

# Prevalence and Risk Factors of Obstructed Labor Among Pregnant Women at Selected Public Hospitals in Mogadishu- Somalia: Multi-Centered Case-Control Study

Mohamed Gedi Sheikhow<sup>1, \*</sup>, Abdisamad Sheikh Yusuf<sup>1</sup>, Abdirahman Mohamed Ahmed<sup>2</sup>,  
Sadiah Mohamud Mohamed<sup>3</sup>, Yusuf Gedi Sheikhow<sup>1</sup>

<sup>1</sup>School of Medicine and Surgery, Somaville University, Mogadishu, Somalia

<sup>2</sup>Pediatric and Neonatology Department, University of Somalia Hospital, Mogadishu, Somalia

<sup>3</sup>Obstetric Department, Banadir Hospital, Mogadishu, Somalia

## Email address:

mgeedi143@gmail.com (Mohamed Gedi Sheikhow), zaahid5000@gmail.com (Abdisamad Sheikh Yusuf),

Dr.abdirahman@uniso.edu.so (Abdirahman Mohamed Ahmed), sdmi.org@gmail.com (Sadiah Mohamud Mohamed),

yuugeedi50@gmail.com (Yusuf Gedi Sheikhow)

\*Corresponding author

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**Abstract:** Obstructed labor (OL) is a typical reason for maternal morbidity and mortality in sub-Saharan Africa and Southeast Asia. A retrospective case-control study was conducted to determine the prevalence and risk factors of obstructed labor among pregnant women at selected public hospitals in Mogadishu-Somalia. Methods: a retrospective case-control study was conducted to ascertain risk factors of obstructed labor among pregnant women at selected public hospitals in Mogadishu-Somalia, from 1<sup>st</sup> July 2020 to 30<sup>th</sup> December 2020. The study site was one of the selected public hospitals in Mogadishu-Somalia, including Banadir, SOS, Madina Daynile, and Demartino public hospitals. The Maternal Sociodemographic factors, clinical factors, and complications associated with obstructed labor were obtained from selected public and clinical data. These variables were coded numerically and computerized using statistical analysis software called statistical package for social science (SPSS) version 24). **Results:** 143 out of 960 patients were obstructed Labor prevalence of 14.8%; according to age group, 22% were 15–19 years, over 47.2% were married, had educational levels (25.52%), and patients were illiterate. The majority (89.5%) of the patients were rural dwellers with (80.2%) who came from a distance between 30-59Km. Being nulliparous (first pregnancy) was the leading cause for the patients in obstructed labor (27.27%) of all the cases group. This was followed by being referred with Obstructed Labor (OL) (72.0%) and referred from Private health facilities alone, forming about (65.0%). The fetal risk factors observed in this study were Cephalo-pelvic disproportion, with a reported (71.1%), and fetal malpresentation, with (23.8%). The dominant maternal complication type reported in this study was ruptured uterus (43.3%) among obstructed labor. The most typical fetal complication was birth Asphyxia (40.5%), although there was a significant association between demographics, Obstetrical risk factors, and the developing obstructed labor. Conclusion: This study showed a high prevalence of obstructed labor, and sociodemographic attributes and obstetrical factors are causal factors to its development. The results of this study make it clear that the Ministry of Health and other healthcare stakeholders must seek to scale up present facility-based interventions to improve maternal outcomes and lessen the effects and incidences of obstructed labor.

