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Research Article

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Assessment of Institutional Delivery Utilization and Influencing Factors Among Mothers who Gave Birth in the Last One Year in Shaggar City, Oromia, Ethiopia, 2025

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Abstract

Background: *Maternal mortality reduction is a global priority,particularly in developing countries like Ethiopia,where the ratio is among the highest in the world.Increasing the presence of skill ed healthcare providers during pregnancy and delivery is essential to lowering the maternal death ratio while improving maternal health. However, delivery service is significantly lower when compared to mother attending antenatal care (ANC) in Shaggar city. Therefore, this study aimed to assess factors affecting institutional delivery utilization among mothers who gave birth in the last One year in Shaggar city,Oromia, Ethiopia.*

Objective: *To assess Institutional delivery utilization and influencing factors among mothers who gave birth in the last one year in Shaggar city, Oromia, Ethiopia*

Methods: *A community-based cross-sectional study was conducted among mothers with birth in the last one year from January to March 2025. A multistage sampling method was utilized to select 642 participants.Data was gathered through a structured questionnaire, which was administered by trained data collectors. The data was entered into KoboToolbox and subsequently exported to SPSS version 27 for analysis.Descriptive statistics were employed to provide a summary of the data. Both bivariable and multivariable logistic regression models were utilized for analysis.A p-value of less than 0.2 in the bivariable analysis was deemed necessary for variables to qualify as candidates for the multivariable logistic regression model. To determine a statistically significant association, the adjusted odds ratio along with its 95% confidence interval and a p-value of less than 0.05 were utilized.*

Results: *A total of 642 mothers participated in the study, with response rate of 100%. Mothers residing in urban areas(AOR=0.23; 95 % CI: 0.09 - 0.58), Per-Urban areas(AOR=0.14; 95 % CI: 0.05- 0.38), Educational (AOR=0.09 (95% CI: 0.02 to 0.36)),Households having monthly income (OR 0.29 , 95% CI=0.11- 0.83), far from health facility (AOR=7.16; 95 % CI: 0.6,20- 8.27), measures taken to assure privacy (AOR (0.14, 95% CI (0.01-1.40)), providers explaining procedure (AOR (0.21, 95% CI (0.04- 1.13)) have an independently associated with institutional delivery services utilization.*

Conclusions: *In this study, he overall utilization of institutional delivery services at government health facilities for mothers who gave birth in the past year in Shaggar City was low in comparison to the coverage of antenatal care (ANC) follow-up at Health institutions.The Mother education Status,Monthly income, Far from health facility, measures to assure privacy,and providers explained procedures before examination were identified as predictors of the outcome Therefore, the health sector needs to develop intervention strategies aimed at enhancing the utilization of skilled delivery services at the government health facility in Shaggar City.*

Keywords: Institutional Delivery, Service, Knowledge, Utilization.

Introduction

A delivery service known as "skilled care at delivery" is given by qualified healthcare professionals wh o have the skills to manage normal pregnancies, deliveries, and the postpartum period. Now adays, maternal mortality is a major problem for the entire world. The World Health Organization (WHO) estimates that every day, 800 women worldwide lose their lives to preventable deaths related to pregnancy and child birth. A key strategy to improve the use of skilled delivery is to provide high- quality delivery care services [1-3]. Globally, about 139 million births occur every year , and there were nearly 289,000 maternal fatalities in 2013 year. In addition, every year, over 2.9 million infants die away in the first 28 days of life and 2.6 million stillbirths may occur.

Research from across the world demonstrates that developing nations are the most afflicted, taking responsibility for about 99% of maternal mortality, with Sub-Saharan Africa (SSA) alone accounting for 62% [4]. This unfortunate event is caused by several reasons, such as the region's insufficient use of skilled birth attendants (SBAs) during deliveries and the lack of comprehensive emergency obstetric care.

The global maternal mortality rate (MMR) in 2020 was anticipated to be 223 maternal deaths per 100,000 live births, which represents a one-third (34.3%) drop for the whole 20-year period. The average annual rate of reduction (ARR) between 2000 and 2020 was 2.1%, meaning that the worldwide MMR decreased by 2.1% on average annually. To reach the SDG global aim by 2030, an average annual rate of return (ARR) of 11.6% will be required in the ten years remaining for observation (2021–2030) [5].

Most maternal deaths occur in vulnerable and humanitarian areas including Sub-Saharan Africa, Central Asia, and Southern Asia. Despite the promotion of institutional delivery, home delivery is still widespread in poor countries like Ethiopia because access to health facilities is more difficult in hard-to- reach locations due to distance, restricted transportation, and a lack of sufficient equipment. This raises the number of maternal deaths [6]. To reduce preventable maternal and newborn deaths, the World Health Organization (WHO),the United Nations International Child Emergency Fund (UNICEF), and other governmental and non-governmental organizations (NGOs) are now focusing more on high- impact survival programs, with an emphasis on enhancing the standard of care at birth [7].

Internationally, quality of care is becoming more widely acknowledged as a crucial component of the unfinished maternal and newborn health agenda, particularly about care during childbirth [8]. According to Donabedian, quality care is a type of care that is expected to maximize an inclusive measure of client welfare, after one has taken account of the balance of expected gains and losses that attend the process of care, and it focuses on three distinct factors: the structure (organizational factors that define the health system under which care is delivered like infrastructure, equipment, drugs, and supplies, and human resources); the process (interactions between mothers and healthcare professionals); and the outcome (consequences of care) [9]. Ethiopia has been implementing an initiative to improve the quality of maternal health, has set a target to increase the proportion of delivery services utilization at their last care visit to 75% by 2024/25 in health sector transformation plan II [10]. Maternal mortality during pregnancy and delivery continues to be a major public health concern. Making institutional delivery more accessible is one of the most crucial strategies to reduce maternal death from childbirth.

Developing strategies to improve facility-based childbirth required knowledge of the institutional delivery elements. This study assessed the utilization of institutional delivery services and associated factors to bridge the gap.

Methods and Materials

Study Area

The study was conducted in selected four Sub-City of Shaggar city in Oromia, Ethiopia. Shaggar city is one of Metropolitan city in the Oromia region, which is located surrounding Addis Ababa city. City residents are agricultural and semi-agrarian residents with a population of 2,111,769 among this male 1,021,459 and 1,090,310 are Females. Out of the total population of the City , 467,334 are females in the reproductive age group. Moreover, around 73,278 women are eligible for pregnancy and delivery. The Shaggar city has twelve (12) Sub-cities and 36 Aanaa's, as well as one public hospital, 26 health centers, and 71 health posts. This city was bordered in the west, east, north, and south by the West showa, East showa, and North showa and West-south showa zone.

