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Full Length Research Paper

Determinants of antenatal care booking among pregnant women in selected hospitals in Embu county, Kenya

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In Embu County, pregnant mothers begin attending antenatal care (ANC) clinics late in third trimester. According to World Health Organization (WHO) guidelines, pregnant mothers should start their ANC in the first trimester before sixteen weeks of gestation. The study sought to determine factors associated with late booking of the visits. The specific objective were to find out how past pregnancy experience, accessibility of health facilities and awareness on ANC bookings influence ANC booking among pregnant women attending Maternal Child Health (MCH) clinic in Embu County. The results of the study were aimed at promoting ANC initiation within the first trimester of pregnancy. The recommended ANC model helps minimize complications that occur during pregnancy, during labor and during postpartum period through early screening, diagnosis and treatment of infections. A descriptive cross-sectional study design was used to collect data. Most of the clients were aware of the booking time and despite this none turned up for ANC clinic within the right gestational age. Accessibility of health facilities and past pregnancy experience was significantly associated with initiation of ANC booking.

Key words: Antenatal care clinics, maternal child health, pregnant mothers, antenatal care (ANC).

INTRODUCTION

Antenatal care (ANC) is one of the four pillars for safe motherhood. The main objectives of focused antenatal care include: promotion of health, prevention of diseases, early detection of diseases and their management and complication readiness and birth preparedness (Kondale et al, 2016).

Focused antenatal care has been recommended by the WHO, to help pregnant mothers get screened early for conditions that may affect the outcome of pregnancy. As

a result of increased maternal deaths the WHO has come up with new guidelines on ANC visits whereby the pregnant women will have increased access to health care and these include first visit within 12 weeks, then at 20 weeks, 26, 30 34, 36, 38 and 40 weeks gestation. During these visits, the pregnant woman should be counseled on nutrition, malaria and HIV prevention, blood tests and tetanus toxoid (TT) vaccination, ultrasound services and provided with advice on how to deal

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with minor disorders in pregnancy (WHO, 2017).

It is recommended that pregnant women should attend a minimum of 4 comprehensive antenatal clinics. First visit should be at less than 16 weeks, second visit at 16-28 weeks, third visit at 28-32 weeks, and fourth visit at 36-40 weeks (Njoroge, 2012). Despite the recommended gestation of a pregnant woman to attend antenatal care booking visit, a significant proportion of pregnant women in developing countries attend booking visit after the first trimester (first 3 months) (Ouendo, 2015).

Globally, 82.6% of pregnant women attend antenatal care booking visit during the second and third trimester of pregnancy. This late antenatal care booking attendance lead to approximately 515,000 deaths every year as a result of complications related to pregnancy and childbirth (Erin, 2014). This was supported by another survey done in Ethiopia, which revealed complications of pregnancy are the leading causes of pregnant women deaths, where by it was found that 385,000 women usually die due to complications that occur during pregnancy and childbirth (Tolera, 2015). Majority of the maternal deaths (99%) occur in developing countries while more than half deaths usually occur in sub Saharan Africa. These findings were similar to another survey done in sub Saharan Africa, which indicated that most women attend antenatal care booking visit after the first three months of pregnancy (Christopher, 2013).

Several examinations and tests are usually carried out during antenatal care booking visit and they include screening for HIV infection and this helps in detection and prevention of mother to child transmission, screening for syphilis is also done and treatment given to the affected, provision of iron and folic acid supplements (IFAS) which helps to reduce risk of congenital malformations such as neural tube defect (Tolera, 2015). Pregnant women from malaria endemic areas receive treated mosquito nets and intermittent preventive therapy (IPTs). TT immunization is also given during pregnancy which helps to prevent mother from tetanus and the protection is also passed to the baby (Ouendo, 2015). During antenatal care booking visit, the first health assessment is done which includes weight, height, body mass index (BMI) calculation, blood pressure, blood and urine are assessed (Ayneh, 2015). In Pakistan, it was revealed during a study on timing of antenatal care initiation that the time a pregnant mother initiated the antenatal care clinics determined the quality and range of services to be received (Agha and Tappis, 2016).

On a study done in Nigeria on barriers to antenatal care attendance it was found out that infrastructure to access the health facilities was a problem, in the same report for those who accessed the facilities they were unable to afford the services. In other health facilities the services were unavailable (Fagbamigbe and Idemudia, 2015). In another study in Nigeria, it was revealed that past pregnancy experience, mothers' health status in the present pregnancy and ignorance on when to start the

antenatal care clinics contributed to late booking for antenatal care for pregnant mothers in selected hospitals (Nwaneri et al., 2018). Long waiting time and accessibility of the antenatal care services was cited as barriers to initiation of antenatal clinics among pregnant women in East London (Hatherall et al., 2016).

In Kenya, a study on men's perspectives on antenatal and delivery services, men were seen to facilitate utilization of antenatal care but that rarely translate to practice. Most of the men do not accompany their spouses to the clinics (Kwambai et al., 2013). In another study, pregnant women in Kenya were reported to initiate antenatal care clinics in the second and third trimesters compared to other countries which were under study (Bucher et al., 2015). Mothers feared to be reprimanded by health care providers, others cited mistimed conception, experience of previous pregnancy especially those who suffered complications motivated the pregnant mothers to initiate antenatal clinics early. Unmarried pregnant women hide their pregnancy and attended antenatal clinic later in pregnancy for fear of being known to be pregnant while the married and multipara women reported to initiate the antenatal clinics depending on previous pregnancy experience (Pell et al., 2013).

