with the ethical letter protocol number: EIR/901/02/2022. Permission letters were received from the Gondar Town Health Department's office once an official letter had been delivered to their offices. Respondents were also made aware of their unrestricted ability to quit the process at any moment. Each respondent's information was kept confidential, and the participants were given a clear explanation of their anonymity.

Results

Socio-demographic characteristics

A total of 554 participants were involved in the study, yielding a response rate of 99.6%. With a standard deviation of 6.71 years, the mother's or caregiver's age was 28.42 years on average. Eighty-three percent (83.8%) of the mothers or caretakers who took part in this study resided in urban areas. By their religion, more than 56% of the respondents identified as Orthodox Christians, and the majority of them, 448 (80.8%) were married. The majority of research participants had three or more kids.

Table 1: Socio-demographic characteristics of participants in a public health facility at Gondar town, Ethiopia, 2022 (n = 554)

Variables	Frequency (%)
Age of mothers (in a year)	
19-24	137 (24.7)
25-30	274 (49.5)
≥31	143 (25.80
Residence	
Urban	464 (83.8)
Rural	90 (16.2)
Religion	
Orthodox	314 (56.7)
Muslim	130 (23.5)
Protestant	88 (15.8)
Catholic	22 (4.0)
Marital status	
Married	448 (80.8)
Single	53 (9.6)
Divorced	26 (4.7)
Widowed	27 (4.9)
Educational status	
No formal education	118 (21.3)
Primary level	124 (22.4)
Secondary level	143 (25.8)
Diploma and above	169 (30.5)
Maternal occupation	
Housewife	197 (35.6)
Civil servant	123 (23.3)
Private	103 (18.6)
Merchant	99 (17.9)
Student	32 (4.6)
Number of children	
≤3	256 (46.2)
>3	298 (53.8)
Family monthly income (mean)	
<5902.69	229 (41.3)
≥5902.69	325 (58.7)

Regarding respondents' education status, one-third (30.5%) of the mothers had a diploma or higher educational background, and one hundred ninety seven (35.6%) of study participants were housewives, followed by 129

(23.3%) government-employed servants (**Error! Reference source not found.**).

Access and process to vaccine services

To evaluate and process factors associated with children's immunization services, a variety of items were used. Accordingly, more than two-thirds (73.8%) of the study participants went to at medical facility for immunization services at least three times. 343 (61.9%) of the study's participants arrived at medical facilities by car, in terms of the availability of current immunization services. Two hundred ninety five (53.2%) mothers reported waiting longer than 30 minutes to receive services, while 193 (34.9%) mothers needed more than an hour to go to a health center for immunization services. Four hundred fifty (81.2%) of mothers and carryout of the total number of respondents were aware of the current vaccine given. Finally, most (83.2%) of study participants were unaware of the vaccine's side effects (Table 2).

Table 2. Access and process-related immunization service factors for mothers at Gondar public health, Ethiopia, 2022 (n = 554)

Variables	Frequency (%)
Faced happen after taking vaccination	
Yes	87 (15.7)
No	406 (73.3)
I don't remember	61 (11.0)
Frequency visited health facility for vaccination services	
More than 3 times	409 (73.8)
Less than 2 times	145 (26.2)
Time taken to the health facility	
≥60 minute	361 (65.2)
<60 minute	193 (34.8)
Waiting time in the hospital	
≥30 minute	295 (53.2)
<30 minute	259 (46.8)
Means of transportation	
On foot	211 (38.1)
By vehicle	333 (61.9)
Happy when your child got a vaccine	
Yes	379 (68.4)
No	175 (31.6)
Greet health worker	
Yes	431(77.8)
No	123 (22.2)
information given about the current vaccine	
Yes	450 (81.2)
No	104 (18.8)
Information given about type of the vaccine your child taken	
Yes	408 (73.6)
No	146 (26.4)
Information given for next dose of the vaccine	
Yes	194 (35.0)
No	360 (65.0)
Information given about the next schedule	
Yes	393 (70.9)
No	161 (29.1)
See side-effect after vaccination	
Yes	93 (16.8)
No	461 (83.2)

Mothers' knowledge about childhood immunization services

Out of the total study participants, 251 (45.3%) had adequate knowledge about current childhood immunization services. The results of the knowledge assessment items showed that nearly two-thirds of the respondents (73.3%) were aware of EPI target diseases, and about 488 (88.1%) had information about the next vaccination schedule (Table 3).

