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Indications, Maternal and Fetal Outcomes of Caesarean Section Among Women Delivered at Upgraded Health Centres in Temeke Municipality

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Abstract

Background: *Caesarean section (CS) is a critical surgical procedure that can save lives, but its access varies significantly between geographical locations, leading to disparities in maternal outcomes. In Tanzania, one strategy to address this has been the upgrade of selected health centres to provide Comprehensive Emergency Obstetric and Neonatal Care (CEmONC), aiming to improve the availability and quality of life-saving procedures, including CS. However, detailed information on the extent to which CS is performed, its indications, and outcomes in these upgraded health centres remains scarce. This study provides essential data on these parameters, aiming to inform policy and guide the optimization of obstetric care standards by addressing critical knowledge gaps related to caesarean section practice.*

The Study Aimed*: To determine the proportion, indications, and immediate outcomes of caesarean sections at the upgraded health centres in Temeke Municipality.*

Methods: *A descriptive cross-sectional study analysed 432 medical files of women who gave birth at Maji Matitu, Yombo Vituka, and Mbagala Round Table upgraded health centres in Temeke Municipality from 1st January 2021 to 31st December 2022. A structured checklist was used to extract information regarding indications and fetal-maternal outcomes of CS from medical records. The data were analysed using descriptive statistics in the Statistical Package for the Social Sciences (SPSS), version 23.0, to summarize the proportions, indications, and immediate outcomes associated with caesarean delivery.*

Results: *The mean age of the pregnant women was 26 (SD±5.6) with majority (92%) falling between 18 to 35 years with 79% of being para 1 to 3. Regarding antenatal care, 76% of women made 4 to 8 visits and 43% were anaemic at the time to the CS. Most new-born (87%) were delivered at term. The overall proportion of CS at the upgraded health centres was 21%. The primary indications CS included fetal distress (23%), Robson Group 1 (47%), previous CS scar (19.8%), and cephalopelvic disproportion (11%). Almost all women*

had live birth and 98% stayed in the facility for 3 days post-operation. However, 5.4% of the new-borns were refereed for Neonatal Intensive Care Unit (NICU) admission.

Conclusion: *This study reveals a high CS rate in upgraded health centres, primarily due to fetal distress, previous CS scar, and cephalopelvic disproportion. Most CS procedures were on low-risk women, while maternal and fetal outcomes were generally good, further research is needed to address these high rates in low-risk women and improve neonatal care.*

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List of Abbreviations

ACOG	American College of Obstetric Gynaecologist
APH	Antepartum Haemorrhage
CEmOC	Comprehensive Emergency Obstetric Care
CPD	Cephalopelvic Disproportion.
CS	Caesarean Section
ECS	Emergency Caesarean Section
ICU	Intensive Care Unit
IRB	Institutional Review Board
MUHAS	Muhimbili University of Health and Allied Sciences
PCS	Planned Caesarean Section
RDS	Respiratory Distress Syndrome
SBF	Spontaneous birth fresh
SBM	Spontaneous birth macerated
SPSS	Statistical Package for Social Sciences
TOLAC	Trial Of Labour After Caesarean
TTN	Transient Tachypnoea of the Newborn
VE	Vacuum Extraction
WHO	World Health Organization

Background

Caesarean section (CS) is a surgical procedure to deliver the fetus and placenta through incisions on the abdomen and uterus [1]. It can be classified as an emergency, performed due to an immediate maternal or fetal need, or as an elective, planned procedure [2]. While CS is a life-saving procedure, unnecessary use can risk maternal and perinatal health [3]. The global incidence of CS has risen significantly from 12% in 2000 to 21% in 2015, and is projected to reach 29% by 2030 [4]. The rising global rates are influenced by various factors, including sociocultural pressures and healthcare provider preferences, with some providers viewing it as a more convenient option [5]. This trend is not uniform, revealing vast geographical disparities globally. Northern Africa (44.9%) and Eastern Asia (34.7%) show high prevalence, with Eastern Asia projected to reach 63.4% by 2030 [6]. In contrast,

sub-Saharan Africa has the lowest rates, with only 3.6% over the past decades and a projected to reach 7.1% by 2030 [6]. Some countries, like Chad and Niger, report rates as low as 1.4%. In Tanzania, CS increased by 5% from 2015 to 2016, highlighting the need for improved maternal healthcare and safe surgical procedures, particularly in under-resourced areas [7,8].