**Keywords:** Prevalence, Risk Factors, Obstructed Labor, Somalia

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## 1. Introduction

According to Ahmed (2010, 1, 4), “the obstructed labor is the result of the mechanical reasons of the lack of descent of the part fetus in the birth canal, despite the adequate uterine contraction.” [1]. Obstructed labor (OL) is a life-threatening obstetric complication attributed to major maternal and perinatal morbidity [2]. Cephalo-pelvic disproportion is the most frequent cause of OL due to cephalopelvic disproportion occurring in the mother during childbirth with malnutrition, infection, poliomyelitis, deformity, and sickle cell anemia. It also occurs in adolescents due to an increase in the diameter of the presenting part, such as deformity and poor representation, such as eyebrows, composite representation, occiput posterior and mento posterior representation of the face, and congenital malformations (hydrocephalus, fetal ascites, and double monsters). “Ovarian tumor or fibroma in the pelvis below the presenting part, cervical and vaginal stenosis, streaked perineum in primigravida and included twins” [2] affect the fetus by causing intracranial bleeding due to severe head contouring leading to a tentorial tear or traumatic delivery, kaput, fetal distress and acidosis due to fetal hypoxia, maternal acidosis, and neonatal sepsis.

The fetus will die due to anoxia upon the extended duration of inhibition of labor. The anoxia results from excessive pressure exerted on the umbilical cord and the placenta. The decomposition of the dead fetus causes its softening and triggers clotting. Uterine failure and contractions resulting in uterine rupture lead to bleeding, hemorrhagic shock, and death. Reducing maternal morbidity and mortality means an improvement in handling long-term complications like fistula, cervical stenosis, and secondary amenorrhea [2]. The expectant mother presented with a history of early fetal membrane rupture, protracted first-stage labor, and, if an obstruction hampers labor, additional symptoms and consequences such as altered vital signs, tiredness, metabolic acidosis, genital infection, and injury. Birth obstruction treatment aims to rapidly remove the obstruction while also addressing the fluid imbalance, infection control, bladder comfort, and infection management. For fetal head misalignment in living babies, surgical options included cesarean sections, followed by surgical vaginal deliveries, and destructive deliveries for dead fetuses, where alternatives included therapy. [3, 2]

Annually, over 585,000 women globally succumb to a complication during pregnancy and childbirth. More than 70% of all maternal deaths are attributed to five significant complications, such as infection, bleeding, hypertension disorders of pregnancy, unsafe abortion, and obstructed labor [4, 5]. Among these causes of maternal morbidity, “obstructed labor (OL) is frequently reported in sub-Saharan Africa and Southeast Asia.

The estimated global occurrences of obstructed labor are 5% of pregnancies and have been linked to 8% of maternal deaths. This is an indicator of inadequate quality obstetric care and a cause of adverse maternal and prenatal outcomes

due to uterine rupture, caesarian deliveries complications, hemorrhage, anesthesia-related complications, sepsis, and asphyxia [6, 7].

The maternal mortality ratio in Somalia is estimated to be above 732 a reduction from 1044 maternal deaths per 100,000 births in 2012 as estimated by the Somalia Health indicators report [8]. Somalia’s fertility rate per woman is third highest in the world [8]. The total number of hospital-based births was 9%, and a skilled attendant conducted only 26% of the deliveries. Most (84%) mothers in Somalia undergo traditional home-based delivery. Additionally, the proportion of hospital deliveries has been reported to be higher in urban areas compared to rural areas at 17% and 5%, respectively. [8] 26% of women undergo antenatal care at least once in their pregnancy, while 6% make at least 4 or more visits. On the contrary, 74 percent did not receive ANC [9]. Numerous studies have indicated that obstructed labor is preventable through proper nutrition during childhood, prenatal care, and examination if pelvic at 36 weeks. Additionally, good obstetric care and a robust referral system in the nearest medical facility or mother’s waiting room is vital in preventing obstetric labor [9].

Although it is considered a common health problem, there is a dearth of data on obstructed labor in the study area. Therefore, this study is essential in providing the needed information regarding the problem, finding out the causes of obstructed labor, and disclosing the sociodemographic factors associated with maternal care concerns like obstructed labor. This study aids in rolling out an effective evidence-based intervention. Based on this, the current study was designed to assess the prevalence and risk factors associated with obstructed labor among pregnant women at selected public hospitals in Mogadishu- Somalia. The data obtained from this study will assist planners, policymakers, and other healthcare sector stakeholders in developing appropriate strategies and interventions to tackle maternal health problems.

