

The Epidemiology of Induction of Labor among Women Aged 15 - 49 Who Delivered at Shaafi Hospital in Hodon District, Mogadishu Somalia 2020

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Abstract

Background: Induction of labor is an artificial termination utilized to decrease both maternal and neonatal morbidity and mortality. The study was aimed to assess the epidemiology of induction of labor among women aged 15 - 49 who delivered at Shaafi Hospital in Hodon District, Mogadishu Somalia 2020. **Methodology:** A cross-sectional and retrospective hospital-based study was conducted among 30 women aged 15 - 49 who had undergone induction of labor who were delivered at Shaafi Hospital Mogadishu during the period of the study from May-July 2020. Data were collected by interview method using structured questionnaire. Data analyzed was performed using Statistical Package for Social Science version 20. **Results:** The study showed that the majority of respondents 12 (40%) had undergone induction once time previously, followed by 8 (27%) had undergone induction previously two times, while 6 (20%) had undergone previously three times, 4 (13%) more than four times. 21 (70%) were delivered Spontaneous Vagina delivery (SVD), 6 (20%) were Cesarean section (CS) and 3 (10%) instrumental vaginal delivery. A total of (60%) were delivered in public hospitals, followed by (23%) were delivered in private hospitals and 5 (17%) home delivery. In addition the reasons of induction of labor a total of 27 (90%) were post term, followed by 2 (7%) were Intrauterine fetal death (IUFD), while few proportion of 1 (3%) were Pregnancy induced hypertension (PIH). Finally, the study revealed that the socio-demographic and obstetrical determinants such as age and daily meal intake as well as antenatal care visit and reasons for induction of labor e.g. Post term (Post-mature), Intrauterine fetal death (IUFD) and Pregnancy induced

hypertension (PIH) showed significant association with their the induced labor ($P < 0.001$). While not significant have been observed with mother's gestational age with their induction of labor. **Conclusion and Recommendations:** The study recommended that ministry of health especially maternal and reproductive health unit should ensure that every pregnant woman has access to skilled maternal counseling and improve quality of antenatal, develop a national guideline of induction labor and continue training health workers at health facilities and monitor its implementations across the country.

Keywords

Induction, Labor, Shafi Hospital, Mogadishu Somalia

1. Background

Induction of labor refers to artificial stimulation of uterine contractions before the true onset of spontaneous labor in order to achieve vaginal delivery; induction Labor is typically induced by using one of the following methods: Cervical ripening agents, artificial rupture of membranes, and uterine stimulation with oxytocin [1].

Induction of labor with the goal of achieving vaginal delivery prior to spontaneous onset of labor is recommended when the benefits of delivery out-weight the risk of continuing the pregnancy [2].

The World Health Organization (WHO) recommends induction is to be performed with a clear medical indication and when expected benefits outweigh potential harms [3].

The most common indication for induction of labor is prolonged pregnancy. The aim is to improve the health outcomes of the mother and/or baby. Induction of labor beyond 41 weeks' gestation has been shown to reduce rates of caesarean section, operative vaginal delivery, meconium staining and macrosomia (birth weight > 4000 g) and risk of fetal and neonatal death [4].

Worldwide, the prevalence of labor induction varies greatly between countries and even between different regions of the same country. In general, however, it is higher in developed countries (at around 20%) than in developing countries [5].

In the United States of America and the United Kingdom, about 23% of all deliveries are by induction of labor [6] [7] while 11.4% was reported in Latin America [8]. Rate of induction labor are low in some Africa region evidenced by only 3% of women had an induction of labor in Nigeria hospitals [9].

There are a number of complications of pregnancy that confer significant ongoing risk to the mother or fetus (e.g., preeclampsia; preterm premature rupture of the membranes (PPROM); intrauterine growth restriction (IUGR); and post term pregnancy). For these conditions, induction of labor (IOL) is often the principal medical intervention utilized to decrease both maternal and neonatal mor-

bidity and mortality [10].

In Somalia, the national rate of induction of labor (IOL) is not known.

2. Problem Statement

Worldwide, the prevalence of labor induction varies greatly between countries and even between different regions of the same country. In general, however, it is higher in developed countries (at around 20%) than in developing countries. [5]. the study conducted in Latin America showed that the average induction of labor was 11.4% (lower, 5.1% in Peru and higher, 20.1% in Cuba). Whereas the factors like: Age \geq 35 years, being unmarried, Parity, PROM, hypertension during pregnancy and number of ANC visit \geq 4 were significantly associated to the rate of induction of labor [8].