The World Health Organization (WHO) proposed Robson's 10-group classification system for assessing and comparing CS rates across healthcare facilities. This system categorizes all hospital deliveries into one of ten groups based on objective, routinely collected variables that influence mode of delivery such as parity, gestational age, and fetal presentation [9,10]. Applying the Robson classification in health facilities allows healthcare providers to identify which specific patient groups contribute most to the CS rate, facilitating targeted interventions to reduce unnecessary procedures.

With rising CS rates globally, understanding the common medical indications is crucial for improving maternal and fetal outcomes. Common medical indications for CS include labor dystocia, fetal distress, fetal malpresentation, multiple gestations, and suspected macrosomia [11-15]. Other frequent causes are previous CS scar, prolonged labour, antepartum haemorrhage (APH), cephalopelvic disproportion (CPD), and failed induction [2,11-15]. Additionally, non-medical factors such as maternal requests, driven by fear of childbirth and concerns over labor pain, also contribute to rising CS rates (20,33). Given these trends, it is vital to ensure CS are performed only when medically necessary.

In sub-Saharan Africa countries, such as Tanzania there is 81% of rural–urban disparities of caesarean deliveries, attributed to differences in maternal and child characteristics, with CS utilization consistently higher in urban than rural areas [16]. To address these challenges, Tanzania upgraded health centers to provide comprehensive obstetric and surgical care which is critical for improving access to services and reducing congestion at higher-level referral facilities [3]. In Temeke Regional Referral Hospital (TRRH), there is a significant increase of women undergoing CS from 6,429 to 7,578 from 2017 to 2019 and 2020 to 2022 year respectively. Despite this increase in service provision, serious complications, such as PPH, caesarean hysterectomy and anaesthetic complications, organ injury such as ureteric, bowel or bladder injuries that can lead to fistula formation, remain a significant concern [17]. There is paucity of detailed information on the proportion, specific indications, and outcomes of CS in these newly upgraded centres. This study therefore seeks to fill this knowledge gap by assessing the proportion of CS, its clinical indications, and the subsequent maternal and neonatal outcomes. The findings will help evaluate whether the health system upgrades have effectively improved obstetric care or introduced new challenges in CS practice within Temeke Municipality.

Methods

Study Design, Sites and Settings

The proposed study was a hospital-based descriptive cross-sectional study, conducted in Temeke District. This district covered 240 square kilometres of a Dar es Salaam, region, and home to a population of 1,629,043 people, with 794,000 males and 834,943 females [18]. Temeke has two divisions, Chang'ombe and Mbagala, and is composed of 23 wards and 140 sub-wards. It contains 126 health facilities, including one regional referral hospital and four government-owned health centres. The district was chosen for this study due to its high referral rates to Muhimbili National Hospital, particularly from Mbagala hospital, which had 155 referrals between January and April 2022. Unpublished records from Temeke Regional Referral Hospital (TRRH) indicate a drop in the number of deliveries at the facility from 13,502 in 2017 to 5,671 in 2020, following the upgrade of nearby health centres, suggesting a shift in delivery services to these facilities.

The upgraded health centres included in this study were, Maji Matitu, Mbagala Roundtable, and Yombo Vituka, all of which were renovated to provide CEmOC services. These centres were equipped with essential maternity and surgical facilities, trained personnel, and resources to manage CS and maternal health outcomes. From 2021 to 2022, Maji Matitu Health Centre reported 2098 CS out of 8,070 deliveries, Yombo Vituka Health Centre had 1731 CS out of 8,735 deliveries, and Mbagala Roundtable Health Centre had 1273 CS out of 7,491 deliveries. These upgrades have contributed significantly to the increase in delivery services and

CS rates in the district. Buza Health Center, though upgraded, was excluded from the study due to its recent operational status, limiting availability of data.

Study Population

The study included all women who delivered (regardless of mode of delivery) at the upgraded health centres in Temeke Municipality.

Sample Size, Sampling Technique and Procedures

The sample size for this quantitative study was calculated using a proportionate formula designed for a finite population. The target population consisted of 24,296 women who delivered at the upgraded health centres in Temeke Municipality from January 1st, 2021, to December 31st, 2022. With a 5% margin of error, the minimum sample size was determined to be 397. After adjusting for a 10% non-response rate, the final sample size was calculated to be 432 women. The total number of women who delivered at these centres was used as the sampling frame for selecting participants.