## 2. Methods

### 2.1. Study Design/Site

The study design of this study was a retrospective case-control study designed to determine risk factors of obstructed labour among pregnant women at selected public hospitals in Mogadishu- Somalia, 1<sup>st</sup> July 2020 to 30<sup>th</sup> December 2020. The study site was one of the selected public hospitals including Banadir, SOS, Madina Daynile, and Demartino hospital public hospital, in Mogadishu- Somalia; these hospitals were four main referral public hospitals in Somalia with a 1000 bed capacity each hospital and run several specialized clinics including the gynaecologist and obstetrician unit.

### 2.2. Eligibility Criteria

During the period from 1<sup>st</sup> July 2020 to 30<sup>th</sup> December 2020, 143 women were diagnosed with obstructed labour.



### 2.2.1. Cases

For the second active stage of labour, arrest was defined as a delay of > 2 hours for the nullipara and > 1 hour for the multipara with adequate uterine contractions. In addition, a case had to have any two of the following obvious signs of severe obstruction.

### 2.2.2. Controls

Controls were women admitted to the labour suit within the same 24-hour period in active labour without obstruction.

### 2.3. Collection of Respondents Data

A checklist was used to obtain information/data from the maternity, operating theatre registers and patients' files. The researcher and a colleague double checked the completed checklists to ensure that all the information has been properly collected and recorded.

### 2.4. Data Quality Control

In order to ensure internal consistency, before and during data processing, the information was re-checked for completeness, the data collection tool was pre-tested on five maternity cases (from the maternity register) with obstructed labor to check for clarity of the items and also to identify any confusing or any vague items in the checklist.

### 2.5. Data Analysis Methods

Data Recorded in the questionnaire form were sorted into variable lists. These variables were coded in a numeric form and were computerized by using statistical analyzer software called statistical package for social science (SPSS) version 24 the integrity and consistency of the data was checked by

running the frequencies of each variable. Variable analyzes were performed for categorical variables and likelihood ratios were used to quantify the strength of the association between possible risk factors associated with Obstructed labor in pregnant women and multiple logistic regressions. was used to control the confusing effect of various variables by assessing the effect of each variable on the likelihood of OL.

### 2.6. Ethical Consideration

Ethical Approval to conduct the study was sought from the concerned authorities which was include; Institutional Research, Ethical Review Committee (IRERC) of Somaville University.

## 3. Results

### 3.1. Sociodemographic Characteristics

Table 1 shows the distribution of cases and controls according to basic demographic characteristics, including age, marital status, Educational level, occupation, Place of residence, facility or hospital site, and distance from home to hospital. In most age of cases, 143 women were diagnosed as having obstructed labour. The mean age was 24.5 years, with a standard deviation (SD) of 4.7. The findings clearly show that the age groups of 15–19 years among cases were 59 (22.10%), compared to the 13 (4.8%) control group. Regarding this study; marital status, this study findings clearly show that the married groups among cases were 135 (47.2%), compared to 140 (48.95%) of control group, both groups those were married were predominant.

**Table 1.** Socio-demographic Characteristics.

		Class code	
		Case% N =143	Control%
Age (in Years)	Mean	1.95	2.76
	Married	135 (47.2%)	140 (48.95%)
Marital status	Divorced	6 (2.10%)	2 (0.70%)
	Widowed	2 (0.70%)	1 (0.35%)
	Informal	39 (13.6%)	13 (4.5%)
Educational level	Primary	20 (10.0%)	46 (16.0%)
	Secondary	10 (3.5%)	64 (22.2%)
	University	110 (0.70%)	8 (3.0%)
Occupation	Illiterate	73 (25.52%)	12 (4.2%)
	Employee	25 (17.4%)	86 (60.0%)
	Non-Employee	118 (82.5%)	57 (40.0%)
Place of residence	Rural	128 (89.5%)	114 (79.7%)
	Urban	15 (10.5%)	29 (20.3%)
Facility or Hospital	Benadir Hospital	43 (30.0%)	52 (36.0%)
	Sos Hospital	34 (23.7%)	24 (16.7%)
	Madina Hospital	27 (19.0%)	6 (4.0%)
Distance from home to hospital	Daynile Hospital	23 (23.7%)	42 (29.0%)
	Demartino Hospital	16 (11.0%)	19 (13.0%)
	Mean	3.31	2.22

According to Place of residence obstructing labor were more common from Rural areas 128 (89.5%) of case.