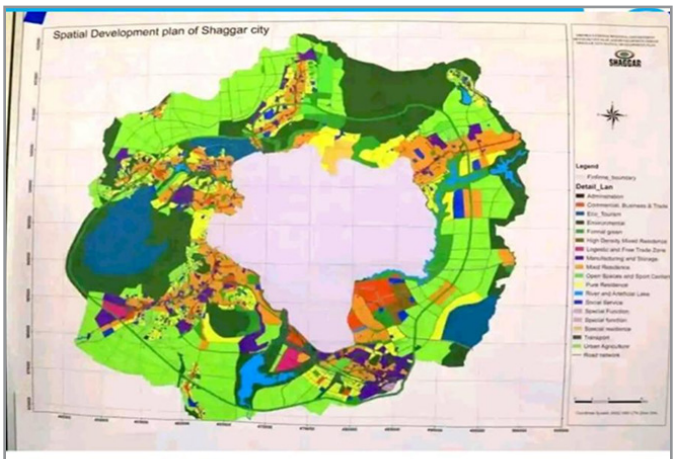

Figure: Spatial Development Plan of Shaggar City

Study Period
From 01 January to 30 March,2025

Study Design
A community-based cross-sectional study was conducted to assess utilization of institutional skill delivery among women who gave birth during the past one year.

Population Source Population
All women in reproductive age group (15-49) were found to be the source population for this study

Study Population
The study populations included in this study were all women who give birth in the past one year in Saggar city.

Eligibility Criteria
Inclusion Criteria
All mothers who gave birth in the last one previous year in selected sub-city of Shaggar city during the study period were included

Exclusion Criteria
Those critical ill and hearing impairment mothers were excluded from the study

Sample Size Determination and Sampling Procedures
Sample Size Determination Using an Institutional Delivery Utilization
Sample size was calculated using single population proportion by taking the prevalence of women gave birth to their current child at health institution.(74.4%) from the previous study conducted in Jimma Town, Southwest Ethiopia [11], a 5% marginal error, and a 95% confidence level (CL) and 10% non-response rate to increase power. Sample size was determined using single population proportion formula using the following assumption:

$$n = \frac{Z^2_{1-\alpha/2} * p(1-p)}{d^2},$$

Where, n-required sample size, Z-is critical value under standard normal distribution (Z = 1.96 for 95% confidence level), p-true population propulsion of healthy lifestyle (p = 0.744 based on previous study), and d-desire margin of error (d = 0.05). After substituting the appropriate numbers in the formula above the sample size will be:

$$n = \frac{1.96^2 * 0.744(1-0.744)}{0.05^2} = n = 292$$

Using the double population proportion, the sample size was computed for several relevant factors for institutional delivery utilization using a 95% confidence level, 80% power. However, the sample size was calculated for objective two was smaller than the sample size calculated for objective one. The final sample size was adjusted by adding a 10% non-response rate, using a design effect of 2, and finite population adjustment, resulting in a total sample size of 642.

Sampling Technique and Procedures
Multi stage sampling technique was used to select study subjects,The sample size was distributed to twelve Aanaa of selcted four (4) Sub-city (Malka Nano Sub-city,Gelan Guda sub-city,Laga Tafo ,and Gelan sub-city) in Shaggar city proportional to the size of mothers who having antenatal care follow up in the last one year [12]. At each Aanaa level, mothers having antenatal care at health facility in the past one yea. The study participants were chosen using a systematic random sampling technique from Antenatal departments a total of 19205 from registration report in the last one year of selected four sub- city which is divided by the sample size (n = 642) to yield k=29. Then, the sample size is allocated to selected four sub-City proportionally (based on the number of antenatal care reporting in the last year). Study participants were selected by systematic random sampling in the sites of every 29th Antenatal care units. All eligible women listed in checklist (sampling frame) was obtained from the registration books of the antenatal care ward registered in selected health centers of four sub-city.

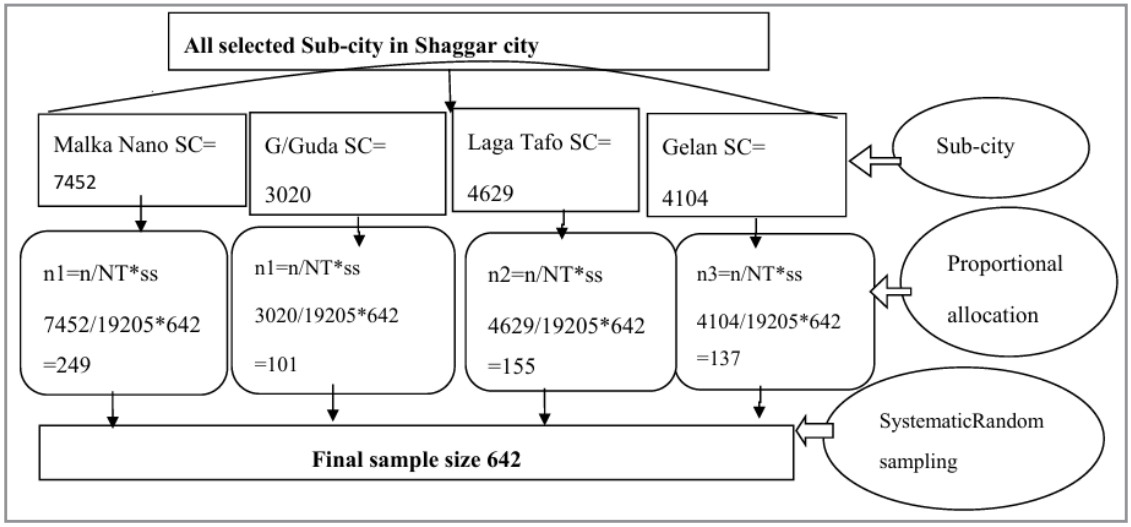

Figure 2: Schematic Presentation of Sampling Techniques Used to Select Study Subjects at Sub-City, 2025