A proportionate sample was allocated to each health centre based on the number of women who delivered there. Using a random sampling technique, 143 participants were selected from Maji Matitu, 133 from Mbagala Roundtable, and 156 from Yombo Vituka. A comprehensive list of all women who delivered in each centre was developed from the delivery book, and Microsoft Excel's random number generator was applied to ensure random selection. The sample of 432 women was proportionally distributed as outlined in Table 1 below.

Table 1: Proportional Distribution of the Sample for each Included Health Centre

The Upgraded health centre	Number of women who delivered	Proportion of delivered women	Required sample size (n)
Maji Matitu Health center,	8070	432*0.33	143
Mbagala Roundtable Health Center	7491	432*0.31	133
Yombo Vituka Health Centre	8735	432*0.36	156
TOTAL	24296		432

Data Collection Tools and Procedures

A structured checklist with closed-ended questions was adopted and modified from various studies and literature to fit the study objectives [19-21]. The checklist was divided into four key sections: socio-demographic characteristics, mode of delivery, indications for CS, as well as maternal and fetal outcomes. Variables included the mode of delivery (vaginal or CS, with specific details regarding hospital stay duration, a list of complications following CS, and classification of CSs based on Robson's 10 groups. Fetal outcomes were also scrutinized, such as whether the birth was live or stillborn, including distinctions between fresh or macerated stillbirths, APGAR scores at 5 minutes, birth weight, and admissions to Neonatal Intensive Care Unit (NICU). Research assistants meticulously reviewed patient files, supplemented missing information using theatre procedure or MTUA books when necessary, ensuring data completeness.

Data collection was conducted simultaneously across all upgraded health centres in Temeke Municipality, utilizing a structured the checklist. Patient files that lacked essential information, such as indications for CS, fetal outcomes (including APGAR score and birth weight), or maternal postoperative notes, were not included in the analysis. Instead, such records were replaced by the next complete and eligible file on the sampling list. To ensure data accuracy, two research assistants reviewed patient's files and verified adherence to the study's

inclusion criteria. This systematic and thorough approach reduced the risk of missing data, ensuring consistency in data collection, which aided in a reliable analysis and interpretation of the findings.

Data Analysis

Data were entered, coded by research assistants, and cleaned by the researcher in the IBM Statistical Package for Social Sciences (SPSS) version 23, which was used for data entry and analysis. The SPSS data files were stored on a computer with password accessed only by the researchers, and filled questionnaires were locked into a file cabinet accessed exclusively by the researchers. Continuous variables (e.g., age, birth weight) were summarized using the mean and standard deviation. Categorical variables from demographic data were summarized and presented using simple frequency tables and proportions. This process allowed for the analysis of key outcomes, such as the proportion of CS, indications, and maternal and neonatal health outcomes. Descriptive statistics were used to examine variables including maternal age, education, gravidity, gestational age, chronic illnesses, mode and type of CS delivery. Also, immediate maternal outcome (postpartum haemorrhage, anemia, delayed mobilization and hospital stay) and fetal complications (fetal distress, low Apgar score, and NICU admission). The findings provide insight into the factors influencing CS deliveries and their associated outcomes in this setting.

Ethical Consideration

The study was granted an approval letter with Ref No. DA 282/298/01.C/1839 from the Muhimbili University of Health and Allied Sciences' Institutional Review Board (IRB). Before commencing the data-gathering process, consent for this study to be carried out had to be obtained from Temeke Municipal and the administrative office of the upgraded health centres. Additionally, patient consent to access health information was waived by the medical records committees of Temeke Hospital (Appendix Two). To protect confidentiality and anonymity, no names of the patients were included on the checklist or data set in SPSS; instead, codes were utilized.