Table 3. Knowledge of mothers about childhood immunization services at Gondar public health facilities, Ethiopia, 2022 (*n* = 554).

Variables	Frequency (%)
know the EPI targeted diseases	
Yes	406 (73.3)
No	148 (26.7)
Type of diseases that vaccine can prevent	
Infectious diseases	457 (82.5)
Non-communicable diseases	74 (13.3)
Evil sprits	23 (4.2)
Vaccinate necessary for breast feeding child	
Yes	499 (90.9)
No	55 (9.1)
Know that that vaccination is not harmful	
Yes	403 (72.7)
No	151 (27.3)
Know the next vaccination schedule of your child	
Yes	488 (88.1)
No	66 (11.9)
Know about the side effects of EPI vaccines	
Yes	355 (64.1)
No	199 (35.9)
Fever side-effects in child's vaccines (n=355)	
Yes	297 (83.7)
No	58 (16.3)
Diarrhea side-effects in child's	

Variables	Frequency (%)
vaccines(n=355)	
Yes	180 (50.7)
No	175 (49.3)
Vomit side-effects in child's vaccines (n=355)	
Yes	157 (44.2)
No	198 (55.8)
Un able to feeding side-effects in child's vaccines (n=355)	
Yes	209 (58.9)
No	146 (41.1)
Know child face any health problem after taking vaccination	
Yes	87 (15.7)
No	406 (73.3)
I don't know	61 (11.0)
Knowledge mean score	
Adequate knowledge	251 (45.3)
Inadequate knowledge	303 (54.7)

Maternal attitudes about childhood immunization services

Out of the total study participants, only 44.9% of the respondents had a favorable attitude towards childhood immunization services. Four hundred sixty eight (84.5%) of the study participants were in compliance with the immunization schedule. The majority, 486 (87.7%) of the study participants, believed that vaccination was beneficial for the wellbeing of their children. Most, 424 (76.6%) of the study participants, were presumed to believe that vaccination makes infants sick, and 463 (83.6%) of the study participants didn't believe that it could bring the infants even to death (Table 4).

Maternal satisfaction with childhood vaccine service

Using 21 satisfaction-related factors divided into connections with health workers, attitude and communication, the physical environment, and the immunization system, maternal satisfaction with child immunization was assessed. In order to determine total satisfaction, the mean scores of the 21 satisfaction factors were summed. The lowest score was determined to be 100, while the maximum total satisfaction score was 500. The threshold score for satisfaction was determined using the demarcation threshold formula, which is (total highest score minus total lowest score)/2 + total lowest score. Accordingly, the finding showed that the threshold value for maternal satisfaction was found to be 300. Based on this, the overall prevalence of maternal satisfaction with childhood immunization services was 69.3% (95% CI: 65.5–73.1%).

Factors associated with maternal satisfaction

Our findings demonstrate that maternal satisfaction with childhood immunization services rose once confounding variables were taken into account in multivariable logistic regression analysis. As a result, mothers aged 19–24 were 5.29 times more likely than participants over 31 years old to be satisfied with childhood immunization services [AOR = 5.29; 95% CI: 2.58, 10.86].

The odds of maternal satisfaction with childhood immunization services were 3.03 times (AOR = 3.03; 95; 95% CI: 1.92, 4.77) higher for participants who used less than one hour to get childhood immunization services than those who used more than one hour to get vaccine services. Similarly, mothers who waited less than 30 minutes in a health facility for services related to childhood immunization had 1.98 times higher odds of being satisfied than participants who waited longer in a health facility (AOR = 1.98; 95% CI: 1.24, 3.15).

The odds of developing maternal satisfaction were 4.00 times higher in participants who feel happy during childhood immunization services than in participants who do not feel happy during childhood immunization services (AOR = 4.00; 95%CI: 2.53, 6.34). Those with adequate knowledge were 2.91 times more likely to be maternally satisfied compared to those with inadequate knowledge (AOR = 2.91, 95% CI: 1.79, 4.73), and participants who had a favorable attitude toward childhood immunization services were 3.64 times more likely to be maternally satisfied by giving childhood immunization services compared to those with an unfavorable attitude (AOR = 3.64, 95% CI: 2.25, 5.91) (Table 5).