Study Variables

Dependent Variable

Institutional Delivery Service Utilization

The Independent Variables

- **Socio-Demographic factors:** (Age, Religion, Marital status, Educational status,Occupation, Place of residence,Monthly income ,Partner education, and Residence)
- **Socio-Cultural Factors:** (cultural beliefs, traditions, and Habits)
- **Obstetric factors:** (Parity, History of ANC follow up, and Previous place of delivery)
- **Accessibility and Availability of Health Facilities Related Factors:** (Delivery Attending, place of delivery, Distance of Health Facility, Availability of, SBA, Medicines, supplies and services, and transportation)
- **Quality of Care at Health Institutions Related Factors:** Client-provider interaction,Quality of service, Privacy,Respect/dignity,Preference for providers and Comfortable surroundings (cleanliness), waiting area and adequacy of the room)
- **Knowledge Variable:** (pregnancy and labour danger sign, knowledge about pregnancy risk, and attitude on health facility)

Data Collection Method, Tool, and Procedures

The data collection questionnairewas adapted from different literature review tools. The questionnaire consists of socio-demographic characteristics (age, religion, educational status and occupational status and obstetric history including women's place of delivery for their last child birth, women's past obstetrical history and others. Data will be collected by trained health professionals.

Measurements

The outcome variables: (1) attendance of at least first ANC visits provided by a health professional and (2) delivery care by an SBA i.e. a Doctor, nurse, midwife, or a health officer. Wealth index, which is a composite measure of a household's cumulative living standard, will be derived from factor analysis of household assets, housing material, and access to water and sanitation services . Attitude score will be designed to assess attitude on three aspects of maternal health: birth preparedness, male involvement, and barriers to institutional delivery and it was derived from factor analysis of five Likert- scale statements. Barriers to institutional delivery focused on three aspects: costs, difficulties in getting to the health facility and handling of women by health facility staff.

Male involvement focused on perception towards the husband accompanying his wife to the health facility for ANC and delivery, and the role of men in child birth. The scores will be ranked . Being well prepared for the birth of the baby will be defined as having done any two of the following during pregnancy: identification of transport, saving money, identification of a blood donor, deciding on the facility where the baby born, and identification of a skilled birth attendant.

Data Collection and Data Collectors

Data was collected by using face-to-face interviews. The investigator was responsible for the overall management of the research, the development of the final questionnaire securing the participation of selected cases, identifying, training, and assignment of data collectors and supervisors. Data collectors were selected by sixteen (16) Bachelor of Science (BSC) public health Professionals based on their data collection experience and 5(five) Masters of public health (MPH) professional was recruited for supervisory activities. The principal investigator was making the overall supervision daily. The study procedures protected the patient's privacy by allowing anonymous and voluntary participation.

Data Quality Assurance

Both the data collectors and supervisors were trained for one day on the objective, methodology of the research, and data collection approach. The purpose of the training is to secure that all the data collectors have the same information about the study instrument and followed the same interview procedures. The training dealt with the purpose of the study, confidentiality, and how to approach and promote questions to the clients. Primarily the questionnaire is prepared in English and translated to Afaan Oromo language and back-translated into English by another person to check for consistency. Preliminary testing was carried out in 26(5%) of samples in health facilities that were not included in the final study. Based on the finding, grammatical sequences of questions were arranged on questionnaires.

The Principal Investigator and Supervisor checked the completeness, accuracy, and clarity of the daily data collection with the data collectors, and any necessary corrections were made before the start of the next data collection day. Finally, Data were entered into KoboToolbox, and imported to SPSS version 27 for data cleaning, coding, and crosschecking before data analysis.

Data Processing and Analysis

To minimize logical errors, the data was cleaned, coded, edited, and entered Kobo Toolbox, and then exported to SPSS version 27 for further analysis. Descriptive statistics such as frequency, percent, mean with standard deviation or median with interquartile range was used to summarize data. Logistic regression model was applied to assess the factors associated with health lifestyle practice among hypertensive patients. Independent variables reached p-value ≤ 0.25 during bivariate analysis was included to multivariable logistic regression model by stepwise model building method. Multicollinearity assumption was assessed by variance inflation factor (VIF) at cut-off point10%. Hosmer and Lemes how goodness-of-fit test was used to assess the model fitness. level of significance set at p-value <0.05.

Operational Definitions and Measurements

Institutional Delivery Service Utilization: In this study that when a mother gave birth at a healthcare facility (private clinic, hospital, or health center) [12].

Skilled Birth Attendants: Refer to people with midwifery skills (midwives, physicians, and nurses with additional midwifery training) and who have received the training required to diagnose, treat, or refer obstetric complications in addition to managing normal deliveries[13].

Antenatal Care Visitor: If a pregnant mother visited to a healthcare facility to get services related to her pregnancy.

Home Delivery: this refers to Mother give birth at her home or in a mother's home or the home of another person (neighbor, family, or relatives).

Close to Health Care Facility: This study used the term close to health care facility "if a woman travelled <5 km to reach health care facility".

Far from Health Care Facility: This study used the term far from health care facility, If a woman travelled >5km to reach health care facility.

Woman's Autonomy: If a woman decides to give birth herself or in partnership with her husband.

Women's knowledge: A woman would be considered knowledgeable for danger signs of pregnancy if she scores 50% and above for knowledge questions categorized as have good knowledge otherwise poor knowledge when one is given for correct answer and zero for incorrect answer [14].

Ethical Considerations

Ethical clearance was obtained from the institutional review board (IRB) (Ref. No. BFO/HQ/024/2017) of Oromia Regional Health Bureau Public Health Emergency Management and Public health research Directorate and Saggar City Public Health Emergency Management and Public health research Directorate. Written informed consent was obtained from each participant after explaining the purpose and procedure of the study. The participants have the right to withdraw from the study at any stage without providing any explanation. The confidentiality of respondents and collected data will be kept by conducting interview in secured place, restricting data access not collecting participant identifying information.

Results

Socio-Demographic Characteristics of Mothers

A total of 642 mothers who gave birth in four selected sub-cities participated in the interviews, achieving a response rate of 100%. The average age of the mothers was 27.20 years, with a standard deviation(SD) of ±4.76 years. Among the participants, 401 mothers (62.5%) were aged between 25 and 34 years. The youngest participant was 15 years old, while the oldest was 45 years old. Most of the of respondents,475 (74.0%) were from urban areas. Among the mothers interviewed, 250 (38.9%) had completed primary school (grades 1-8), while 41 (6.4%) were unable to read or write. Approximately 279 (43.5%) of them belong to the orthodox, followed by Protestant religion. Most mothers,623(97.0%), were married at the time of the interview. Among the total respondents regarding their husbands' education, 196 individuals (30.5%) completed primary school (grades 1-8), while 30 individuals (4.8%) are unable to read or write. More than half of the respondents,344(53.6%),were housewives, while 120 (18.7%) were employed in the private sector. Approximately 306 participants, representing 47.7% of the study reported having a monthly income (table 1).