In Nigeria, the magnitude of induction of labor was 6.5% and in D.R. Congo which was 3.2% [11]. Their research conducted in Ethiopia, Addis Ababa two teaching hospitals magnitude of induction of labor was 4% [12]. Induction of labor is one of the most common procedure in obstetrics and one of the fastest growing procedures in the world mainly in developed countries. The reason why it rises is unclear but there are some assumptions, like a growing use of labor induction for post term pregnancies, an increasing trend towards elective induction of labor and induction with mothers' request (elective induction) [13]. Furthermore, many pregnant women around the world to have undergone labor induction to deliver their babies this is factors generally included; gestational age of 41 completed weeks or more, pre-labor rupture of amniotic membranes, hypertensive disorders, maternal medical complications, fetal death, fetal growth restriction, chorioamnionitis, multiple pregnancy, vaginal bleeding and other complications etc. [5]. Although induction of labor is a daily practice at public and private health hospitals in Somalia; the national rate of induction of labor (IOL) is not known. However, the maternal mortality rate in Somalia in 2016 was 732 maternal deaths per 100,000 live births, which is among the highest in the world. Accordingly, the lifetime risk of maternal death in Somalia is among the worlds highest, 1 in 22, exceeded by only Chad and Sierra Leone [14]. Since Somalia demographic health survey report 2020 neither National Health information system (NHIS) indicators do not include information on induction of labor and In Somalia The civil registration and vital statistics system (CRVS) including maternal death Surveillance and Response is lacking knowing the epidemiology of inductions of labor is crucial. A total of 370 women were derived in shaafi hospital from October 2019 to 31 March 2020. While 40 were induced deliveries, 206 were spontaneous vaginal deliveries and 124 were cesarean section deliveries respectively. Therefore, the epidemiology of induction of labor among women aged 15 - 49 who delivered at Shaafi hospital in Hodon district, Mogadishu Somalia 2020.

3. General Objective

The main objective of this study was to assess the epidemiology of induction of

labor among women aged 15 - 49 who delivered at Shaafi hospital in Hodon district, Mogadishu Somalia 2020.

4. Specific Objective

The specific Objective of this study was:

- 1) To determine the prevalence of induction labor among women aged 15 - 49 who had undergone induction of labor at Shaafi hospital for the period of six months from October 2019 to March 2020.
- 2) To identify socio-demographic determinants among women aged 15 - 49 who had undergone induction of labor at Shaafi Hospital Mogadishu during the period of the study from May-July 2020.
- 3) To describe obstetric determinants among women aged 15 - 49 who had undergone induction of labor at Shaafi Hospital Mogadishu during the period of the study from May-July 2020.

5. Method and Material

5.1. Study Design

This study was a cross-sectional and retrospective hospital-based study.

5.2. Study Populations

The study population under study was selected includes:

- 1) Hospital medical records of women aged 15 - 49 who had undergone induction of labor at Shaafi hospital for the period of six months from October 2019 to March 2020.
- 2) All women aged 15 - 49 who had undergone induction of labor at Shaafi Hospital Mogadishu before the study period was excluded.

5.3. Study Area

The Shaafi Hospital is private specialist hospital that is located near Digfer hospital it is bounded by Somali-sudanese hospital from north and Jamhuriya University from East and Karmel hotel from West.

5.4. Sampling Technique and Sample Size

The sampling technique of this study was non-probability sampling technique.

The sample size of this study was 30 voluntary participants of women aged 15 - 49 who had previously undergone induction labor who were delivered at Shaafi Hospital Mogadishu during the period of the study from May-July 2020.

5.5. Method of Data Collection

During the study, a different tool was used for collecting data from different sources.

Secondary sources: including hospital record, books, reports, published papers, official documents, etc. Primary sources was carried out using interviewer-admini-

nistered questionnaire that will be designed into two parts first part contain socio-demographic information, which's of age, residence, marital status, educational level, occupation, family income, and second part which include the epidemiology of induction of labor among women aged 15 - 49 who delivered at Shaafi hospital in Hodon district, Mogadishu Somalia 2020.

5.6. Quality Control Techniques (Validity and Reliability)

Validity:

Validity of the instruments made certain through asking fellow peers from various health science departments and the supervisor to examine and evaluate the questions before they're finalized and administered, until they agreed upon for final use in the collection of data.