Table 4. Attitude of mothers towards childhood immunization services at Gondar public health facilities, Ethiopia, 2022 (n = 554)

Variables	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
Compliance to immunization schedule is important	14(2.5)	14(2.5)	58(10.5)	339(61.2	129(23.3
Vaccination is beneficial for the wellbeing of your children	12(2.2)	23(4.2)	33(6.0	344(62.1)	142(25.6)
Vaccination makes infants sick	79(14.3)	281(50.7)	64(11.6)	67(12.1	63(11.4)
Vaccination could bring the infants to death	77(12.9)	259(46.8)	127(22.9)	65(11.7)	26(4.7)
Belief vaccine protect all infection disease	9(1.6)	18(3.2)	66(11.9)	332(59.9)	129(23.3)
Think vaccine protect infection disease than political implication	81(11.6)	280(50.5)	65912.70	679(11.1)	61(11.0)

Table 5. Bivariate and multivariable logistic regression analysis of factors associated with maternal satisfaction towards childhood immunization service at Gondar town public health facility, Ethiopia, 2022(n=554)

Variables	Maternal satisfaction		COR (95% CI)	AOR(95% CI)	P-Value
	Satisfied	Not satisfied			
Mathrenal age (in a year)					
19-24	117	20	3.55(1.98,6.36)	5.29(2.58,10.86)	<0.000
25-30	178	96	1.13(0.70,0.71)	1.06(0.63,1.78)	0.819
≥31	89	54	1.00	1.00	
Maternal education					
No formal education	83	35	1.00	1.00	
Primary level	78	46	0.72(0.42,1.22)	0.60(0.31,1.18)	0.139
Secondary level	101	42	1.04(0.60,1.73)	0.52(0.27,1.03)	0.062
Diploma and above	122	47	1.11(0.65,1.84)	0.95(0.49,1.83)	0.870
Family income (by mean)					
≤5920.68	146	83	1.00	1.00	
>5920.69	238	87	1.55(1.08,2.24)	1.20(0.75,1.92)	0.441
Frequency visited health facility for services					
More than 3 times	293	145	0.56(1.11,2.93)	1.11(0.65,1.87)	0.731
Less than 2 times	91	25	1.00	1.00	
Time taken to get childhood immunization services					
≥60 minutes	284	77	1:00	1.00	
<60 minutes	100	93	0.29(0.230,0.496)	3.03(1.92,4.77)	<0.000
Waiting time					
≥30 minutes	184	111	1.00	1.00	
<30 minutes	200	59	2.05(1.47,2.97)	1.98(1.24,3.15)	0.004
Happy during childhood immunization services					
Yes	302	77	4.45(3.02,6.56)	4.00(2.53,6.34)	<0.000
No	82	93	1.00	1.00	
Information given about the current vaccine					
Yes	326	124	2.09(1.35,3.23)	1.65(0.84,3.24)	0.149
No	58	46	1.00	1.00	
Information given about the current vaccine type					

Variables	Maternal satisfaction		COR (95% CI)	AOR(95% CI)	P-Value
	Satisfied	Not satisfied			
Yes	296	112	1.74(1.17,2.59)	1.66(0.91,3.11)	0.058
No	88	58	1.00	1.00	
Information given about the current vaccine					
Yes	129	65	0.82(0.56,1.190	0.63(0.38,1.040)	0.070
No	255	105	1.00	1.00	
Knowledge					
Good	198	53	2.35(1.61,3.44)	2.91(1.79,4.73)	<0.000
Poor	186	117	1.00	1.00	
Attitude					
Favorable	193	50	2.43(1.65,3.57	3.64(2.25,5.91)	<0.000
Unfavorable	191	120	1.00	1.00	

Discussion

Maternal satisfaction with pediatric immunization services is a key metric for assessing the caliber of pediatric immunization services provided in medical facilities. As a result, we investigated the likelihood of satisfaction and the variables that affect it among women requesting child immunization services at a public health facility in Gondar, Ethiopia. We discovered a 69.3% prevalence of maternal satisfaction. The study also found that factors significantly associated with satisfaction among mothers during childhood immunization services included mothers aged 19 to 24 years old, participants who used less than one hour to receive childhood immunization services, mothers who waited less than thirty minutes in a health facility to receive childhood immunization services, mothers who felt happy during childhood immunization services, and mothers who had sufficient knowledge and a positive attitude.