Table 1: Socio-demographic chxs of Mothers who gave birth in the last one year in the Saggar city, Oromia, Ethiopia, 2025 (n=642)

Variables	Category	Frequency	Percent (%)
Residency	Peri-Urban	110	17.1
	Rural	57	8.9
	Urban	475	74
Age in years	<18	7	1.1
	19-24	173	26.9
	25-34	401	62.5
	>35	61	9.5
Motherlevelofeducation	Canwrite&readonly	41	6.4
	Cannotread&write	54	8.4
	Primaryschool(1-8)	250	38.9
	Secondaryschool(9-10)	143	22.3
	Preparatoryschool(11-12)	58	9
	Diplomaandabove	96	15
Religion	Orthodox	279	43.5
	Protestant	183	28.5
	Muslim	175	27.3
	Other	5	0.8
Marital status	Married	623	97
	Divorce	8	1.2
	Separate	4	0.6
	Cohabited	3	0.5
	Single	3	0.5

	Widowed	1	0.2
Husband level of education	Canwrite&readonly	31	4.8
	Cannotread&write	30	4.7
	Primary school (1-8)	196	30.5
	Secondary school (9-10)	145	22.6
	Preparatory school (11-12)	87	13.6
	Diploma and above	150	23.4
Occupation	House wife	344	53.6
	Private employee	120	18.7
	Daily laborer	95	14.8
	Government employee	55	8.6
	Farmer	17	2.6
	Student	2	0.3
	Other (specify)	9	1.4
Monthly income	<1000	110	17.1
	1001-2000	84	13.1
	2001-3000	88	13.7
	3001-4000	54	8.4
	>4001	306	47.7

Others (Wakefata and Living with Family or Self-Employed ***)

Obstetric Characteristics of Delivering Mothers

A total of 384 participants (59.8%) indicated that they had experienced less than two times pregnancies. More than half, 405 mothers (63.1%), had less than two live-birth children. Additionally, all 642 mothers (100%) participated in antenatal care (ANC) follow-ups. Majority of the mothers, 619 (96.4) were antenatal care (ANC) follow-up at Shaggar city Government health facility. During the study period, 52 cases (8.0%) experienced stillbirth or perinatal death. Approximately 100 mothers, representing 15.6%, attended eight antenatal care (ANC) appointments, while 313 mothers, or 48.8%, had their first ANC visit during the first trimester of pregnancy. Majority of the respondents, 612 (95.3%), indicated that they had previously given birth in a healthcare facility. In contrast, the remaining 30 mothers (4.6%) indicated that their last childbirth occurred at home, during travel, or in other locations. Out of the total number of mothers, 425 (66.2%) gave birth at the Shaggar City Government health facility, while the remaining 167 (26.0%) and 16 (2.5%) gave birth at government and private health facilities in Addis Ababa, respectively. Most respondents, 612(95.3%), reported that their childbirth was assisted by health professionals. In contrast, 23 respondents (3.6%) indicated that family members were present during the birth, while 5 respondents (0.8%) were assisted by traditional birth attendants. Out of the total, 445 mothers, representing 69.3%, experienced labor persist less than 12 hours (Table 2).

Table 2: Obstetric History of Mothers who gave BIRTH in the Last one year in Saggar City, Oromia ,Ethiopia, 2025 (n=642)

Variables	Category	Frequency	Percent (%)
Number of Pregnancy	<2	384	59.8
	>2	258	40.2
Live birth children	<2	405	63.1
	>2	237	36.9
Still birth or Perinatal death	No death	590	91.9
	1	45	7
	2	6	0.9
	>3	1	0.2
ANC follow up	Yes	642	100
	No	0	0
How many ANC visits did you attend during your last pregnancy	1 contact	4	0.6
	2 contact	23	3.6

	3 contact	72	11.2
	4 contact	152	23.7
	5 contact	134	20.9
	6 ontact	23	19.2
	7 contact	34	5.3
	8 and above contacts	100	15.6
At what gestational age did you have your first ANC visit	First trimester	313	48.8
	Second trimester	269	41.9
	Third trimester	53	8.3
	I don't Know	7	1.1
Place of ANC Follow up	Shaggar (Government hospitals and Healthcenters)	619	96.4
	AA (Government hospitals and Health centers)	26	4.05
	AA(Privatehospitalsandclinics)	16	2.46
	Shaggar (Private hospitals and clinics)	5	0.78
	Others	3	0.47
During your ANC visits were you told about birth preparedness	Yes	504	78.5
	No	138	21.5
Having history of facility delivery of last pregnancy	Yes	612	95.3
	No	30	4.7
Where did you deliver your child?	Shaggar (Government hospitals and Health centers)	425	66.2
	AA (Government hospitals and Health centers)	167	26
	AA (Private hospitals and clinics)	16	2.5
	Shaggar (Private hospitals and clinics)	4	0.6
Mother gave birth in Addis Ababa, What was the primary reason	Availability of skilled healthcare processionals	55	8.57
	Better medical care	86	13.4
	Recommendations from healthcare providers	24	3.74
	Family or societal pressure	18	2.8
	Fear of complications	37	5.76
	Referal linkage	86	13.4
	low cost	1	0.16
	Languagebarrier	6	0.93
	Others	5	0.78
Place of delivery at Home	Home	22	3.4
	Ontrip	2	0.3
	Others	6	0.9
Why did you prefer to deliver in home? (Multiple)	Health facility is toofar	6	0.93
	Feelmorecomfortablegivingbirth inhome	1	0.16
	Myusualpractice	1	0.16
	Unwilling approach of health provider	1	0.16
	Problemoftransport	9	1.4

	Normalpreviousdelivery	1	0.16
	Laborwasurgent	16	2.49
	Others(Specify)	11	1.71
Who assisted in the delivery?	Healthprofessional	612	95.3
	Familymembers	23	3.6
	Traditionalbirthattendant	5	0.8
	HealthExtensionWorker	1	0.2
	Others	1	0.2
How long was your labor persists?	>12 hours	146	22.7
	<12 hours	445	69.3
	I don't know	51	7.9

Accessibility and Availability of Health Facilities Related Factors

Over half of the respondents, 364 (56.7%), utilized public transportation, while only 142 mothers (22.1%) were used Ambulances.Out of the total, 412(64.2%)mothers, traveled less than 5 kilometers to access delivery services. Out of the total, 497(77.4%) mothers received medications and supplies at the facilities, while 123 mothers, accounting for 19.2%, did not receive them. Among the respondents, 577 individuals (89.9%) reported that the waiting areas were both clean and comfortable,while 587 individuals (91.4%) indicated that the compound was clean. A total of 573 mothers, accounting for 89.3%, were conducted in clean delivery and labor rooms, while 335(52.2%) were in clean and comfortable toilets. Out of the total, 371(57.8%) mothers had Adequate access to water in the delivery room (Table 3).