Long waiting times and staffs attitude were cited as barriers to attendance of antenatal clinics in the study on barriers and facilitators to antenatal and delivery care in Western Kenya. In the same study fear of knowing ones' HIV status early in pregnancy also deterred some women from attending antenatal clinics early (Mason et al., 2015). Ochako and Gichuhi (2016) found out that in Kenya, the wantedness and timing of the antenatal care clinics initiation depended on each other. The pregnant mothers who wanted the pregnancy were found to attend all the clinics as scheduled while those who had mistimed pregnancy or unwanted pregnancy were rarely seen to attend the clinics (Ochako and Gichuhi, 2016). Increase in age and the fact that the pregnant women are married increased utilization of antenatal care among these mothers in Malasyan setting (Yeoh et al., 2016).

MATERIALS AND METHODS

A cross sectional descriptive study was done in Embu County, targeting pregnant women attending antenatal care clinics. The study involved 110 respondents randomly sampled from Kianjokoma, Kibugu and Kirititri health facilities, in Embu County. During a preliminary survey done in the three hospitals in Embu County, Kenya, it was evident from ministry of health registers that majority of the mothers report to book for ANC visits in the third trimester. This predisposes them to late screening, diagnosis and treatment of preventable conditions which affect the pregnancy outcome. Reliability and content validity were established before actual data collection during pretesting. Research assistants were trained before administering the questionnaires to the mothers. Ethical clearance was sought from National Commission of Science, Technology and Innovation, Kenya and from Embu County Department of Health, Health Facility Administrators. Informed consent was obtained from the respondents before

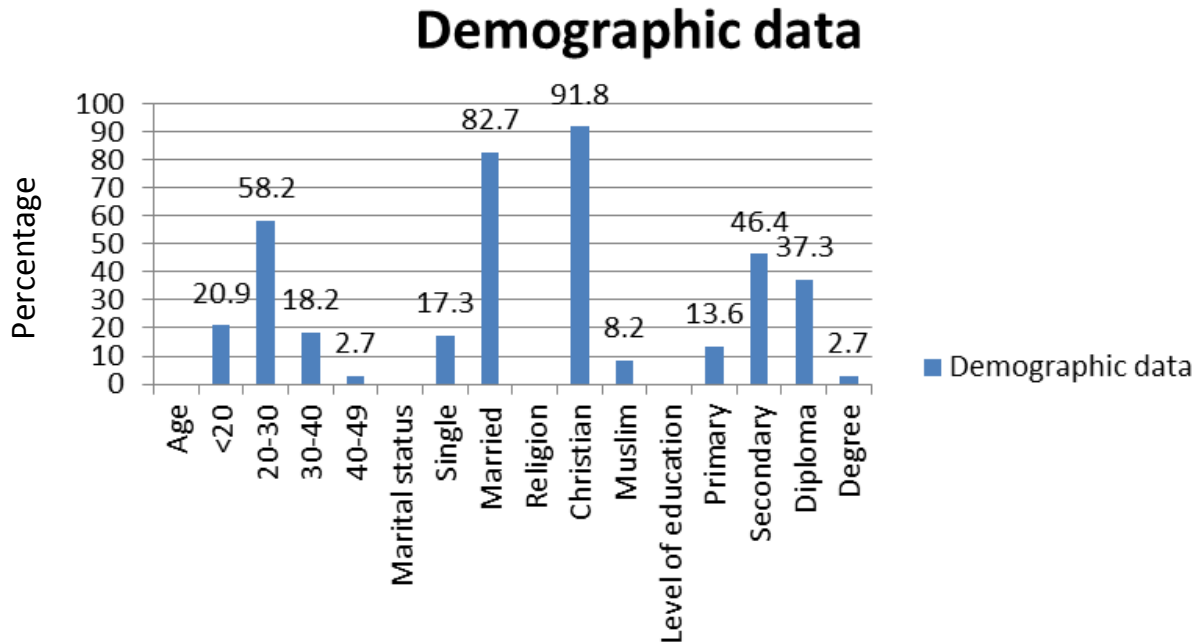


Figure 1. Demographic characteristics of the pregnant mothers.

participation in the study and confidentiality of the data collected maintained.

RESULTS

The ages of the participants ranged from 19 to 49 years of age, with a majority of them (58.2%) in the age bracket of 20 to 30 years. Majority of the pregnant mothers were Christians and married (91.8 and 82.7%), respectively. On employment status, most mothers were either self-employed or house wives, with a majority having secondary level of education. The summary of the demographic characteristics of the pregnant mothers who participated in the study is as shown in Figure 1.

The age of the participants was not significantly associated with booking for antenatal care clinic ($p \geq 0.05$). However, older pregnant mothers were reported to be free to initiate their antenatal clinics at any gestation while the young mothers tend to initiate their clinic at second or third trimester. Religion of the participant was also less likely to influence the timing for initiating antenatal care clinics. Majority of the participants initiated their clinics in the second and third trimester regardless of their employment status, house wives mostly initiated the clinics early compared to the employed mothers. However, this was not significantly associated with the timing to initiate antenatal clinics ($p \geq 0.05$, $\chi^2 = 4.241$).