According to distance from home to the facility, this study found that majority of cases 69 (80.2%) came from a distance



between 30-59Km, compared, compared 59 (88.1%) controls came from a distance between less than 9Km (0-9), This clearly showed that most of obstructs labor cases comes from long distance compared to those are control who didn't have obstructs labor.

### 3.2. Obstical Maternal Characteristics

Table 2, shows the distribution of cases and controls according to Obstical Maternal factors including, parity, Mode of delivery, reasons for procedures, and frequency of pantograph use. The most patients (n=78; 27.27%) were Primagravida (first pregnancy), compared to 14 (4.9%)

Primagravida of control groups. Regarding this study; Being referral,, this study findings clearly show that the referral were high among cases were 103 (72.0%) of cases were referred from other facility, compared to 3 (28.0%) of control groups. Regarding source of referral, this study found that majority of cases majority and 93 (65.0%) of cases were referred from Private health facility. According to usage of the partograph by the midwives, this study showed that, 36, (25.0%) of the cases, the partograph was not utilised, compared to 34 (24.0%) of control groups. It became evident that in about a quarter of all cases (n=64; 45.0%) cases the partograph was only being used partially.

**Table 2.** Obstical Characteristics.

		Class code	
		Case 143 N%	Control 143 N%
Parity of the mother			
Primagravida		70 (27.0%)	14 (4.9%)
Being referral?	Yes	103 (72.0%)	3 (28.0%)
	No	40 (14.0%)	140 (49%)
Source of referral	Public health facility	50 (34.9%)	3 (5.7%)
	Private health facility	93 (65.0%)	0 (0.0%)
	Normal vaginal delivery	9 (17.3%)	43 (30.0 %)
	Vacuum	22 (15.%)	18 (12.5%)
Mode of delivery	Forceps	21 (36.8%)	36 (28.5%)
	C-section	83 (74.8%)	28 (19.5%)
	Distractive operation	8 (6.5%)	18 (12.5%)
	Cephalo-pelvic disproportion	69 (71.1%)	28 (19.5%)
	Fetal malpresentaion	34 (23.8%).	36 (28.5%)
Reasons for procedures/instrument	Fetal distress	7 (5.9%)	8 (6.5%)
	APH	0 (0.0%)	63
	Amniotic infection	11	8 (6.5%)
	Large baby	22; 15.3%)	0
	None	36 (25.0%)	34 (24.0%)
Frequency of correct use of partogram	Partial	64; (45.0%)	83 (58.0%)
	Complete	43 (30.0%)	26 (18%)

### 3.3. Maternal and Fetal Complication Types

In table 3 shows, according to distribution of maternal Complications, it reports that ruptured uterus was the commonest type according for (n=62; 43.3%), compared to 1 (0.7%) of controls and 84 (58.7%) did not from suffer any physical complications, 8 (6%) cases had serious consequences such as sepsis, compared to 18 (12.5%) of control groups, and 34 (24%) cases had compared 40 (28/0%) had PPH or serious hemorrhage that required transfusion, and 4 (2.7%) cases had developed fistula. according to fetal complications, showed that the majority

(n=58; 40.5%) cases suffered from Asphyxia, compared to 24 (16.7%) of controls, 23 (16.0%) cases had still birth, compared to 11 (7.6%) of control groups, and 18 (12.5%) cases were dead, compared 3 (2%) deaths of control group, and 44 (30.7%) cases had no complications at all immediately after delivery, compared 105 (73.4%) of control group. According Baby weight 32 (22.3.0%) of cases were >4Kg, compared to 4 (3%) of control groups, and 72 (50.0%) of cases were between 3.6-4Kg, compared to 88 (61.5%) of control groups, while 36 (25%) cases were 2.5-3.5Kg, compared 50 (35%) of control group, and 3 (2.0%) of cases were <2Kg.