Reliability:

The researchers were done pretest/retest the questionnaires and interviews guides among health workers in the study area to check for errors, unclear responses and Consistency.

5.7. Data Analysis

The data was conducted, processed and transferred to computer coding, A variables' descriptive analysis was adopted which includes percentages, frequency distribution tables and figures by using Statistical Package for Social Sciences SPSS Version 16 computer program, 0.05 was used as a cut off significance value.

5.8. Ethical Considerations

The approval letter was obtained from Benadir University; therefore, researchers were asking permission to the hospital administrators to conduct study in Shaafi hospital.

The researchers explained the purpose and benefits of the study to the respondents and ask them for their permission to answer the questions. Participation in the study was totally voluntary. Participants were not forced to participate in the study. Even those who initially accepted to participate were free to withdraw in the course of the study if they did not wish to continue.

5.9. Result and Main Findings

The sample size of this study was 30 voluntary participants of women aged 15 - 49 who had previously undergone induction labor who were delivered at Shaafi Hospital Mogadishu during the period of the study from May-July 2020.

Table 1 showed that the majority of the respondents 18 (60%) were aged between 25 - 34 years, followed by 8 (27%) were aged between 25 - 34 yrs. While only 4 (8%) were between aged 35 - 44 yrs. And a total of 21 (70%) were married, 5 (17%) were divorced, 4 (13%) were widowed, and a total of 11 (37%) were primary level, while 7 (23%) were illiterate. And a total of 21 (70%) were

Table 1. Socio-demographic characteristics about the patients.

	Frequency	Percentage
Age Group		
15 - 24 yrs	8	27%
25 - 34 yrs	18	60%
35 - 44 yrs	4	13%
45- 54 yrs	0	0%
Total	30	100%
Marital Status		
Married	21	70%
Divorced	5	17%
Windowed	4	13%
Total	30	100%
Educational Level		
Illiterate	7	23%
Primary	11	37%
Secondary	9	30%
University	3	10%
Total	30	100
Employment Status		
Housewives	21	70%
Employed	4	13%
Student	5	17%
Total	30	100%
Family Income		
\$100 - \$200	4	13%
\$300 - \$400	15	50%
\$500 above	9	30%
Prefer not to say	2	7%
Total	30	100%

housewife, followed by 4 (13%) were employed. A total of 15 (50%) there income was in between \$300 - \$400 monthly and followed 9 (30%) there income per month was above \$500.

Table 2 showed that 12 (40%) had undergone induction once time previously, followed by 8 (27%) had undergone induction previously two times, while (20%) had undergone previously three times, 4 (13%) more than four times. 21 (70%) were delivered Spontaneous Vagina delivery (SVD), 6 (20%) were Cesarean section

Table 2. Obstetric determinants.

	Frequency	Percentage
Number of Previous deliveries through induced labor		
One time	12	40%
Two times	8	27%
Three times	6	20%
Four times and more	4	13%
Total	30	100%
Mode of Previous deliveries		
Spontaneous Vagina delivery (SVD)	21	70%
Instrumental vaginal delivery	3	10%
Cesarean section (CS)	6	20%
Total	30	100%
Number of Previous deliveries (life)		
One time	22	73%
Two times	2	7%
Three times	0	0%
Four times and more	0	0%
Some of them died	6	20%
Total	30	100%
Place of delivery		
Public facilities (MCH or hospital)	18	60%
Private Hospitals	7	23%
Home delivery	5	17%
Total	30	100%
Gestational Period		
0 - 3 months (0 - 12 Weeks)	0	0%
4 - 6 months (13 - 24 Weeks)	0	0%
7 - 9 months (25 - 36 weeks)	3	10%
10 months (42) Weeks	27	90%
Total	30	100%
Reasons of induced labor		
Post term (Post-mature)	27	90%
Premature rupture of membrane (PROM)	0	0%
Intrauterine fetal death (IUFD)	2	7%
Gestational diabetes mellitus (GDM)	0	0%