Out of 15 mothers who had primary education, 13 of them initiated their antenatal clinics after six months of gestation. Only three mothers had a degree level of education and they booked their clinic late in the third

trimester. It was also revealed that 46.4% of the respondents had a secondary level of education and initiated their clinics in the second and third trimesters. During multiple regression, level of education had a positive association with employment status and been previously pregnant. When these two variables were adjusted and subjected to Chi-square analysis for time of initiating antenatal clinics, it was evident that the association was insignificant ($p \geq 0.05$).

Majority of the mothers were married with 17.3% of the participants being single. There was a positive association between being married and having been pregnant previously. As the age of the participant increased there was also a positive correlation with the marital status many being married as they age. Despite the positive correlation, marital status was not significantly associated with initiation of antenatal clinics ($p \geq 0.05$).

The study sought to establish the well-being of the pregnant mothers in the current pregnancy and it was found out that 16.4% of the mothers had been sick and sought medical intervention. On probing further it was established that these mothers were booked for antenatal clinics for the pregnancy after the medical intervention. Mothers, whose health was well, initiated the antenatal clinics late in pregnancy. Therefore, the health of the mothers during pregnancy was found to be positively correlated with initiation of antenatal clinics at 0.013; on analysis, the health of the mother was statistically significant ($p \leq 0.05$). Sick mothers were 5.737 times more likely to initiate their antenatal clinics than the mothers in good health.

Most of the participants (60%) had been pregnant previously, out of the 66 mothers who had been previously pregnant, only 8 initiated their antenatal clinics in the first trimester. Those who had never been pregnant initiated their clinics mostly in the third trimester; this was significantly associated with initiation of the antenatal clinic ($p \leq 0.05$). Being previously pregnant was positively correlated with the marital status, and level of education. Mothers with lower level of education were more likely to have been previously pregnant. When the variable for parity was adjusted, it was found out that those mothers who had been previously pregnant and had complications in the previous pregnancy initiated their antenatal clinics earlier compared to those who never had any complications in previous pregnancies. Complications in previous pregnancy was statistically found to determine the time to initiate the antenatal clinic in the current pregnancy ($p \leq 0.001$, $\chi^2 = 79.608$, $OR = 51.225$).

Cost implications on initiation of antenatal clinics was evaluated and it was found out that out of 21 mothers who reported the services to be affordable, only 3 had booked their clinic in the first trimester. Majority of the respondents (80.9%) reported that the services were not affordable. Affordability of the services was positively correlated with level of education and employment status. However, it was evident that those mothers who initiated their clinics late in pregnancy had been employed; therefore, the cost of the services was not a determinant of the time to book for the clinic, and this was insignificant ($p \geq 0.05$).

More than half of the mothers 68 (61.8%) were busy with their work schedule with only 14.5% being very busy and the rest had a flexible work schedule. Out of those who had a flexible work schedule only 2 out of 26 mothers who were found to have initiated their clinic in the first trimester. Those who had a busy schedule were 0.397 times more likely to initiate the antenatal clinics early than those who were flexible; therefore, flexibility of the work schedule was not significantly associated with initiation of antenatal clinics ($p \geq 0.982$).

In an African set up, men's decision is perceived to influence the timing for the clinic attendance but was not the case in this study. Out of 85 pregnant mothers who were advised by their spouses to initiate their antenatal clinic in the second trimester, only 28 mothers initiated their clinics before the third trimester. When a Chi-square was computed, the spouse's decision on when to initiate the antenatal clinic was not significantly associated with the timing for antenatal booking ($p \geq 0.05$).

Majority of the respondents 97 (88.2%) were aware on the right time to initiate antenatal clinics but this did not translate to actual booking for the clinics. Out of 97 mothers who were aware of the right timing, only 36 mothers booked their antenatal clinics at the right time. There was a negative correlation between awareness and initiation of the antenatal clinics. On Chi-square analysis, awareness of the right time was insignificant ($p \geq 0.05$). A summary of the statistical significance values

is shown in Table 1.

DISCUSSION

It is evident from the results that majority of the respondents initiated their antenatal clinics in the third trimester; this is in line with studies done by Bucher et al. (2015) and Linda (2015) which also found pregnant mothers to book for their antenatal clinics late in pregnancy.

The results of this study reveal that age, marital status, religion and employment status were found to rarely influence the time for initiating the antenatal clinics. Level of education was also not significantly associated with timing for antenatal care clinic initiation. These results are in contrast with the findings in Ghana and Malawi, which revealed that increase in age was associated with increased utilization of antenatal care services and early booking (Yeoh et al., 2016; Pell et al., 2013). In this study, increase in age was associated with marital status; whereby increase in age was associated with married status but was not statistically significant to influence the time to initiate the clinics.

Employment status which was positively correlated with affordability of the antenatal care services was not also significantly influencing early initiation of antenatal clinics. In Nigeria, affordability of antenatal services was associated with timing for antenatal clinics, however in this study affordability was found not to determine the timing for initiation of antenatal clinics (Fagbamigbe and Idemudia, 2015).

The results in this study revealed that the health status of the mother in the current pregnancy, past poor obstetric experiences and having been pregnant previously were the main determinants of antenatal care clinics initiation. These results are consistent with Nwaneri et al. (2018) who found out that past experience, health or illness of the mother and ignorance were determinants of late booking for antenatal care clinics. However, in this research ignorance was not a determining factor for antenatal booking since majority of the pregnant mothers were aware of when to initiate antenatal care booking but booked for the clinics at the right time.