**Table 3.** Maternal and fetal complication types.

		Class code	
		Case 143 N%	Control 143 N%
Maternal complication	Uterine rapture	62 (43.4%)	1 (0.7%)
	Sepsis	8 (5.6%)	18 (12.6%)
	PPH	34 (23.8%)	40 (28.0%)
	Fistula	4 (2.8%)	0 (0.0%)
	Death	5 (3.5%)	0 (0.0%)
	No complication	30 (21.0%)	84 (58.7%)
	Total	143 (100.0%)	143 (100.0%)



		Class code	
		Case 143 N%	Control 143 N%
Fetal complication	Asphyxia	58 (40.6%)	24 (16.8%)
	Still birth	23 (16.1%)	11 (7.7%)
	Death	18 (12.6%)	3 (2.1%)
	No complication	44 (30.8%)	105 (73.4%)
	Total	143 (100.0%)	143 (100.0%)
Weight of baby	<2 Kg	3 (2.1%)	1 (0.7%)
	2.5-3.5 Kg	36 (25.2%)	51 (35.7%)
	3.6-4 Kg	72 (50.3%)	88 (61.5%)
	>4 Kg	32 (22.4%)	3 (2.1%)
	Total	143 (100.0%)	143 (100.0%)

### 3.4. Distribution of Obstructs Labor to Sociodemographic Characteristics

Table 4 shows the distribution of cases and controls according to basic demographic factors including age, marital status, Educational level, occupation, Place of residence, facility or hospital site, and distance from home to hospital. The most age of cases 143 women who were diagnosed as having obstructed labor the mean age was

24.5 years with a standard deviation (SD) of 4.7. The findings clearly show that the age groups of 15–19 years among cases were 59 (22.10%), compared to 13 (4.8%) of control group, A regression analysis, chi-square test showed that there is statistical significant association between age of mother and obstructs labor age 15–19 years among case since the P value is less than <0.05 (0.0000) confidence interval 95% (0.0000).

**Table 4.** Distribution of obstructs labor to Socio-demographic Characteristics.

		Class code		
		Case% N =143	Control%	P value
Age (in Years)	Mean	1.95	2.76	0.0000
Marital status	Married	135 (47.2%)	140 (48.95%)	0.29756
	Divorced	6 (2.10%)	2 (0.70%)	
	Widowed	2 (0.70%)	1 (0.35%)	
Educational level	Informal	39 (13.6%)	13 (4.5%)	0.0000
	Primary	20 (10.0%)	46 (16.0%)	
	Secondary	10 (3.5%)	64 (22.2%)	
	University	110 (0.70%)	8 (3.0%)	
Occupation	Illiterate	73 (25.52%)	12 (4/2%)	<.0000
	Employee	25 (17.4%)	86 (60.0%)	
	Non-Employee	118 (82.5%)	57 (40.0%)	
Place of residence	Rural	128 (89.5%)	114 (79.7%)	0.022
	Urban	15 (10.5%)	29 (20.3%)	
Facility or Hospital	Benadir Hospital	43 (30.0%)	52 (36.0%)	<0.0000
	Sos Hospital	34 (23.7%)	24 (16.7%)	
	Madina Hospital	27 (19.0%)	6 (4.0%)	
	Daynile Hospital	23 (23.7%)	42 (29.0%)	
	Demartino Hospital	16 (11.0%)	19 (13.0%)	
Distance from home to hospital	Mean	3.31	2.22	<0.0000