Results

Sociodemographic and Obstetric Characteristic of Pregnant Women at Upgraded Health Centres (N=432)

The mean age of pregnant women was 26.0 (Standard deviation ±5.6), and 45.4% of the women were aged between 18 to 24 years. More than half, 62.3% of pregnant women came from within their respective wards in Temeke. In obstetric history, 79% of pregnant women were multigravidas, 59.7% were between 1 and 3 parity and 87% of the new-borns were delivered at term. However, most (96.5%) of pregnant women did not have chronic illnesses, 57.2% had a normal recorded haemoglobin level, 98.4% were above 150cm in height, and 75.5% had made 4 to 8 visits for antenatal care (ANC). Table 2

Table 2: Sociodemographic and Obstetric Characteristics of Pregnant Women at Upgraded Health Centres. (N=432)

Variable	Frequency (n)	Percentage (%)
Age group (years)		
15-24	196	45.4
25-34	194	44.9
35-44	42	9.7
Residence		
Within the ward	269	62.3
Outside the ward	163	37.7

Gravidity		
1	149	34.5
2	130	30.1
3	79	18.3
≥ 4	74	17.1
Parity		
0	161	37.3
1-3	258	59.7
≥ 4	13	3
Gestational age		
Preterm	34	7.9
Term	376	87
Postdate	22	5.1
Chronic illness		
None	417	96.5
Asthma	1	0.2
HIV	13	3
Hepatitis	1	0.2
Haemoglobin		
Moderate anaemia	64	14.8
Mild anaemia	121	28
Normal	247	57.2
Height		
Above 150cm	425	98.4
Below 150cm	7	1.6
ANC visit		
1-3 visit	106	24.5
4-8 visit	326	75.5

Proportion of Pregnant Women Delivered by Caesarean Section at Upgraded Health Centres

The proportion of pregnant women delivered by CS from selected upgraded health centres in Temeke Municipality was (91) 21.1%. Specifically, women who delivered by CS were 36 (25.5%) from Majimatitu Health centre, 32 (20.5%) from Yombo Vituka Health centre, and 23(17.3%) from Mbagala health centre. Among these, elective CS accounted for 20.9%, while 79.1% were emergency CS.

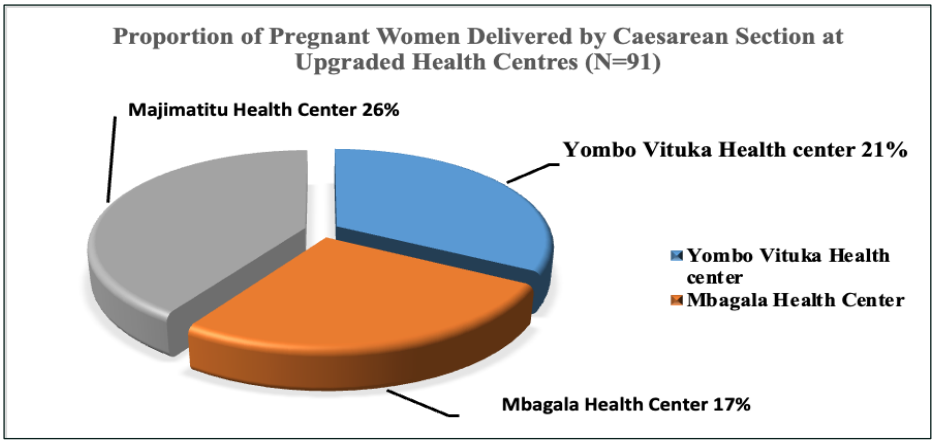

Figure 1: Proportion of pregnant women delivered by caesarean section at upgraded health centres (N=91)

Indications for Caesarean Section among Women Delivered at Upgraded Health Centres (N=91).

Out of the 91 pregnant women delivered by CS, the most common indication was fetal distress 23.1%, followed by a history of previous CS scar (19.8%) and cephalic disproportion (11%).

Table 3: Indications for Caesarean Section Among Women Delivered at Upgraded Health Centres (N=91).

Variables	Frequency (n)	Percentage (%)
Fetal distress	21	23.10%
Previous caesarean section	17	18.70%
Cephalopelvic disproportion	10	11.00%
Obstructed labour	8	8.80%
Big baby	7	7.70%
Cervical dystocia	4	4.40%
Prolong labour	3	3.30%
Post date	3	3.30%
Cord presentation/prolapse	3	3.30%
Transverse lie/ malpresentation	2	2.20%
Non-progress of labour	2	2.20%
Failed induction	2	2.20%
Breech	4	4.40%
Previous myomectomy scar	1	1.10%
Preeclampsia, eclampsia	1	1.10%
Placenta calcification	1	1.10%
Oligohydramnios	1	1.10%
Antepartum haemorrhage	1	1.10%

Distribution of Caesarean Indication by Robson Group

Among the 91 pregnant women who underwent CS, 47.3% were Group 1, (nulliparous women with single cephalic pregnancy at term in spontaneous labour), according to Robison classification. This was followed by Group 2 (Multiparous women with single cephalic at term in spontaneous labour without CS) at 19.8%, and Group 3 (Multiparous with a single cephalic pregnancy at term with at least one previous CS) at 18.7%.