Conclusion

The current health status of the pregnant mother and past obstetric outcomes are the key determinants of the timing for initiation of antenatal care booking. However, multiparity was associated with late antenatal booking.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

Table 1. Factors determining antenatal care clinic initiation.

Variable	Frequency (N=110)	Percentage	P -value
Ever been sick in this pregnancy			
Yes	18	16.4	P=0.046, Df=2, $\chi^2=6.147$
No	92	83.6	
Ever been pregnant previously			
Yes	66	60	P=0.029, Df=2, $\chi^2=7.05$
No	44	40	
Had any complication in the previous pregnancy			
Yes	11	10	P=0.000, Df=2, $\chi^2=79.6$
No	99	90	
Antenatal services are affordable			
Yes	21	19.1	P=0.336, Df=2, $\chi^2=2.179$
No	89	80.9	
How is your work schedule			
Flexible	26	23.6	P=0.982, Df=4, $\chi^2=0.407$
Busy	68	61.8	
Very busy	16	14.5	
When did your spouse advise you to book for the antenatal clinic			
0-3 months	19	17.3	P=0.105, Df=4, $\chi^2=7.663$
3-6 months	85	77.3	
6-9 months	6	5.5	
When are pregnant mothers expected to initiate their antenatal clinics			
0-3 months	13	11.8	P=0.808, Df=2, $\chi^2=0.427$
3-6 months	97	88.2	
At which month did you initiate your antenatal clinic			
0-3 months	8	7.3	-
3-6 months	34	30.9	
6-9 months	68	61.8	

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REFERENCES

- Agha S, Tappis H (2016). The timing of antenatal care initiation and the content of care in Sindh, Pakistan. *MBC Pregnancy and childbirth* 16(1):190.
- Ayneh GG (2015). Predictors of early antenatal care booking in government health facilities of Hossana town, Hadiya zone. *Journal of AIDS and clinical Research* 6(11).
- Bucher S, Marete I, Tenge C, Liechty E, Esamai F, Patel A (2015). A prospective observational description of frequency and timing of antenatal care attendance and coverage of selected interventions from sites in Argentina, Guatemala, India, Kenya, Pakistan and Zambia. *Reproductive Health* 12(2):S12.
- Christopher AM (2013). Factors affecting antenatal care attendance: Results from qualitative studies in Ghana, Kenya and Malawi. *Plos One* 8(1):e53747.
- Erin CP (2014). Factors affecting attendance at and timing of formal antenatal care: Results from a qualitative study in Madang, Papua New Guinea. *Plos One* 9(5):e93025.
- Fagbamigbe A, Idemudia E (2015). Barriers to antenatal care use in Nigeria: Evidences from non-users and implications for maternal health programming. *BMC Pregnancy and Childbirth* 15(1):95.
- Hatherall B, Morris J, Jamal F, Sweeney L, Wiggins M, Kaur I (2016). Timing of the initiation of antenatal care: An exploratory qualitative

- study of women and service providers in East London. *Midwifery* 36:1-7.
- Kwambai T, Delicour S, Desai M, Ameh C, Person B, Achieng F (2013). Perspectives of men on antenatal and delivery care services utilization in rural western Kenya. *BMC Pregnancy and Childbirth* 13(1):134.
- Linda SD (2015). Barriers and facilitators of antenatal and delivery care in western Kenya. *BMC Pregnancy and Childbirth* 15(1):26.
- Mason L, Delicour S, Kuile F, Ouma P, Philips-Howard P, Were F (2015). Barriers and facilitators to antenatal and delivery care in Western Kenya. *BMC Pregnancy and Childbirth* 15(1):26.
- Kondale M, Tumebo T, Gultie T, Megersa T, Yirga H (2016). Timing of first antenatal care visit and associated factors among pregnant women attending antenatal clinics in Halaba Kulito Governmental Health Institutions. *Journal of Women's Health Care* 5:308.
- Njoroge GJ (2012). National Guidelines for Quality Obstetrics and Perinatal Care. Available online at: <https://www.k4health.org/toolkits/kenya-health/national-guidelines-quality-obstetrics-and-perinatal-care>
- Nwaneri A, Ndubuisi I, Lewechi I, Ezike O, Nkiruka U (2018). Determinants of late booking for antenatal care among pregnant women in selected hospitals in South East Nigeria. *International Journal of Nursing and Midwifery* 10(7):74-80.
- Ochako R, Gichuhi W (2016). Pregnancy wantedness, frequency and timing of antenatal care visits among women of childbearing age in Kenya. *Reproductive Health* 13(1):51.
- Ouendo SJ (2015). Determinants of low antenatal care services utilisation during the first trimester of pregnancy in southern Benin rural setting. *Universal Journal of Public Health* 3(5):220-228.
- Pell C, Menaca A, Were F, Afrah N, Chatio S, Manda-Taylor L (2013). Factors affecting antenatal care attendance: Results from qualitative studies in Ghana, Kenya and Malawi. *Plos One* 8(1):e53747.
- Tolera DW (2015). Time of antenatal care booking and associated factors among pregnant women attending ambo town health facilities, central Ethiopia. *Journal of Gynecology and Obstetrics* 3(5):103-106.
- World Health Organization (WHO) (2017). New guidelines on antenatal care for a positive pregnancy experience. Available online at: https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/.
- Yeoh P, Hornetz K, Dahlui M (2016). Antenatal care utilization and content between low risk and high risk pregnant women. *PloS One* 11(3):e0152167.