This rate of mother satisfaction in our study was lower than studies conducted in Egypt (95.2%) (18), in Nigeria (84.5%) (33), Shenen Dugo District, Oromia Regional State, Eastern Ethiopia (79.1%) (34), and Dawie Harewa District, Northeast Ethiopia (84.65%) (35). This discrepancy might be due to differences in the method of computing the estimate of satisfaction. In this study, the prevalence of maternal satisfaction was estimated using the demarcation threshold formula. However, the former studies estimated the prevalence of maternal satisfaction based on the global measure assessment tools, mean and median of the data set, respectively. The other possible reason for this difference might be the lower educational status of the study areas. For instance, the level of maternal education helps mothers understand the services provided and seek better-satisfying health services. Only 27.1% of mothers in this study had a secondary education, whereas in the previous study, 63.8% of mothers living in rural areas who frequently visited primary health care facilities for immunization services had a secondary education. However, this rate was in line with the prevalence of maternal satisfaction reported by a study conducted in the South Wollo Amhara Region of Ethiopia (71.9%) (36). This might be due to similarities in the socio-demographic status of town dwellers in the same Amhara Region, Ethiopia.

According to our findings, mothers aged 19 to 24 years old were 5.29 times more likely to be satisfied with the childhood immunization service than participants aged greater than 31years old. This finding is supported by a study conducted in Este Town, Eastern Ethiopia (37). The similarity could be explained by the fact that mothers in the younger age groups are more familiar with information about the quality of care expected during child immunization services (36). Similarly, our data revealed that shorter service waiting times (i.e., less than thirty minutes) to get vaccinated were another significant predictor of maternal satisfaction with the childhood immunization service. The result is in line with the study findings from Jigjiga (37) in Ethiopia, in North Wollo (36), and in Nigeria (38).

The findings of the current study also revealed that a welcoming approach by health care providers had a positive effect on the level of

maternal satisfaction with childhood immunization services. For example, mothers who got greetings were 4.0 times more likely to be satisfied than mothers who did not get greetings or a welcoming approach. Effective interaction between health care providers and clients can address the concerns of vaccine-supportive parents and motivate a hesitant parent towards vaccine acceptance. In addition to this, good communication between clients and healthcare providers has also been described as the single most important component of good medical practice (39).

Those with adequate knowledge were 2.91 times more likely to report maternal satisfaction compared to those with inadequate knowledge, and participants who have a favourable attitude towards childhood immunization services were 3.64 times more likely to report maternal satisfaction by giving childhood immunization services compared to those with an unfavourable attitude. This can be explained by the fact that those who had adequate knowledge and a favourable attitude towards childhood immunization services could understand the benefit of immunization services for those in need. This association might be observed because the knowledge of the vaccine helps the mothers develop a sense of protecting their children from a certain type of communicable disease. This finding consistent with one obtained in southwest Ethiopia (40). The other possible explanation for this might be due to the fact that having a positive attitude about the advantages and disadvantages of childhood immunization services enables mothers/caregivers to engage in a friendly approach during taking services.

The current study's strength may be its use of an institutional-based data collection method with valid and standardized instruments. Because this is a cross-sectional study, a cause-and-effect relationship cannot be established, recall bias cannot be completely eliminated, and the lack of a qualitative study to supplement the quantitative data could be mentioned as a potential limitation of the current study.

Conclusion

The overall level of satisfaction among mothers with services related to childhood immunization was noticeably lower when compared to other studies. Thus, it is advised that more efforts be made to increase the mother's satisfaction with care, particularly for mothers between the ages of 19 and 24, participants who used less than an hour to receive childhood immunization services, mothers who waited less than thirty minutes in a health facility to receive childhood immunization services, mothers who felt happy during childhood immunization services, and mothers who had sufficient knowledge and a positive attitude, all of which were significant factors.

It is also recommended that the district health office department, in collaboration with the district's healthcare providers, plan a regular outreach campaign activity to increase mothers' awareness and attitude towards childhood immunization by emphasising the importance of compassionate and respectful care. It is also necessary to increase the accessibility of general healthcare services provided at the units, particularly by lowering service waiting times, time taken, and the greeting/welcoming approach of healthcare providers in health institutions, in order to increase maternal satisfaction during childhood immunization services. Finally, we advocated for a more thorough and in-depth qualitative investigation.

Acknowledgements

We would first want to express our gratitude to Gondar Town Administration Health office for granting permission to conduct the study and for providing data. We also value and thank the participants for their cooperation throughout data collection, as well as the supervisors and data collectors.

Conflicts of interest

Authors declared no conflicts of interest.

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