Continued

Pregnancy induced hypertension (PIH)	1	3%
Total	30	100%
Starting time of ANC visit		
0 - 3 months (0 - 12 Weeks)	1	3%
4 - 6 months (13 - 24 Weeks)	9	30%
7 - 9 months (25 - 36 weeks)	3	10%
10 months (42) Weeks	0	0%
Had no previous ANC Visit	17	57%
Total	30	100%
Daily sleep habit		
Fix time	4	13%
Some of the time	23	77%
Most of the time	3	10%
Total	30	100%
Household chores		
Fix time	2	7%
Some of the time	6	20%
Most of the time	22	73%
Total	30	100%
Household chores		
Fix time	2	7%
Some of the time	6	20%
Most of the time	22	73%
Total	30	100%
Meal intake		
Once a day	1	3%
Twice a day	26	87%
Three times a day	3	10%
Total	30	100%

(CS) and 3 (10%) instrumental vaginal delivery. In **Table 2**, 22 (73%) gave a safe birth (a life newborn) through induced labor one time, followed by 2 (7%) two times, 6 (20%) gave birth (dead newborn) through induced labor one time with their previous deliveries. A total of (60%) were delivered in public hospitals, followed by (23%) were delivered in private hospitals and 5 (17%) home delivery. In **Table 2**, a total of respondents 27 (90%) were 10 months (42 Weeks) of gestational period while having induced labor, while 3 (10%) were between 7 - 9 months (25 -

36 weeks). the reason of having induction of labor among study respondent about 2 (27 (90%) responded post term, followed by 2 (7%) were Intrauterine fetal death (IUFD), while only 1 (3%) were Pregnancy induced hypertension (PIH).

In **Table 2**, A total of 9 (30%) were started their ANC visit during the period between 4 - 6 months (13 - 24 Weeks), followed by 3 (20%) who were started their ANC visit in between 7 - 9 months (25 - 36 weeks). While most proportion about 17 (57%) had no previous ANC visit.

In **Table 2**, total of 23 (77%) were often take their daily sleep sometimes, while 4 (13%) had daily sleep in fixed time.

In **Table 2**, total of 22 (73%) had household chores sometimes, while 6 (20%) had household chores mostly.

In **Table 2**, total of 26 (87%) had daily meal intake twice during their previous pregnancies, while 3 (10%) had three times a day.

Table 3 showed When Women’s previous frequencies induced labor were cross tabulated to their reasons of induction showed that 26 (87%) women who previously had induced one were due to Post term (Post-mature), followed by 2 (7%) of women who previously had induced two times were due to Intrauterine fetal death (IUFD). Significant difference was strongly observed ($P = 0.00$).

Table 4 illustrated Women’s previous frequencies of induced labor were cross tabulated to their ANC visit showed that 13 (43%) of women who had previously induced once time was not visiting ANC during their previous pregnancies.

Table 3. Cross tabulate between women’s previous frequencies of induced labor according to their reasons.

Previous Induced Labor	Reasons of Previous induced labor			Total	P. Value
	Post term (Post-mature)	Intrauterine fetal death (IUFD)	Pregnancy induced hypertension (PIH)		
One time	26 (87%)	0 (0%)	0 (0%)	26 (87%)	$(P = 0.000)$
Two times	1 (3%)	2 (7%)	0 (0%)	3 (10%)	
Three times	0 (0%)	0 (0%)	1 (3%)	1 (3%)	
Total	27 (90%)	2 (7%)	1 (3%)	30 (100%)	

Table 4. Cross tabulate between women’s previous frequencies of induced labor according to their ANC visit.

Previous Induced Labor	Women’s ANC Visit			P. Value
	Yes	No	Total	
One time	13 (43%)	13 (43%)	26 (87%)	$(P = 0.171)$
Two times	0 (0%)	3 (10%)	3 (10%)	
Three times	0 (0%)	1 (3%)	1 (3%)	
Total	13 (43%)	17 (57%)	30 (100%)	

Followed by 3 (10%) of women who had previously induced two times was not visiting ANC during their previous pregnancies. Significant difference was not observed ($P < 0.171$)

Table 5 illustrated Women's previous frequencies of induced labor were cross tabulated to their daily meal intake showed that 25 (83%) of women who had previously induced once time were taking their daily meal twice a day during previous pregnancies. While 1 (3%) of women who had previously induced three times were taking their daily meal twice a day during their previous pregnancies. significant difference was strongly observed ($P < 0.001$).

6. Discussion and Recommendation

This study aimed at to assess the epidemiology of induction of labor among women aged 15 - 49 who delivered at Shaafi hospital in Hodon district, Mogadishu Somalia 2020 during the period of the study from May-July 2020.