Regarding this study; marital status, this study findings clearly show that the married groups among cases were 135 (47.2%), compared to 140 (48.95%) of control group, A chi-square test showed that there is no statistically significant association between marital status and obstructs labor since the P value is greater than 0.05 (0.298) with the confidence interval 95% (0.405-.370). According to Place of residence obstructs labor were more common from Rural areas 128 (89.5%) of case. A chi-square test showed that there is statistically significant association between Place of residence obstructs labor since the P value >0.05 (0.022). According to distance from home to the facility, this study found that majority of cases 69 (80.2%) were came from a distance between 30-59Km, compared, compared 59 (88.1%) controls came from a distance between less than 9Km (0-9), This clearly showed that most of obstructs labor cases comes from

long distance compared to those are control who didn't have obstructs labor. A chi-square test showed that there is statistically significant association between distances from home to the facility obstructs labor since the P value is less than 0.05, the confidence interval OR: 95% (1.147-3.413). There was statistically significant association between the Socio demographic characteristics like age, educational level, occupation, Place of residence, facility or hospital site, and distance from home to hospital and Obstructs labor, while, marital status were not significantly associated with being Obstructs labor.

### 3.5. Distribution of Obstructs Labor to Obstetrical Characteristics

Table 5 shows the distribution of cases and controls according to basic Obstrical Maternal factors including,



parity, Mode of delivery, reasons for procedures, and frequency of pantograph use. The most women (n=78; 27.27%) were nulliparous (first pregnancy), 24 (8.39%) were para 1, A regression analysis, chi-square test showed that there is statistical significant association between parity of nulliparous (first pregnancy), with mother and obstructs labor among case since the P value is less than <0.05 (0.0000) 95%CI (0.245-1. 307). Regarding this study; Being referral,, this study findings clearly show that the referral were high among cases were 103 (72.0%) of cases were referred from other facility, compared to 3 (28.0%) of control groups, A chi-square test showed that there is statistical significant association between Being referral and

obstructs labor since the P value is greater than 0.05 (0.000) with the confidence interval 95%CI 0.94 (0.883-1.370). Regarding source of referral, this study found that majority of cases majority and 93 (65.0%) of cases were referred from Private health facility, 50 (34.9%) of cases were referred from public health facility, compared to 3 (5.7%) of control groups. A chi-square test showed that there is statistical significant association between source of referral and obstructs labor since the P value is less than 0.05 (<0.020). Cases OP were 1.108012 times more likely to have Private health facility obstructs labor compared to the others with urban areas the confidence interval 95% (0.232-4.353).

**Table 5.** Distribution of obstructs labor to Obstetrical Characteristics.

		Class code		
		Case 143 N%	Control 143 N%	P Value
Parity of the mother				
Primagravida		70 (27.0%)	14 (4.9%)	0.0005
Being referral?	Yes	103 (72.0%)	3 (28.0%)	
	No	40 (14.0%)	140 (49%)	
Source of referral	Public health facility	50 (34.9%)	3 (5.7%)	0.002
	Private health facility	93 (65.0%)	0 (0.0%)	
	Normal vaginal delivery	9 (17.3%)	43 (30.0 %)	0.000
	Vacuum	22 (15.%)	18 (12.5%)	
Mode of delivery	Forceps	21 (36.8%)	36 (28.5%)	0.000
	C-section	83 (74.8%)	28 (19.5%)	
	Distractive operation	8 (6.5%)	18 (12.5%)	0.000
	Cephalo-pelvic disproportion	69 (71.1%)	28 (19.5%)	
	Fetal malpresentaion	34 (23.8%).	36 (28.5%)	0.000
	Fetal distress	7 (5.9%)	8 (6.5%)	
Reasons for procedures/instrument	APH	0 (0.0%)	63	0.035
	Amniotic infection	11	8 (6.5%)	
	Large baby	22; 15.3%)	0	0.035
	None	36 (25.0%)	34 (24.0%)	
Frequency of correct use of partogram	Partial	64; (45.0%)	83 (58.0%)	0.035
	Complete	43 (30.0%)	26 (18%)	