Full Length Research Paper

Success of labour induction institution based cross-sectional study Wolaita Sodo, South Ethiopia

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There are a number of pregnancy complications that confer significant risk to the mother or fetus. Induction of labour is as an artificial termination of pregnancy utilized to decrease both maternal and neonatal morbidity and mortality. Institution based retrospective cross-sectional study was conducted among 347 pregnant women undergone induction of labour from 2013-2015 in Otona referral hospital. Nearly 207 (59.7%) of the women who undergone through induction of labor procedure had successful delivery of their baby. Premature rupture of the membranes 167(48.1%) was the most common reason for induction. Being women of age ≤ 24 years, having Bishop Score > 5 and Apgar score ≥ 7 at first minute were positively associated with successful induction of labour. Hospitals should have quality assurance programs and induction policies, including safety tools such as checklists, to ensure that inductions are performed in the best possible quality.

Key words: Induction of labour, failed induction, successful induction.

INTRODUCTION

Induction of labor refers to artificial stimulation of uterine contractions before the true onset of spontaneous labor in order to achieve vaginal delivery by medical or surgical means (Sanchez-Ramos, 2005; Rouse et al., 2011).

Augmentation of labor refers to increasing the frequency and the intensity of already existing uterine contractions in a patient in true labor but progressing inadequately, in order to achieve vaginal delivery (Sanchez-Ramos, 2005). There are a number of complications of pregnancy that confer significant ongoing risk to the mother or fetus like preeclampsia; preterm premature rupture of the membranes (PPROM); intrauterine growth restriction

(IUGR); and post term pregnancy. For these conditions, induction of labour (IOL) is often the principal medical intervention utilized to decrease both maternal and neonatal morbidity and mortality (Sanchez-Ramos, 2005).

The World Health Organization (WHO) recommends induction to be performed with a clear medical indication and when expected benefits outweigh potential harms. In addition to the rise in the rate of indicated induction of labour, it seems that there has also been an increase in the rate of induction of labour that is not indicated for a medical reason (Rouse et al., 2011). Major indications for

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induction of labour include maternal, fetal, social or a combination of these factors; these indications may also either be evident or anticipated (World Health Organization (WHO), 2011).

Despite its undisputed importance for ending risky pregnancies, this intervention may result in undesirable effect. Its outcomes are multi factorial, involving the synergistic influences of the patient, provider, system, and the intervention itself. Induction sometimes fails with potential risks of increased rate of operative vaginal delivery, caesarean birth, excessive uterine activity, uterine rupture, maternal water intoxication, abnormal fetal heart rate patterns, delivery of preterm infant due to incorrect estimation of dates, and possibly cord prolapse (MacKenzie, 2006).

The greatest maternal risk of ILO is the risk of morbidity associated with cesarean section (CS) for failed induction and for other obstetric indications like non-progress of labour and fetal distress (National Collaborating Centre for Women's and Children's (NCC-WCH), 2008).

There is a consensus that the success of induced labour is directly related to the status of the cervix, with higher CS rates in those with an unfavorable cervix. In addition other factors that contribute towards increasing the risks of a CS following labour induction include null-parity, obesity, mother's age above 30 years, fetal macrosomia, use of epidural anesthesia, use of magnesium sulphate and chorioamnionitis (Vrouenraets et al., 2005).

Despite the fact that IOL plays a vital role in reduction of maternal mortality, the success rate of induction and factors that contributes to it are not well studied in the study area. Therefore, this study aimed to identify factors that affect success of induced labour; which helps to improve quality of IOL and thereby decrease unnecessary indication of the procedure.

MATERIALS AND METHODS

Study design and setting

A retrospective cross-sectional study was employed from 2012 to 2015 in Wolaita Sodo University teaching referral hospital. The hospital is located in Wolaita zone of southern nations nationalities and people's regional state; 327 km from the capital Addis Ababa. Established in 1928, the hospital is currently serving more than 2 million people with about 195 inpatient beds.

Sampling and sample size

Single population proportion formula was used to calculate the sample size with the assumptions 0.05 significance level, 66.9% proportion of labor induction success (Barthélémy et al., 2013), 5% margin of error and 10% nonresponse rate. The final sample size was calculated to be 347. All women with induction of labor from registration book were selected back starting from 2015 to 2012 until desired sample size was achieved.

Data collection tool and procedure

The study included all registered women who had been delivered a gestational age of 28 weeks and above through induction of labour. Data were collected using a pretested structured questionnaire from the induction register and medical record files. Information regarding demographic features, details of induction of labour (indication, method, mode of delivery, complications, and neonatal outcome). Seven midwifery nurses guided by three supervisors collected the data on January 7, 2012.

Data processing and analysis

The filled questionnaires were checked for completeness and entered into EPI INFO version 3.5.3 statistical software and then exported to SPSS version 21 for further analysis. Descriptive statistics was used to describe the study population in relation to relevant variables. Both bivariate and multivariate logistic regression models were used to identify associated factors. Odds ratios and their 95% confidence intervals were computed and variables with p - value less than 0.05 were considered as significantly associated with the outcome variable.