In **Table 1**, the study revealed that 18 (60%) were aged between 25 - 34 years, followed by 8 (27%) were aged between 25 - 34 yrs. While only 4 (8%) were between aged 35 - 44 yrs. 21 (70%) were married, 5 (17%) were divorced, 4 (13%) were windowed. While (37%) were primary level, while 7 (23%) were illiterate. The results explained that 21 (70%) were housewife, followed by 4 (13%) were employed, 15 (50%) there income was in between \$300 - \$400 monthly, followed 9 (30%) reported that their household income per month was above \$500.

In **Table 2**, Major indication for induction of labor includes maternal, fetal, social or combination of these factors. These indications may also either be evident or anticipated [15]. Another study done by centers for disease controls Vital Statistics (USA) Induction rates do not seem to increase with age when you look at birth certificate data [16].

In **Table 2**, Studies showed that a higher percentage of nulliparous women were induced (36.4%) than multiparous women (27.2%) [17]. Previous research conducted in United Kingdom posits that increase women who are more educated may be able to more confidently advocate for themselves both before and during their pregnancy and birth [18]. Some previously published studies on childbirth intervention and labor induction, which have found that income-based measures of socioeconomic status have significant associations with induction of labor [19].

Table 5. Cross tabulate between women's previous frequencies of induced labor according to their daily meal intake.

Previous Induced Labor	Daily meal intake				P. Value
	Once a day	Twice a day)	Three times a day	Total	
One time	1 (3%)	25 (83%)	0 (0%)	26 (87%)	($P = 0.000$)
Two times	0 (0%)	1 (3%)	2 (7%)	3 (10%)	
Three times	0 (0%)	0 (0%)	1 (3%)	1 (3%)	
Total	1 (3%)	26 (87%)	3 (10%)	30 (100%)	

In **Table 2**, total of 9 (30%) were started their ANC visit during the period between 4 - 6 months (13 - 24 Weeks), followed by 3 (20%) who were started their ANC visit in between 7 - 9 months (25 - 36 weeks).

In Previous same study showed that the rate of induced labor was higher among laboring mother who had not ANC follow-up compared to the other counterpart. And there was statistically significant association between the ANC follow-up and induction of labor ($P < 0.000$) [20].

In **Table 2**, total of 12 (40%) had undergone induction once time previously, followed by 8 (27%) had undergone induction previously two times, while 6 (20%) had undergone previously three times, 4 (13%) more than four times. 21 (70%) were delivered Spontaneous Vagina delivery (SVD), 6 (20%) were Cesarean section (CS) and 3 (10%) instrumental vaginal delivery.

In **Table 2**, the current study showed that 22 (73%) gave a safe birth (a life newborn) through induced labor one time, followed by 2 (7%) two times. While 6 (20%) gave birth (dead newborn) through induced labor one time with their previous deliveries. A total of (60%) were delivered in public hospitals, followed by (23%) were delivered in private hospitals and 5 (17%) home delivery.

A Study conducted in Addis Ababa Army Referral Hospital showed out of 76 women who undergone induction about 59.7% women had successful induction [21]. In Aga Khan Hospital, Pakistan, (81.9%) that revealed an induced labor ended with vaginal delivery [5], King Khalid University Hospital who had registered (84%) of women had vaginal delivery considered as successful outcome of IOL [22]. This discrepancy could be due to the difference in hospital setup, skilled professional and availability of different method for applying induction. [22]. Overall rate of induction for the African region was 4.4%. Most inductions being performed between 37 and 41 weeks of gestation [19]. The laboring mother with the gestational age (<42 weeks) show an increase in chance of success for induced labor for about 9.47 times compared to the mothers who had underwent induced labor with gestational age having greater than to 42 weeks [20].

In **Table 3**, according to this study the primary reason for induction of labor was premature rupture of membranes (PROM) followed by for post-date and medical disorders with pregnancy. This finding was in line with study done in Ain Shams University Maternity Hospital, Egypt [23].

In other study done in Kingdom of Saudi Arabia post-term pregnancy was found to be the most common indications followed by diabetes mellitus in participated women [22]. While the common indications for induction in Nepal study was post term pregnancy [24].

Fetal structural condition was matters for induction of labor in this study. Mothers who pregnant anomalic fetuses were 5.7 times more likely to get induction of labor [8] [25].