According to usage of the pantograph by the midwives, this study showed that, 36, (25.0%) of the cases, the pantograph was not utilised, compared to 34 (24.0%) of control groups. It became evident that in about a quarter of all cases (n=64; 45.0%) cases the pantograph was only being used partially. The researcher was also interested to know the causes for the OL. This study shows that several different diagnoses were indicated obstructed labor for the decision to perform C/Section in order to save the life of the baby and protect the mother from complications as well. The two main cases of obstructed labor among cases were Cephalo-pelvic disproportion 69 (71.1%), the second were fetal malpresentaion for 34 (23.8%). Slight variations on similar situations where: large baby (n=22; 15.3%), Amniotic infection (n=11; 7). A chi-square test showed that there is statistical significant association between source of referral and obstructs labor since the P value is less than 0.05 (<0.020). It was observed that Parity of the mother, Source of referral, Mode of delivery, and Reasons for

procedures/instrument, were statistically significantly associated with the obstructed labor for.

### 3.6. Distribution of Obstructs Labor to Type of Maternal and Fetal Complications

In table 6 shows, according to distribution of maternal Complications, it reports that ruptured uterus was the commonest type according for 62 (43.4%) compared to 1 (0.7%) of controls, A binary regression analysis, showed that there is statistical significant association between type of maternal Complications and obstructs labor among case since the P value is less than <0.05 (0.0000), birth Asphyxia, were the majority 24 (16.7%) of case patients, with P value is less than <0.05 (0.0000). and big weight of 3.6-4 Kg 72 (50.3%) were the most associated with obstructs labor There was statistically significant association between the type of maternal and child Complications, Weight of baby and obstructs labor.



**Table 6.** Distribution of obstructs labor to type of Maternal and fetal complication.

		Class code		
		Case 143 N%	Control143 N%	P Value
Maternal complication	Uterine rupture	62 (43.4%)	1 (0.7 %)	0.000
	Sepsis	8 (5.6%)	18 (2.6%)	
	PPH	34 (23.8%)	40 (28.0%)	
	Fistula	4 (2.8%)	0 (0.0%)	
	Death	5 (3.5%)	(0.0%)	
Fetal complication	No complication	30 (21.0%)	84 (58.7%)	0.000
	Asphyxia	58 (40.6%)	24 (16.8%)	
	Still birth	23 (16.1%)	11 (7.7%)	
	Death	18 (12.6%)	3 (2.1%)	
	No complication	44 (30.8%)	105 (73.4%)	
Apgar score of the fetus				
Weight of baby	<2 Kg	3 (2.1%)	1 (0.7%)	0.000
	2.5-3.5 Kg	36 (25.2%)	51 (35.7%)	
	3.6-4 Kg	72 (50.3%)	88 (61.5%)	
	>4 Kg	32 (22.4%)	3 (2.1%)	

## 4. Discussion

This study evaluated the prevalence and risk factors of obstructed labor among pregnant women at selected public hospitals in Mogadishu-Somalia, considering their sociodemographic and obstetrical characteristics. We studied 143 out of 960 patients with Obstructed Labor prevalence of 14.8%. According to the age group, 22% were 15–19 years old, over 47.2% were married, and had educational levels (25.52%), among which some patients were illiterate. The majority (89.5%) of the patients were rural dwellers with (80.2%) who came from a distance between 30-59Km. Being nulliparous (first pregnancy) was the leading cause for the patients in Obstructed labour, constituting (27.27%) of all the cases group. This was followed by being referred with Obstructed Labor (OL) (72.0%) and referred from Private health facilities alone, forming about (65.0%). The fetal risk factors observed in this study was Cephalo-pelvic disproportion with a reported (71.1%), and fetal malpresentation with (23.8%). The dominant maternal complication type reported in this study was ruptured uterus (43.3%) among obstructed labor. The commonest fetal complication was birth Asphyxia (40.5%). Although there was a significant association between demographics, Obstetrical risk factors, and the developing obstructed labor.