Ethical consideration

Ethical clearance was obtained from the college of health sciences and medicine, Wolaita Sodo University. A formal letter of cooperation was written to the hospital. Anonymity was maintained to assure confidentiality.

Data quality assurance

Data quality was controlled by giving trainings and appropriate supervisions for data collectors. A pre-test was conducted on 5% of the records that are not included in the study. Appropriate modifications were made after analyzing the pretest result before the actual data collection.

Operational definitions

Induction of labour

Initiation of uterine contractions prior to its spontaneous onset after 28 weeks of gestation.

Failed induction of labour

Failure to achieve a vaginal delivery within 12 h after induction of labour was commenced.

Successful induction of labour

When a woman had achieved vaginal birth within 12 h after induction of labour was started.

Fetal heart rate non-reassuring

Fetal heart either below or above normal range following induction of labour

Table 1. Socio demographic characteristics women who undergone induction of labour from 2012 to 2015 in WSUTRH (N=347).

Characteristics	Frequency N=347	Percentage (%)
Age		
15-24	86	24.8
25-34	261	75.2
Religion		
Orthodox	161	46.3
Protestant	120	34.5
Muslim	53	15.2
No information	14	4
Ethnic group		
Wolaita	142	40.9
Amhara	73	21.1
Gurage	58	16.7
Hadiya	39	11.2
Other	35	10.1
Marital status		
Married	340	98.0
Others	7	4.0

RESULTS

Socio-demographic characteristics of the respondents

A total of 347 women's document was reviewed during the study period. From these women 231 were in the age group 25-34 years with the mean age of 27.23 (± 4.2) years. Greater proportion 161 (46.3%) of the women were Orthodox Christian and 132 (38.0%) of the participants belong to Amhara in ethnicity. Information on educational status of the participant was not found for greater than half 198 (57.1%) of the participant (Table 1).

Obstetric condition

The mean gestational age was 39.55 \pm 2.49 weeks (range: 30- 44 weeks). Of the included 347 women, 167(48.1%) undergone induction of labour for premature rupture of membranes (PROM). Out of the 294 women who had recorded information on bishop score 256 (73.8%) of them had a modified bishop score of greater than or equal to 6. Regarding method of induction, it is reported as all of the women had received intravenous Pitocin infusion (Table 2).

Success of labour induction

More than half (59.7%) of the women delivered vaginally within 12 h after induction, while 132 (37.8%) delivered

by CS; from this, 92 (26.5%) undergone CS due to failed induction of labor that means unable to deliver vaginally within 12 h, 24 (6.9%) were due to fetal distress, while the rest were due to different reasons like Cephalo-pelvic disproportion and malposition (Table 3).

Factors associated with success of labour induction

The odds of women with age of less than 24 years were 2 times [AOR=2.437 (1.126, 5.275)] higher than those who were age of 25 and above to experience successful induction. The likely hood of successful labour induction was approximately 2.6 times more prevalent among those women's with Apgar score of greater than 7 [AOR=2.61(1.40, 4.86)]. Significant association between women's bishop score and success of labour induction was observed, in which women with bishop score greater than 5 were about 7 times more likely to have successful induction when compared to those with less than or equal to 5 [AOR=7.51(2.44, 23.07)]. On the other hand the success of induction was 64% times lower among women with fetal heart rate record of non-reassuring [AOR=0.3(0.13-0.98)] (Table 4).

DISCUSSION

Induction of labour is one of the fastest growing medical procedures in current obstetric practice. In this study out of five women who undergone induction, three of them

Table 2. Obstetric condition of women who undergone induction of labour from 2012 to 2015 in WSUTRH (N=347).

Characteristics	Frequency	Percentage
Reason for induction		134
PROM	167	48.1
Post term	122	35.2
Medical disorders with pregnancy	42	12.1
No information	16	4.6
More than 90 DBP at booking		135
Yes	15	4.3
No	332	95.7
Bishop score		136
≤ 5	38	11.0
> 6	256	73.8
No information	53	15.3
Liquor foul smelling		137
Yes	18	5.2
No	307	88.5
No information	22	6.1
Gestational age		138
Less than 37 weeks	27	7.8
38 to 41 weeks	203	58.5
Greater than 42 weeks	91	26.2
No information	26	7.5

had successful induction. This finding was similar with study done in Nepal (Rayamajhi et al., 2009) and Congo (Barthélémy et al., 2013) where 65.38 and 66.9% of the participant undergone successful induction. In other way successful induction rate in this study was lower than study conducted in Saudi Arabia (Ghadeer et al., 2012) and Pakistan (Neelofur et al., 2012) in which 84 and 81.9% of women had successful outcome of IOL respectively. This discrepancy may be due to difference in quality of induction care provided by the hospitals.

Various methods have been recommended for induction of labour such as intra-cervical Foleys balloon, prostaglandin E2 and intra venous Oxytocin etc. In this study oxytocin IV infusion was used exclusively to induce induction. This finding was comparable with study done in Latin America (Guerra et al., 2009) where oxytocin IV infusion was used in about 90% of all labour inductions. This is also in agreement with other studies that have reported its use in 85-100% of inductions (Goffinet et al., 2003; Vahratian et al., 2005; Le Ray et al., 2007). But in study conducted in Egypt, 65.5% of the women received vaginal misoprostol while only 34.4% received intravenous oxytocin infusion as a method of labour induction. The decision whether to induce with oxytocin or misoprostol was probably not dependent on the favorability of the woman's cervix, but more on their availability and culture within the unit.