Table 4: Distribution of Caesarean Indication by Robson Group (N=91).

Variables	Frequency	Percentage
Nulliparous, single cephalic, >37 weeks in spontaneous labour	43	47.30%
Multiparous, single cephalic,>37week (exclude SC) in spontaneous labour	18	19.80%
Multiparous, single cephalic, >37week, previous CS	17	18.70%
Multiparous, single cephalic,>37week induced labour CS before labour	4	4.40%
All nulliparous breech	3	3.30%
All multiple pregnancies (including previous CS)	2	2.20%
Nulliparous, single cephalic, >37week induced (include prelabour SC)	1	1.10%
All multiparous breech (including previous CS)	1	1.10%
All transverse or oblique lies (including previous CS)	2	2.20%

Immediate Maternal Outcomes of Caesarean Section Among Women Delivered at Upgraded Health Centres

Almost 98% of mothers who underwent CS at upgraded health centres stayed in the facility for three days,

1.0% had a postpartum haemorrhage, and 1.0% had a hospital stay of more than three days.

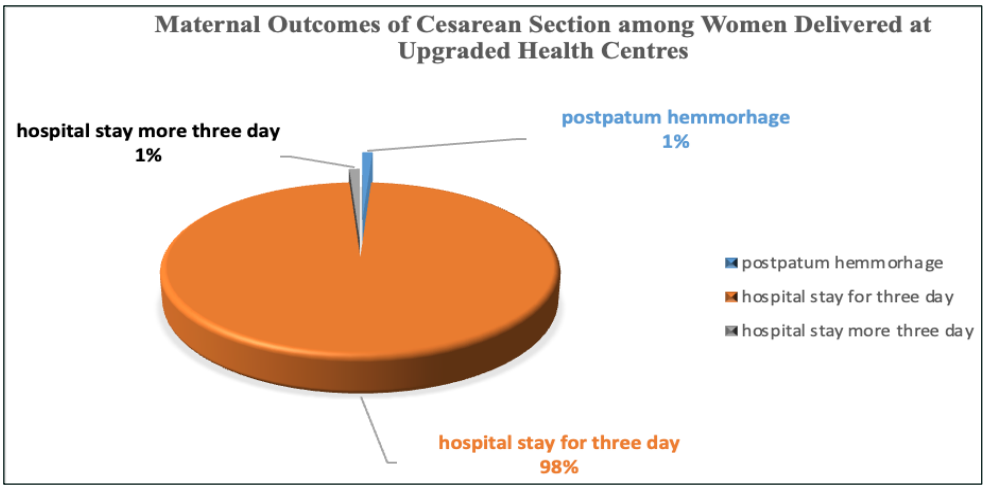

Figure 2: Immediate Maternal Outcomes of Caesarean Section Among Women Delivered at Upgraded Health Centres

Fetal Outcomes of Caesarean Section Among Women Delivered at Upgraded Health Centres

The birth outcome was one of the variables used during the data collection at upgraded health centres. Consequently, among the pregnant women who had a CS delivery, 98.9% of their babies were alive, 95.7% were singleton fetuses and 5.5% had a low birth weight below 2.5 kilograms 23.1% had higher birth weight of 3.6 kilograms and above. Moreover, 96.8% of the fetuses had higher APGA scores above 7 in the five minutes and 5.4% of them were referred for NICU admission.

Table 5: Fetal Outcomes of Caesarean Section Among Women Delivered at Upgraded Health Centres

Variable	Frequency	Percentage
Fetal outcome		
Live birth	92	98.90%
Stillbirth fresh	1	1.10%
Number of neonates		
Single	89	95.70%
Twin	2	4.30%
Baby weight (kilogram)		
Below 2.5	5	5.50%
2.5-3.9	79	86.80%
4 and above	7	7.70%
APGA score at 5min		
≥ 7	90	96.80%
< 7	3	3.20%
Referred for NICU admission		
Yes	5	5.40%
No	88	94.60%

Discussions

This study conducted a retrospective review of medical records from pregnant women who delivered at upgraded health centres in Temeke Municipality. The majority of women were aged 18 to 35 years and were multigravidas with parity ranging from one to three. The overall caesarean section (CS) rate was 21%, notably higher than the national average of 12% reported in public health facilities across Tanzania [22]. This elevated rate suggests

potential overutilization of surgical delivery, which, in the absence of clear medical indication, may expose mothers and newborns to unnecessary procedural risks. Adherence to standardized clinical guidelines is therefore essential to ensure CS is performed only when medically justified.