Table 3: Accessibility and Availability of Health Facilities related factors who gave birth in the last one year in Saggar city, Oromia, Ethiopia, 2025 (n=620)

Variables	Category	Frequency	Percent (%)
Type of transportation means you used to come to health facility	Public transportation	364	56.7
	Ambulance	142	22.1
	On foot	68	10.6
	Cart	2	0.3
	Others	44	6.9
Far from health facility (in km)	<5	412	64.2
	Jun-15	182	28.3
	16-25	21	3.3
	>26	5	0 .8
What were the main challenges you faced in accessing institutional delivery services	No Challenges	386	60.12
	Lack of transportation	143	22.27
	Distance to the nearest health facility	76	11.84
	Poor quality of care in healthcare facilities	70	10.9
	Fear of mistreatment in healthcare settings	61	9.5
	Cost of delivery services	23	3.58
	Cultural or traditional beliefs	2	0.31
	Others	8	1.25
Were there any transportation challenges that hindered your access to a health facility	No	525	81.8
	Yes	95	14.8
What would have encouraged you to deliver at a health facility	Lower cost of services	215	33.49

	Improved transportation services	79	12.31
	More accessible healthcare facilities	296	46.11
	Better quality of care	506	78.82
	Others	15	2.34
Are drugs and supplies you need available in facilities?	Yes	497	77.4
	No	123	19.2
Is waiting area clean and comfortable	Yes	577	89.9
	No	43	6.7
Is the compound of the facility clean	Yes	587	91.4
	No	33	5.1
Is delivery and labor room clean	Yes	573	89.3
	No	47	7.3
Is the toilet clean and comfortable to use	Yes	335	52.2
	No	285	44.4
Is water supply in delivery room adequate	Yes	371	57.8
	No	249	38.8

Quality of Care at Health Institutions Related Factors

The majority 565(88.0%) of mothers revealed that they were provided with a comfortable seat.Nearly 514 respondents, accounting for 80.1%, were polite during consultation, while 585 respondents, representing 91.1%, confirmed that their privacy and comfort were assured during the examination.Out of the total respondents, 476 individuals (74.1%) reported spending less than 15 minutes prior to receiving service.A total of 569 individuals, representing 88.6%, had the door closed for mothers during the consultation. Among the total respondents, 528 (82.2%) reported that the procedure was explained prior to the examination, while 501 (78.0%) indicated that it was explained before the diagnosis.

Most respondents, 556 (86.6%), reported that the quality of services related to institutional delivery was satisfactory among mothers who had given birth in the past year (Table 4).

Table 4: Quality of Care at Health Institutions related factors Mothers who gave birth in the last year in Saggar city, Oromia ,Ethiopia, 2025 (n=620)

Variables	Category	Frequency	Percent (%)
Were you provided with a seat to make you comfor table	Yes	565	88
	No	55	8.6
Time you spent before seen by health care provider In minutes	<15	476	74.1
	>15	144	22.4
Was the delivery care provider polite during consultation	Yes	514	80.1
	No	67	10.4
	Idon’t know	39	6.1
Was themeasures taken to assureprivacy, comfort during yourdelivery	Yes	585	91.1
	No	35	5.5
Did the delivery provider ask you about your concern	Yes	549	85.5
	No	71	11.1
Was there any interruption by the delivery provider when you speak about your concern	Yes	238	37.1
	No	382	59.5
Was the door closed during consultation	Yes	569	88.6
	No	51	7.9
Were the procedu resexplained for you before examination	Yes	528	82.2

	No	92	14.3
Wasthe diagnosis explained for you	Yes	501	78
	No	119	18.5
Quality care toward institutional delivery	Poor	86	13.4
	Good	556	86.6

Among the total respondents, 241 (37.5%) chose to deliver at home or in a healthcare facility with the support of their family, while 203 (31.6%) made the decision independently, and 184 (28.7%) relied on their friends for assistance. Majority of the respondents, 636 (99.1%), indicated that their choice of delivery location was not influenced by cultural beliefs or traditions. Out of all respondents, 451 individuals (70.2%) viewed home delivery as a potential threat, while 191 individuals (29.8%) did not share this perception (table 5).

Table 5: Socio-cultural related factors Mother who gave birth in the last year in Saggar city, Oromia, Ethiopia, 2025 (n=642)

Variables	Category	Frequency	Percent (%)
Whomade you to decide to deliver at home or in a health facility	Family	241	37.5
	MySelf	203	31.6
	Friends	184	28.7
	Your husband's	14	2.2
Any cultural beliefs or traditions in your community that affect the choice of where to deliver	No	636	99.1
	Yes	6	0.9
Are there community norms that prohibit delivery at health facilities	No	641	99.8
	Yes	1	0.2
Do you Perceived threats of home delivery	Yes	451	70.2
	No	191	29.8

Outcome Mother Knowledge with Institutional Skilled Delivery Service

In the study, 246 mothers (38.3%) demonstrated a good understanding of institutional delivery services, while 396 mothers (61.7%) exhibited poor knowledge regarding the utilization of these services, among those who had given birth in the past year.