According to this study the primary reason for induction of labour was premature rupture of membranes followed by post-date and medical disorders with pregnancy. This finding was in line with study done in Egypt (Mohamed et al., 2013). Premature rupture of membranes was also found to be the commonest indication for induction of labour in study done on unmet need for induction of labour in Africa (Fawole et al., 2012). In other study done in Saudi Arabia (Ghadeer et al., 2012) post-term pregnancy was found to be the most common indications. While the common indications for induction in Nepal study was post term pregnancy (Rayamajhi et al., 2009). In this study it was found that, age was significant predictor for success of labour induction, its likelihood being greater among women of age less than 24 years; which is similar with study from Nepal (Rayamajhi et al., 2009). The condition of the cervix at the start of induction is an important predictor, with the modified Bishop score being a widely used and predominant risk factor scoring system (National Collaborating Centre for Women's and Children's (NCC-WCH), 2008) induction of labour results in high failure rate if the cervix is not ripe or vice versa (SOGC Clinical practice guidelines, 2001).

In line with these studies, the current finding also showed strong association between bishop score and successful induction of labour. The odds of successful induction were 7 times more likely in women with Bishop

Table 3. Outcome of induction of labour among women who undergone induction of labour from 2012 to 2015 in WSUTRH.

Characteristics	Frequency N=347	Percentage
Membranes already ruptured before induction (N=347)		
Yes	159	45.8
No	180	51.9
No information	8	2.3
Fetal heart rate non-reassuring following induction of labour (N=347)		
Yes	51	14.7
No	290	83.6
No information	6	1.7
Mode of delivery (N=347)		
		59.7
Vaginal delivery	207	
Caesarean section	131	37.8
Instrumental vaginal delivery	9	2.5
Newborn status at birth (N=347)		
		93.9
Alive	326	
Fresh/macerated still birth	21	6.1
APGAR at Birth (N= 326)		
≥8	177	54.3
≤7	149	45.7
APGAR at 5 min (N= 326)		
		84.7
≥8	276	
≤7	50	15.3
Admission to NICU (N= 326)		
		12.0
Yes ≤7 APGAR	39	
No	287	88.0
Reason for admission to NICU(N= 39)		
		46.2
Neonatal distress	18	
Meconium aspiration	9	23.1
Preterm	4	10.3
Others	8	20.5

Score above 5. Similarly study conducted at Kathmandu medical college teaching hospital to assess indications for labour induction and predictors for failed induction the 0-5 Bishop Score group accounted for the majority of failures 70.1% (Arulkumaran et al., 2008). Other study conducted to quantify the risk of cesarean delivery associated with medical and elective induction of labor, Bishop score of 5 or less was a predominant risk factor for a CS (Vrouenraets et al., 2005). In study that examines influence of labor induction on obstetric outcomes in patients with prolonged pregnancy, the Bishop score before induction was an important factor that affected the delivery outcome, resulting in significantly higher rates of cesarean section and vacuum

extraction when the score was unfavorable (Bodner-Adler et al., 2005).

In Ethiopian study done to evaluate the relation of Bishop Score and induction outcome measured by length of induction initiation-vaginal delivery time and modes of delivery, 45.7% induction failures was observed among the 0-5 Bishop score group (Berhan and Dwivedi, 2007). Apgar score at first and fifth minute was found to be one of indicators of successful induction related to the baby.

Pervious study done in Latin America has shown that induction was associated with lower 5th minute Apgar scores. In our study even though Apgar score at fifth minute did not show significant association, the success of induction of labour has increased as first Apgar score

Table 4. Factors associated with successful induction of labour among women who undergone induction of labour from 2012 to 2015 in WSUTRH.

Characteristics	Induction success		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age				
18-24	59(68.6)	27(31.4)	1.64(0.98, 2.77)	2.44(1.13,5.28) *
25-34	142(57.0)	107(43.0)	1.00	1.00
Gestational age				
Less than 41 weeks	150 (59.5)	102(40.5)	1.01 (0.62, 1.64)	0.66(0.24,1.86)
Greater than 42 weeks	54(59.3)	37(40.7)	1.00	1.00
Membranes already ruptured before induction				
Yes	102(64.2)	57(35.8)	1.43 (0.92, 2.22)	2.21(0.77,6.37)
No	100(55.6)	80(55.6)	1.00	1.00
Fetal heart rate non-reassuring following induction of labour				
Yes	20(39.2)	31(60.8)	0.31(0.17, 0.62)	0.36(0.13,0.99) *
No	184(63.4)	106(36.6)	1.00	1.00
Liquor meconium stained				
Yes	14(35.0)	26(65.0)	0.92 (0.61, 1.40)	0.40(0.15,1.06)
No	185(63.4)	107(36.6)	1.00	1.00
Bishop score				
> 5	169(66.0)	87(34.0)	8.60(3.64,20.33)	7.70(2.49,23.8)*
≤ 5	7(18.4)	31(81.6)	1.00	1.00
Reason for induction				
Post term	69(56.6)	53(43.4)	1.67(0.53, 2.15)	0.97(0.26,3.77)
PROM	106(63.5)	61(36.5)	0.80(0.39, 1.64)	0.79(0.19,3.33)
Medical disorders with pregnancy	26(61.9)	16(38.1)	1.00	1.00
Apgar score at birth				
> 7	128(72.3)	49(27.7)	3.88(2.45,6.67)	2.61(1.40,4.86)*
≤ 7	60(40.3)	89(59.7)	1.00	1.00

become greater than 7.