When compared to other settings, the observed CS rate is lower than the 35.2% documented at Tosamaganga Hospital in Iringa, Tanzania [23], reflecting substantial subnational variation. Such disparities are likely influenced by differences in referral pathways, patient clinical profiles, and care-seeking behaviours. Evidence from northern Tanzania, for instance, demonstrates that women formally referred to hospitals had significantly higher CS rates (55.0%) than those presenting spontaneously (26.9%) [24]. International studies, including those from India, further illustrate how contextual factors including provider practices, cultural norms, socioeconomic conditions, and institutional policies, contribute to geographic variations in CS utilisation [25]. Collectively, these findings underscore the multifactorial determinants of caesarean delivery and highlight the need for context-sensitive strategies. For health systems to align with WHO recommendations on medically necessary CS, policymakers and clinicians must systematically identify and address the drivers of inappropriate variation to optimize maternal and perinatal outcomes.

Our study also revealed fetal distress was the leading indication for CS which emphasized the need to prioritize fetal well-being monitoring during labour among women delivered at the upgraded health centers in Temeke Municipality. Fetal distress, indicated by abnormal heart rate patterns or low oxygen levels, requires timely intervention to prevent negative outcomes [26]. Moreover, the finding of this study was also similar to a study conducted at Iringa Regional Referral Hospital, Tanzania, which reported the same common indication (32.0%) among women delivered by CS [27]. Findings aligned with a systematic review of multiple studies conducted in South Asian countries that reported fetal distress to be the common medical indication for CS [11]. This highlights the importance of proper fetal monitoring and quick responses in obstetric care. Upgraded Health centers need to be allocated resources for closer monitoring and diagnostic capabilities for detecting fetal distress at any stage. Improving the standard of intrapartum monitoring, and the quality of diagnosis is crucial for closer monitoring of fetal distress.

In low-resource settings like Temeke, diagnosing fetal distress presents challenges primarily due to limitations in interpreting fetal monitoring data accurately and making timely decisions. These challenges are compounded by the controversies surrounding the definition and assessment of fetal distress. Factors such as variations in diagnostic criteria or access to monitoring technology may also affect the frequency of fetal distress diagnoses [26-29]. Clinicians often rely on clinical signs such as abnormal fetal heart rate patterns, meconium-stained amniotic fluid, and non-reassuring fetal status during labour. Interpretation of these signs can vary based on individual clinician experience and available resources for continuous fetal monitoring [30]. Therefore, the finding suggested that while clinicians in Temeke rely on available clinical signs to diagnose and manage fetal distress, the absence of standardized, consistently applied protocols combined with limited monitoring resources contributes to variability in decision-making and may affect the quality and timeliness of intrapartum care.

The findings of our study highlighted a higher rate of CS among lower-risk patients in Robson group 1, which comprises nulliparous women with a single cephalic pregnancy at term in spontaneous labour. This was consistent with a study conducted in Nepal, whereby 66.1% of women who belonged to Robson's Group One had CS [31]. Moreover, the CS delivery of women in Robson Group 1 was indicated as the main factor that raised CS from 19% to 49% in Tanzania (4). These findings suggest that avoidable factors such as poor intrapartum monitoring, limited staffing, and providers' fear of blame may be driving the rising use of caesarean section even among low-risk women in Robson Group 1.The findings of this study differ from the study done in Germany, where 65.1% of CS was highly contributed to Robson group 5 [32]. Similarly, a global survey conducted by WHO on maternal and fetal health reports, 82.3% of nulliparous women with a single, cephalic term pregnancy had a vaginal delivery [33]. The discrepancy among different study's findings raises important questions on understanding, clinical decision-making behind CS and on overreliance of surgical interventions when less invasive options may be suitable. Such practices could lead to unnecessary surgical risks and complications for mothers and infants,

highlighting the need for adherence to clinical and evidence-based guidelines in obstetric care [26,34]. This points to the need to examine the factors contributing to high CS rates in this group, including provider attitudes, institutional practices, and patient preferences, to better understand the dynamics and inform interventions that reduce unnecessary surgical interventions while ensuring maternal and neonatal safety.