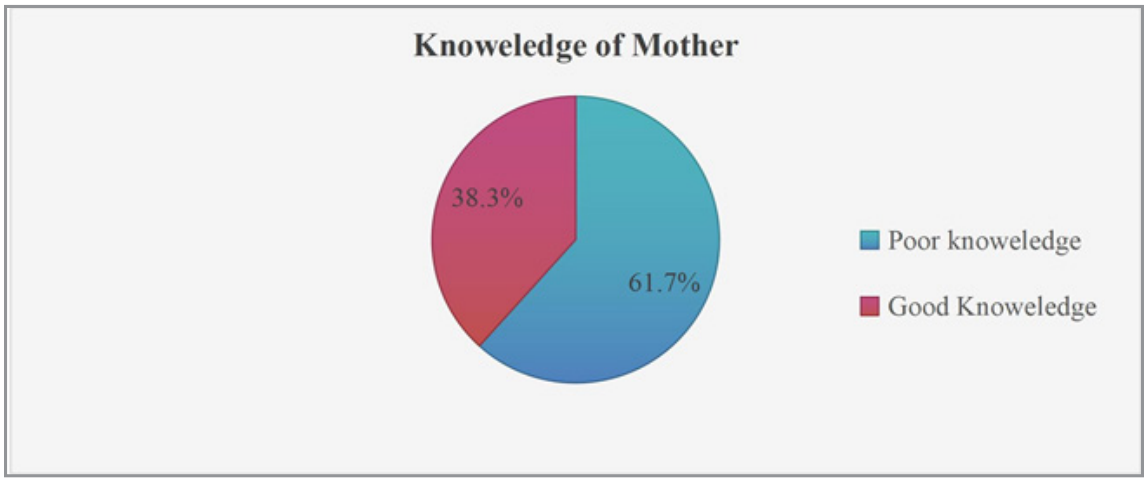

Figure 3: Shows Maternal Knowledge towards on institutional delivery service utilization who gave birth in the last one year in Saggar city, Oromia ,Ethiopia, 2025 (n=642)

Factors Associated to Maternal Utilization of Skilled Delivery Services in Health Institutions

A study utilizing Bivariable logistic regression analysis revealed that several factors were significantly associated with the utilization of institutional skilled delivery services among mothers. These factors include residency, maternal education level, monthly income, gestational age, distance from health facilities, cleanliness and comfort of toilet facilities, adequacy of water supply in the delivery room, politeness of the delivery care provider during consultations, measures taken to ensure privacy, explanation of procedures before examinations, and perceived threats associated with home delivery.The significance was determined at a p-value of less than 0.25.

The Hosmer and Lemeshow goodness of fit test yielded a p-value of 0.317, indicating a favorable fit for the model. In a multivariable logistic regression analysis, after accounting for the effects of various confounding factors, it was found that residency, maternal education level, monthly income, distance from health facilities, measures to ensure privacy, and the explanation of procedures prior to examination were all independent predictors of institutional delivery utilization among mothers, with p-values below 0.05.

Mothers Residing in Urban: Areas were 77% more likely to have their babies delivered in healthcare facilities compared to those living in rural areas (AOR=0.23; 95% CI: 0.09 - 0.58). Similarly, Mothers residing in peri-urban areas were 86% more likely to deliver their babies in health institutions compared to those living in rural areas (AOR=0.14; 95% CI: 0.05-0.38).

Mothers with a Diploma or Higher Education: Were 91% more likely to utilize institutional delivery services compared to those without formal education (AOR=0.09, 95% CI: 0.02 to 0.36).

Households with a monthly income >4001 birr were 71% more likely to use delivery services compared to those with a monthly income between 1001 and 2000 birr (OR 0.29, 95% CI = 0.11-0.83).

Mothers Living Distance: Within 5 kilometers of a health facility were seven times more likely to utilize institutional delivery services compared to those who had to travel between 6 and 15 kilometers (AOR=7.16; 95% CI: 0.6, 20-8.27). Likewise, respondents who needed to travel less than 5 kilometers to reach a health facility were three times more likely to use institutional delivery services than those facing 16 to 25 kilometers (AOR=3.30; 95% CI: 2.49-4.36).

Mothers who Had Measures in Place to Ensure Their Privacy: Were 86% more likely to use institutional delivery compared to those who did not have such privacy assurances, with an Adjusted Odds Ratio (AOR) of 0.14 and a 95% Confidence Interval (CI) of 0.01 to 1.40.

Mothers who Received an Explanation of the Procedures: Prior to the examination were 79% more likely to use institutional delivery compared to those who did not have the procedures explained before examination, with an Adjusted Odds Ratio (AOR) of 0.21 and a 95% Confidence Interval (CI) of 0.04 to 1.13 (Table 6).

Table 6: Bivariable and Multivariable Logistic regression output indicating factors associated with on the Assessment of institutional delivery utilization among mothers who gave birth in the last one year, Shaggar city, Oromia, Ethiopia,2025 (n=642)

Variables	Category	Institutional Delivery Utilization		COR(95%CI)	AOR(95%CI)	P- value
		No	Yes			
Residency	Peri-urban	11	99	2.46(1.43-4.24)*	0.23(0.09-0.58)**	0.002
	Rural	8	49	8.32(2.7-24.74)*	0.14(0.05-0.38)**	0.001
	Urban	11	464	1	1	
Mother Education Status	Cannot write & read only	8	46	0.24(0.03-1.89)*	0.09(0.02-0.36)**	0.001
	Canread&write	2	39	0.06 (0.01-0.39)*	0.31(0.05-2.03)	0.217
	Primaryschool(1-8)	14	236	0.77(0.09-0.35)	0.74(0.19-4.66)	0.75
	Secondary school (9-10)	3	140	0.64(0.05-0.73)	0.99(0.09-10.01)	0.994
	Preparatoryschool(11-12)	1	57	0.65(0.05-7.73)*	0.38(0.11-1.38)	0.142
	Diplomaandabove	2	94	1	1	
Monthly income	<1000	4	106	1.29(0.31-5.51)	0.98(0.28-3.47)	0.985
	1001-2000	10	74	0.32(0.09-1.09)*	0.29(0.11-0.83)**	0.022
	2001-3000	6	82	0.63(0.17-2.29)	0.62(0.20-1.93)	0.411
	3001-4000	1	53	1.64(0.17-15.77)	1.98(0.24-16.66)	0.528
	>4001	9	297	1	1	