7. Conclusions

The study revealed that prevalence of induction labor among women aged 15 -

49 who had undergone induction of labor at Shaafi hospital for the period of six months from October 2019 to March 2020 were 40 women out of 370 women who were derived at shaafi hospital from October 2019 to 31 March 2020.

The result showed that the majority of the respondents 18 (60%) were aged between 25 - 34 years, followed by 8 (27%) were aged between 25 - 34 yrs. While only 4 (8%) were between aged 35 - 44 yrs. While 21 (70%) were married, while 11 (37%) were primary level, while 7 (23%) were illiterate, 21 (70%) were housewife, followed by 4 (13%) were employed. 15 (50%) their monthly income was in between \$300 - \$400 monthly (**Table 1**).

The study showed that a total of 12 (40%) had undergone induction once time previously, followed by 8 (27%) had undergone induction previously two times, while 6 (20%) had undergone previously three times, 4 (13%) more than four times. 21 (70%) were delivered Spontaneous Vagina delivery (SVD), 6 (20%) were Cesarean section (CS) and 3 (10%) instrumental vaginal delivery (**Table 2**).

The result showed that the outcomes of labor 22 (73%) gave a safe birth (a life newborn) through induced labor one time, followed by 2 (7%) two times. Followed by 6 (20%) who gave birth (dead newborn) through induced labor one time with their previous deliveries (**Table 2**).

In addition post term 27 (90%), followed by responded intrauterine fetal death (IUFD) 2 (7%) Pregnancy induced hypertension (PIH) 1 (3%) were found to be the main reason for their induction of labor (**Table 3**).

The study revealed that the socio-demographic and obstetrical determinants such as age, and daily meal intake as well as antenatal care visit during pregnancies and reasons for induction; e.g. Post term (Post-mature), Intrauterine fetal death (IUFD) and Pregnancy induced hypertension (PIH) showed significant association to the induced labor while non-significant have been observed with mother's gestational age and their induction of labor (**Table 4** and **Table 5**).

Recommendation

- The ministry should develop a national guideline of induction of labor for health workers in public and private health care facilities
- The study recommended that ministry of health should ensure that every pregnant woman has access to skilled maternal counseling to improve quality of antenatal care.
- To train all health workers especially (doctors, nurse and midwives,) in the health facility level on a national guideline of induction of labor and monitor its implementation to and ensure that all induction of labor procedures are performed only for acceptable indications across the country.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Gabbe, S.G., Niebyl, J.R. and Simpson, J.L. (2007) *Obstetrics Normal and Problem Pregnancies*. 5th Edition, Churchill Living Stone, London.
- [2] American College of Obstetrician and Gynecologist (ACOG) (2009) ACOG Practice Bulletin No. 107: Induction of Labor. *Obstetrics & Gynecology*, **114**, 386-397.
- [3] World Health Organization (2011) WHO Recommendations for Induction of Labour.
- [4] Crowley, P. (1995) Elective Induction of Labour at 41+ Weeks Gestation. In: Keirse, M.J.N.C., *et al.*, Eds., *Pregnancy and Childbirth Module*, Cochrane Library, Oxford.
- [5] Royal College of Obstetricians and Gynaecologists (2001) Induction of Labour. Evidence-Based Clinical Guideline Number 9. RCOG Press, London.
- [6] MacDorman, M.F., Matthews, T.J., Martin, J.A. and Malloy, M.H. (2008) Trends and Characteristics of Induced Labor in the United States, 1989-1998. *Paediatric and Perinatal Epidemiology*, **16**, 263-273.
<https://doi.org/10.1046/j.1365-3016.2002.00425.x>
- [7] National Collaborating Center for Women's and Children's Health (2008) Induction of Labor. Clinical Guideline. RCOG Press, London.
- [8] Guerra, G.V., Cecatti, J.G., Souza, J.P., Faúndes, A., Morais, S.S., *et al.* (2009) Factors and Outcomes Associated with Induction of Labor in Latin America. *BJOG: An International Journal of Obstetrics & Gynaecology*, **116**, 1762-1772.
<https://doi.org/10.1111/j.1471-0528.2009.02348.x>
- [9] Ekele, B.A. and Jaiyeola, A.O. (2012) Induction of Labor at Usmanu Danfodiyo University Teaching Hospital, Sokoto. *Trope J Obster Gynacol*, **19**, 74-77.
- [10] Caughey, A.B., Sundaram, V., Kaimal, A.J., *et al.* (2009) Maternal and Neonatal Outcomes of Elective Induction of Labor. Evidence Report/Technology Assessment AHRQ Publication No. 09-E005. Agency for Healthcare Research and Quality, Rockville.
- [11] Tandu-Umba, B., Tshibangu, R. and Muela, A. (2013) Maternal and Perinatal Outcomes of Induction of Labor at Term in the University Clinics of Kinshasa, DR Congo. *Open Journal of Obstetrics and Gynecology*, **3**, 154-157.
<https://doi.org/10.4236/ojog.2013.31A029>
- [12] Berhan, Y. and Dwivedi, A.D. (2007) Currently Used Oxytocin Regimen Outcome Measures at Term and Post Term. I: Outcome Indicators in Relation to Parity and Indication for Induction. *Ethiopian Medical Journal*, **45**, 235-242.
- [13] Sanchez-Ramos, L. (2005) Induction of Labor. *Obstetrics and Gynecology Clinics of North America*, **32**, 181-200. <https://doi.org/10.1016/j.ogc.2004.12.004>
- [14] United Nations Children's Fund (2016) Women and Children in Somalia: A Situation Analysis. United Nations Children's Fund, Geneva.
- [15] MacKenzie, I.Z. (2006) Induction of Labor at the Start of the New Millennium. *Reproduction*, **131**, 989-998. <https://doi.org/10.1530/rep.1.00709>
- [16] Dekker, R., Niles, M. and Breakey, A.A. (2016) Evidence on: Advanced Maternal Age. Evidence Based Birth. <https://evidencebasedbirth.com/advanced-maternal-age/>
- [17] Carter, S., Channon, A. and Berrington, A. (2020) Socioeconomic Risk Factors for Labour Induction in the United Kingdom. *BMC Pregnancy and Childbirth*, **20**, Article No. 146. <https://doi.org/10.1186/s12884-020-2840-3>
- [18] Tilden, E.L., Caughey, A.B., Lee, C.S. and Emeis, C. (2016) The Effect of Childbirth Self-Efficacy on Perinatal Outcomes. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, **45**, 465-480. <https://doi.org/10.1016/j.jogn.2016.06.003>