Limitation of the study

The study was limited by the retrospective use of a database, allowing only the available variables to be used. In this particular hospital, for example, information on general medical and past obstetric history were not routinely and clearly recorded. The study was conducted in one hospital and the results may not be representative of the entire country.

Conclusion

Three from five women who undergone induction had successful induction. Age ≤ 24, Bishop score greater than

5 and Apgar score ≤ 7 at first minute were positively associated with successful induction of labour. On the other hand women's with non-reassuring fetal heart beat at the beginning of induction were found to be less likely to have successful induction. Developing national evidence-based clinical practice guidelines for induction of labour is essential to ensure that inductions are performed only for acceptable indications.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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REFERENCES

- Arulkumaran S, Tambyraja RL, Heng S, Rathnam SS (2008). Failed induction of labour. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 25(3):190-193.
- Barthélémy T, Robert LT, Andy MM (2013). Maternal and perinatal outcomes of induction of labour at term in the university clinics of Kinshasa, DR Congo. *Open Journal of Obstetrics and Gynecology* 3(01):154.
- Berhan Y, Dwivedi AD (2007). Currently used. Oxytocin regimen outcome measures at term and post term: Outcome indicators in relation to Bishop Score and other covariates. *Ethiopian Medical Journal* 45(3):243-250.
- Bodner-Adler B, Bodner K, Patelsky N (2005). Influence of labour induction on obstetric outcomes in patients with prolonged pregnancy: a comparison between elective labour induction and spontaneous onset of labour beyond term. *Wiener Klinische Wochenschrift* 117(7-8):287-292.
- Fawole B, Nafiou I, Machoki (2012). Unmet need for induction of labour in Africa: secondary analysis from the 2004 - 2005 WHO Global Maternal and Perinatal Health Survey (A cross-sectional survey). *BMC Public Health* 12(1):722.
- Ghadeer K, Al-Shaikh GK, Wahabi HA, Fayed AA, Esmaeil SA, Al-Malki GA (2012). Factors associated with successful induction of labor. *Saudi Medical Journal* 33(3):298-303.
- Goffinet F, Dreyfus M, Carbonne B, Magnin G, Cabrol D (2003). Survey of the practice of cervical ripening and labour induction in France. *Journal de gynécologie, obstétrique et biologie de la reproduction* 32(7):638-646.
- Guerra G, Cecatti J, Souza J (2009). Factors and outcomes associated with the induction of labour in Latin America. *BJOG: An International Journal of Obstetrics and Gynaecology* 116(13):1762-1772.
- Gulmezoglu AM, Crowther CA, Middleton P (2006). Induction of labour for improving birth outcomes for women at or beyond term. *The Cochrane Database of Systematic Reviews* 6:CD004945.
- Le Ray C, Carayol M, Bre'art G, Goffinet F, PREMODA Study group (2007). Elective induction of labour: failure to follow guidelines and risk of cesarean delivery. *Acta obstetrica et gynecologica Scandinavica* 86(6):657-665.
- Mackenzie IZ (2006). Induction of labour at the start of the millennium. *Reproduction* 131(6):989-998.
- MacKenzie JZ (2006). Induction of labour at the start of the new millennium. *Reproduction* 131(6):989-998.
- Mohamed SA, Mohamed AA, El-Sayed MA (2013). The Distance from Maternal Perineum to Fetal Head as a Predictive of Successful Induction of Labour. *Natural Science* 11(5):19-25.
- National collaborating centre for women's and children's (NCC-WCH) (2008). Induction of labour Clinical Guideline. RCOG Press, Health 2nd edition.
- Neelofur BK, Iffat A, Ayesha M, Lumaan S (2012). Factors associated with failed induction of labour in a secondary care hospital. *Journal of the Pakistan Medical Association* 62(1):6.
- Rayamajhi RT, Karki C, Shrestha N, Padhye SM (2009). Indications for labour induction and predictors for failed induction at KMCTH. *Kathmandu University Medical Journal* 7(1):21-25.
- Rouse DJ, Weiner SJ, Bloom SL, Varner MW, Spong CY, Ramin SM (2011). Failed labor induction: Toward an objective diagnosis. *Obstetrics and Gynecology* 117(2 01):267.
- Sanchez-Ramos L (2005). Induction of labor. *Obstetrics and Gynecology Clinics* 32(2):181-200.
- Vahratian A, Zhang J, Troendle JF, Sciscione AC, Hoffman MK (2005). Labour progression and risk of cesarean delivery in electively induced nulli-paras. *Obstetrics & Gynecology* 105(4):698-704.
- Vrouenraets FP, Roumen FJ, Dehing CJ, van den Akker ES, Aarts MJ, Scheve EJ (2005). Bishop score and risk of cesarean delivery after induction of labour in nulliparous women. *Obstetrics and Gynecology* 105(4):690-697.
- World Health Organization (WHO) (2011). Recommendations for induction of labour. Geneva.
- World Health Organization (2007). Perinatal mortality. Country, regional and global estimates 2004. Geneva.
- World Health Organization (2010). Trends in maternal mortality: 1990 – 2008. Estimates developed by WHO, UNICEF, UNFPA and the World Bank. Geneva.

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