At what gestationala-gedid you have your firstANCvisit	First trimester	11	302	1	1	
	Secondtrimester	12	257	1.95(0.44-8.57)	0.22(0.02-2.14)	0.135
	Thirdtrimester	6	47	0.68(0.03-15.61)	0.14(4.5-74.08)	0.384
	Idon'tKnow	1	6	3.55(0.82-15.34)*	0.23(0.03-2.12)	0.999
Far from health facility	<5	6	406			
	Jun-15	1	181	0.49(0.16-1.51)*	7.16(6.20-8.27)**	0.022
	16-25	0	21	18.4(1.51-22.26)	3.30(2.49-4.36)**	0.015
	>26	1	6	4.28(2.05-8.75)	3.9(3.96-3.97)	0.998
Is the toilet clean and comfortable touse	Yes	3	332	1	1	
	No	5	280	4.24(0.67-26.86)*	0.57(0.12-2.73)	0.49
Is water supply in delivery room adequate	Yes	5	366	1	1	
	No	3	246	0.16(0.02-1.82)*	1.18(0.26-5.29)	0.825
	Yes	7	507	1	1	
	No	1	105	1.94(0.65-5.76)*	0.59(0.06-6.04)	0.662
	Yes	7	578	1	1	
	No	1	34	3.82(0.63-23.1)*	0.14(0.01-1.40)**	0.009
	Yes	5	523	1	1	
	No	3	89	6.17(1.25-30.4)*	0.21(0.04-1.13)**	0.006
	Yes	19	432	1	1	
	No	11	180	2.93(1.13-7.65)*	0.69(0.15-3.04)	0.625

Notes:*Variables havinga (p≤0.25)in bi-variable analysis, ** statistically significant at (p≤0.05) in the multi-variable analysis

Discussion

This study aimed to assess factors affecting institutional delivery utilization among mothers who gave birth in the last One year in Shaggar city,Oromia Region, Ethiopia. In this study, the average age of the participants was 27.20 years, with a standard deviation of ±4.76 years. Among the total participants, 401 individuals, representing 62.5%, were aged between 25 and 34 years. The youngest participant was 15 years old, while the oldest was 45 years old. Most of the respondents,475 (74.0%) , resided in urban areas. Majority, 642 (100%) of mothers were antenatal care (ANC) follow-ups,with 619 (96.4) were antenatal care (ANC) follow-up at Shaggar city Government health facility. About 52(8.0%) had Still birth or perinatal death in the study period. During the study period, approximately 52 cases (8.0%) were reports as stillbirths or perinatal deaths.Approximately 100 mothers, representing 15.6%, attended eight antenatal care (ANC) contacts. Majority of the respondents 612 (95.3%) had previously given birth in a health facility, while the remaining 30 mothers (4.7%) delivered their last child at home or during on trip. Out of the total number of mothers, 425 (66.2%) delivered at the Shaggar city Government health facility, while the remaining 167(26.0%) and 16 (2.5%) gave birth at government and private health facilities in Addis Ababa, respectively.

A multi-variable logistic regression analysis conducted in this study indicated that several factors significantly influenced the utilization of institutional delivery services among mothers. These factors included the residential area, the educational status of the mother, monthly income, distance from health facilities, measures to ensure privacy, and providers explained procedures before to examination.

This study indicates that urban mothers are 77% more likely to deliver their babies in health institutions compared to their rural counterparts. Likewise, mothers residing in per-urban areas are 86% more likely than those in rural areas to have their babies delivered in health facilities.This study finding is consistent with the findings of the study in Ghana revealed that 82.4% of urban residents utilized health facilities for childbirth as against only 41.7% of rural areas, and the study in Bangladesh showed that participants from rural areas were 46.9% less likely to have institutional deliveries compared to urban [15, 16]. Another study conducted in in Sekela District, North West of Ethiopia, Mothers who lived in Urban areas were five times more likely to deliver in health facilities than those who live in Rural areas [17]. One possible explanation for this is that most rural women might be lack of infrastructure, distance, awareness and afraid of giving birth in urban health facilities unless they are referred to a higher-level public health facility. The reason for these findings might be due the fact that in urban areas the proportion of mothers with accessibility of the services with minimal distance and transport rather than rural mothers.

In this Finding, Mothers Educational: With Diploma and above were 91% more likely to use institutional delivery services than those who did not follow their formal education. Similar studies done in Munisa Woreda, South East Ethiopia,and Boset Woreda, Oromia Regional State, Women with higher level of education

(secondary and above) were about 4.3 and two times more likely to deliver at health facilities than those who were unable to read and write, respectively [18, 19]. This study is supported by Gilgelbelles town, Northwest Ethiopia [20]. Mothers without formal education may lack awareness of the benefits with institutional delivery. This could be attributed to the fact that educated women tend to have a greater understanding of the advantages of preventive healthcare and available health services. Additionally, they are often more open to new health-related information. The access to information and awareness regarding pregnancy complications that educated women possess likely enhances their likelihood of opting for institutional delivery. Educated women often possess knowledge gained through formal education, which can lead to positive behaviors regarding the utilization of maternal health services. This education also enables them to more easily challenge and overcome traditional and cultural practices associated with childbirth

Households with a Monthly Income: Exceeding 4001 birds were 71% more likely to use institutional delivery services compared to those earning between 1001 and 2000 birr. A comparable study in the Gonji Kollela District of the Amhara Region in Ethiopia found that mothers with a monthly income greater than $47 were approximately 5.4 times more likely to deliver at a health institution than those with a household income of less than $20 [21].Research conducted in Mahal Sayint Woreda, located in the South Wollo Zone, indicates that mothers with an income of 2,500 ETB or more are five times more likely to deliver in health facilities compared to those whose income ranges from 500 to 999 ETB. [22]. Similarly, a study in Arbaminch Town, Gamo Gofa Zone, SNNPR, Ethiopia, found that households with a monthly income of 200 birr are 73% less likely to utilize delivery services than those earning between 200 and 400 birrs monthly(14).Mothers' Monthly income of the house hold was strongly associated with the utilization of institutional delivery service.