- [19] Fowle, B., Nafiou, I., Machoki, M., Mugerwa, K., Neves, I., *et al.* (2012) Unmet Need for Induction of Labor in Africa: Secondary Analysis from the 2004-2005 WHO Global Maternal and Perinatal Health Survey (A Cross-Sectional Survey). *BMC Public Health*, **12**, Article No. 722.
- [20] Abdulkadir, Y., *et al.* (2017) Induction of Labor Prevalence and Associated Factors for Its Outcome at Wolliso St. Luke, Catholic Hospital, South West Shewa, Oromia. *Internal Medicine*, **7**, 5.
<https://www.longdom.org/open-access/induction-of-labor-prevalence-and-associated-factors-for-its-outcome-atwolliso-st-luke-catholic-hospital-south-west-shewa-oromia-2165-8048-10002455.pdf>
- [21] Sara, H. and Yeshi, A. (2015) Assessment of Prevalence and Factors Affecting Success of Induction of Labour in Army Referral and Teaching Hospital Addis Ababa, Ethiopia. *Journal of Obstetrics and Gynaecology*, **34**, 45-53.
- [22] Al-Shaikh, G., Wahabi, H.A., Fayed, A.A., Esmail, S.A. and Al-Malki, G.A. (2012) Factors Associated with Successful Induction of Labor. *Saudi Medical Journal*, **33**, 298-303.
- [23] Ali, M.S., Abdelhafeez, M.A. and El-Sayed, M.A.I. (2013) The Distance from Maternal Perineum to Fetal Head as a Predictive of Successful Induction of Labor. *Nature and Science*, **11**, 19-25. <http://www.sciencepub.net/nature>
- [24] Rayamajhi, R.T., Karki, C., Shrestha, N. and Padhye, S.M. (2009) Indications for Labor Induction and Predictors for Failed Induction at KMCTH. *Kathmandu University Medical Journal*, **7**, 21-25.
- [25] Humphrey, T. and Tucker, J.S. (2009) Rising Rates of Obstetric Interventions: Exploring the Determinants of Induction of Labour. *Journal of Public Health*, **31**, 88-94. <https://doi.org/10.1093/pubmed/fdn112>