This study's highest prevalence of obstructed labor was recorded in the ages 15-19. This is comparable to a study performed in Pakistan Public Sector University, Jimma University Specialized Hospital, Khyber Teaching Hospital, and Adigrat General Hospital. Similar observations were also made in a study conducted in South West Uganda. Regarding parity, most of the obstructed labor (27.2%) were nulliparous (first pregnancy) women. Additionally, 89.5% of the women with obstructed labor were from rural residences. This finding on the high prevalence of obstructed labor among primigravida women and those in rural areas is comparable with the study conducted in other parts. Similar results showing high prevalence has been reported from Uganda,

Medari Teaching Hospital and Pakistan, and Jhalawar Medical College [10, 11]. The high prevalence of obstructed labor among women in their first pregnancy depicts a major problem of early marriage and pregnancy in Somalia. The lack of timely access to health facilities in rural areas explains the disproportionately high prevalence of obstructed labor in such residential areas.

The results of this study indicate that cephalo-pelvic disproportion (CPD) was the risk factor causing the highest (71.1%) obstructed labor. This finding is reflected in other similar studies. One of such studies in South West Uganda indicates CPD caused 63.7%. Similar to the results of this study, a study conducted in Jimma University Specialized Hospital indicated that CPD caused 67.6% of obstructed labor. Another study in Adigrat General Hospital indicated that 64.9% of obstructed labor was attributed to CPD. However, two studies revealed a much lower proportion, one at Pakistan Public Sector University and another at Khyber Teaching Hospital, with 49.9% and 47.5%, respectively [10, 12]. A much higher proportion of obstructed labor cases caused by were reported by a study in Gambel Specialized hospital at 83%. This proportion was higher than the result of this study [13]. Given this analysis, Cephalo-pelvic disproportion is a common cause of obstructed labor. This result is mostly reported in countries where early marital age and Childhood malnourishment is common.

The findings of this study indicate that fetal malpresentation accounted for 23.8% of obstructed labor. This result is closely consistent with previous studies. The study in Jimma University reported that malposition and malpresentation accounted “for 25% of obstructed labor”. [14] However, the data reflected in this study is relatively lower than the results of studies conducted in Khyber Teaching Hospital, Pakistan Public Sector University, and Jhalawar Medical College, which were 45.5%, 43.3%, and 30%, respectively. The was high frequency of malposition and malpresentation cases among multigravida, as depicted in other reports.

Finally, the study indicates that fetal weight was a



significant factor responsible for obstructed labor. A fetal weight above 4kg is known to increase the likelihood of cephalopelvic disproportion, which is a major cause of obstructed labor [15, 16]. In this study, the highest proportion of fetal birth weight was between 3.6 and 4 kg. In a clinical trial study in central Uganda by authors Ndibazza et al. a mean fetal birth weight of 3.17 kg was reported among 2,507 pregnant women recruited [17], similar to our findings.

## 5. Limitations

This study is based on a quantitative retrospective case-control study, and the data is derived from hospital records, the generalization of the findings by extrapolation to the general population is limited. However, this limitation has been addressed since the study is multicenter utilizing the data from four referral healthcare facilities offering maternal services in south Somalia. There is a need for an additional study implementing a mixed quantitative and qualitative study design to dive into observations in our study, such as the incidence of obstructed labor in private maternity health facilities and the aegis of informal caregivers by pregnant women.

## 6. Conclusion

This study reveals a high prevalence of obstructed labor in Somalia. It discloses sociodemographic attributes and obstetrical factors causing obstructed labor development. As much as the government has pushed for interventions to address this health problem, cephalopelvic disproportion remains the main cause of obstructed labor. This causative factor reveals that childhood malnutrition and early marriage still require sustainable and long-term solutions. Mothers who have obstructed labor commonly experience uterine rupture and post-partum haemorrhage. This study makes it clear that the Ministry of Health and other healthcare stakeholders must seek to scale up present facility-based interventions to improve maternal outcomes and lessen the effects and incidences of obstructed labor.

## Competing Interests

The authors declare no competing interest.

## Authors' Contributions

MGS and ASH developed the study concept. AMA and MGS collected and collated the data and carried out the statistical analysis. MGS, SMM, and YGS did the literature search and prepared and contributed to the primary manuscript and all made critical contributions to the manuscript. All the authors read and agreed to publish the manuscript.

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