This study revealed that mothers distance living within 5 kilometers of a health facility were seven times more likely to utilize institutional delivery services compared to those who lived between 6 and 15 kilometers away. This study aligns with the results of studies carried out in Eritrea, indicating that women living within a 2 km radius of a healthcare facility are 14 times more likely to give birth at a health facility compared to those who must travel more than 2 km to access the nearest healthcare services [23]. A study conducted in Ghana revealed that women residing more than 11 kilometers from a health facility were nearly twice as likely to use institutional delivery services compared to those living within 0-10 kilometers of such facilities [24]. Another Study conducted in the Delgi District of Northwest Ethiopia found that respondents who had to travel distances of 7 to 9 kilometers to access health facilities were 80% less likely to utilize institutional delivery services compared to those who needed to travel less than 3 kilometers.Similarly, respondents facing distances greater than 10 kilometers to reach a health facility were 83% less likely to use institutional delivery services than those with travel distances under 3 kilometers [25]. The average distance to a primary health care facility for rural communities in the Shaggar city study area ranges from 6 to 15 kilometers. This distance significantly influences the choice of delivery location, as transportation to health facilities is often either unavailable. Distance can be assessed through various factors, including geographical distance, mode of transportation, travel time, and associated costs. For example, a few respondents indicated that they used ambulances to reach health facilities. However, the majority relied on personal transportation methods, many of which, such as Bajaji, private cars, and public transport, are not suitable for transporting a pregnant woman in labor. Consequently, women and their families are likely to make informed decisions regarding the utilization of delivery services, considering factors such as the mode of travel, travel duration, transportation costs, and the challenges of securing an appropriate means of transport.

This study showed that mothers whose measures were taken to assured privacy were 86% more likely to use institutional delivery than those who were not assure their privacy. This aligns with research conducted in public hospitals in Eastern Ethiopia, including Nekemte Specialized Hospital and Ambo Town, as well as a similar study carried out in Nigeria [26-29].The increased likelihood of institutional delivery may be attributed to the discomfort experienced by women when privacy is not upheld during physical examinations, which can result in lower satisfaction with healthcare services.

In this study respondents who reported that whose providers explained procedures before examination were 79% more likely to use institutional delivery as compared to those of their counterparts. This finding aligns with a study conducted in West Shewa, Ethiopia, which indicated that mothers who received explanations about the processes and what to anticipate during labor and delivery were 1.5 times more likely to utilize institutional delivery services than those who did not receive such explanations [30]. Additionally, a study at Adama Hospital Medical College in Ethiopia found that when providers communicated the procedures to mothers, they were three times more likely to choose institutional delivery services compared to those who were not informed about the procedures. This finding also highlighted the importance of engaging mothers in all aspects of care provided by health facilities, leading to increased satisfaction with institutional delivery services.

Strengths and Limitations of the Study

Strength of the Study

- The response rate in this study was 100%. This study can provide valuable information that can serve as a guide for future interventions.
- The investigator aimed to minimize biases during interviews carried out by non-staff individuals in the selected Sub-city, while the mothers were preparing at home.
- The study encompasses urban, peri-urban, and rural areas to enhance its generalizability.

Limitation of the Study

- The constraints of this study are attributed to its cross-sectional study design, which does not allow for the demonstration of a cause-and-effect relationship.
- Mothers were interviewed at a healthcare facility, which may lead them to provide responses that favor the care providers, thereby introducing social desirability bias.
- The Quality care ratings of mothers were collected through face-to-face interview,which may be influenced by response biases.

Conclusions and Recommendations

Conclusion

The overall utilization of institutional delivery services at government health facilities for mothers who gave birth in the past year in Shaggar City was low in comparison to the coverage of antenatal care (ANC) follow-up at Health institutions. The Mother education Status,Monthly income,Far from health facility, measures to assure privacy,and providers explained procedures before examination were some of the factors significantly associated mothers gave birth with institutional delivery services utilization.

Recommendation

Considering the study's findings, the following recommendations are proposed to enhance the utilization of institutional delivery services at government health facilities in Shaggar City. These suggestions are directed towards relevant organizations and stakeholders, particularly those involved in maternal health, child health, and reproductive health:

To Saggar City Health Office

- Strength existing strategies involving the provision of information, education, and communication, targeting women, family, and the general community to increase their awareness about institutional childbirth and its influencing factors.
- There should be sustainable provision of medical equipment and drugs that help improve the quality of delivery care provided.
- Enhance the technical competencies of healthcare providers by implementing in-service training programs.
- There is a requirement for infrastructure enhancement, such as the addition of rooms, to ensure privacy and create a comfortable waiting area.
- Enhance the utilization and management of ambulances.
- Supportive supervision systems need to be strengthened to ensure the effective implementation of the recommended delivery components.

To Sub-cities and Health Facilities

- Improve the waiting area with comfortable seats in health facilities.
- Enhance the accessibility of medications and essential supply and diagnostic services required for maternal and newborn care, while monitoring the health facility, and ensure sustainable availability of drugs and supplies.
- To ensure the privacy of all clients, it is essential to close the door and obtain consent if individuals other than the provider are present during the consultation.
- Improve the cleanliness of toilets in health facilities.
- Health care providers should be a more friendly and welcoming approach towards women and their families by demonstrating professional competence, showing respect, and safeguarding the privacy of women throughout the antenatal, childbirth, and postnatal Periods
- Enhance counseling services by offering information on birth preparedness, the risks associated with home births, and antenatal care (ANC) attend eight contacts appointments at health facilities, and communicate the expected date of delivery (EDD) at the appropriate times.

Establishing health care facilities within a convenient distance from residences, ensure the ongoing availability of ambulance services, and deploy trained health workers within the community.

Health extension workers Should to enhance the community-based support group, known as the Women Development Army, to develop solidarity and fully utilize their capabilities. This will enable them to consistently conduct behavioral change communication sessions with women, their husbands, and the general community, ensuring that all parties possess a strong understanding and positive attitudes towards institutional childbirth.

Finally, in the future, the investigator recommend research using qualitative methods to examine the quality of care in the utilization of institutional skilled delivery services within health institutions.

Abbreviations and Acronyms

ANC: Antenatal Care,BEmONC:Basic Emergency Obstetric and Neonatal Care,CI:Confidence interval,EDHS:Ethiopian Demographic Health Survey,L & D:Labor and Delivery:MWH:Maternity Waiting Home,MMR: Maternal Mortality Ratio,NGO:Non-governmental Organization.PMTCT: Provider Mothers to Child Transmission,PNC: Postnatal Care:SDG:Sustainable Development Goals, SBA:SkilledBirth Attendants,SPSS: Statistical Package for Social Science,UNICEF: United Nation International Child Emergency Fund and WHO: World Health organization Health Organization.

Declaration

Author's Contributions

GM, AB, and AK conceptualized, designed the study, analyzed, interpreted the data, drafted the manuscript, and critically reviewed the manuscript. All the authors read and approved the manuscript.

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Conflict of Interest

The authors declare that they have no conflicts of interest for this work.

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