Additionally, our data shows that most women delivered by CS had a hospital stay of three days. This short length of stay may reflect efficient recovery protocols, but it could also indicate early discharge practices that prioritizes providing space for other patients over comprehensive recovery assessments [35]. The finding of the study was inconsistent with a comparative study conducted in India which reported length of hospital stay was 8.6 days for women delivered by CS [36]. One possible reason for this variation could be due to differences in clinical protocol, healthcare system, postoperative care programs, and healthcare resources. Therefore, understanding the reasons for this duration is crucial, as a shorter hospital stay may increase the risk of missed postoperative complications, including delayed sepsis and secondary postpartum hemorrhage, ultimately affecting both maternal and neonatal outcomes and post-discharge support.

This study found that nearly all women who underwent CS delivered a live, singleton newborn. This high rate of positive neonatal outcomes underscores the procedure`s effectiveness in safeguarding infant health when performed for appropriate indications. These findings are consistent with a study from a tertiary teaching hospital in Addis Ababa, Ethiopia, which similarly reported that 94.5% of CS resulted in live births and 95.8% involved singleton fetuses [37]. Collectively, this evidence emphasizes that timely and necessary CS in upgraded facilities are a critical component of effective maternal and neonatal healthcare.

Despite the overall success in maternal and neonatal outcomes, this study also documented adverse events, including one case of stillbirth. This outcome underscores the need of managing obstetric emergencies, even within upgraded facilities. In low-resource settings, fetal loss during CS is often associated with critical emergencies where delays or limitations in timely and effective intervention can impact survival [26]. Such cases highlight the critical need for continuous readiness, advanced surgical skills, and robust interdisciplinary collaboration to manage complex obstetric situations effectively.

The findings showed a relatively higher proportion of both low and high birth weight compared to those reported among primigravida women in a study conducted in the Iringa region, Tanzania [38]. One possible explanation for these differences is the variation in socioeconomic conditions, which can influence maternal nutritional status and access to quality prenatal care [39,40].

This study revealed higher proportion of new-borns with five-minutes APGAR score of 7 or above which is consistent with 91.0% found in Rwanda but contrasts with a lower rate of 34.1% in Brazil [41,42]. A high APGAR score generally reflects successful initial adaptation to extra-uterine life, it is important to note that this metric does not detect underlying conditions such as congenital malformations, prematurity, neonatal infections, or respiratory distress [43-45].

Finding of the study show there is considerable NICU admissions following delivery which is higher than the 3.7% reported in a study from Eritrea [21]. Furthermore, the finding is supported by research from Vashi et al (2023), which identified meconium-stained amniotic fluid, a sign of possible fetal distress, as a leading cause for NICU admission, accounting for 29.6% of cases for complication monitoring [46]. In contrast, studies from Ethiopia and Eritrea reported that the majority of neonates delivered by CS did not require NICU care [21,47].

The finding of this study found stillbirths accounted for 1.1% of pregnancies, underscoring the poor outcome where the fetus does not survive until delivery. Each instance of stillbirth necessitates a thorough investigation into potential causes like placental insufficiency or congenital abnormalities [48]. This finding emphasized the understanding of circumstances which may enhance prenatal screening, improve maternal health monitoring, and implement timely interventions to reduce future occurrences [49,50].

Limitations of the Study

During the stage of data collection and analysis, a key limitation was incomplete medical records, specifically the lack of consistent data on maternal co-morbid diagnoses and their severity. We sought to minimize this limitation by implementing a rigorous, systematic review of all records and working directly with clinical staff to clarify and document any missing variables.

Conclusion and Recommendations

This study demonstrates that while upgraded health centres in Temeke Municipality are achieving high rates of live births and generally favourable neonatal outcomes, the caesarean section rate of 21% exceeds national levels and suggests overutilisation among low-risk women. Fetal distress remains the predominant indication for CS, yet diagnostic accuracy is compromised by limited monitoring resources and the absence of standardised protocols. Maternal outcomes, such as hospital stays, postpartum haemorrhage, and birth weight, highlight the need for a more in-depth evaluation or audit of CS practices and suggest that tailored interventions could improve care at the upgraded health centres. Further studies should explore the factors contributing to this trend in upgraded health centres to inform targeted interventions.

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