COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF PUBLIC HEALTH

DETERMINANTS OF REDUCED FETAL MOVEMENT AMONG MOTHERS FOLLOWED UP IN GOVERNMENT HOSPITALS, IN NORTH SHOA ADMINISTRATION ZONE, AMHARA NATIONAL REGIONAL STATE, ETHIOPIA: A CASE CONTROL STUDY.

BY: ABEBAW ALEMAYEHU

A THESIS SUBMITTED TO DEPARTMENT OF PUBLIC HEALTH, COLLEGE OF HEALTH SCIENCE, DEBRE BIREHAN UNIVERSITY FOR THE PARTIAL FULFILLMENT FOR THE REQUIREMENT FOR MPH IN REPRODUCTIVE HEALTH

AGUST 2021

DEBRE BERHAN, ETHIOPIA

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Declaration

To Be Approved By the Examining Board of Institute of Medicine and Health Science, Debre Berhan University.

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Acknowledgement

Firstly, I would like to acknowledge Debre Birhan University, College of Health Sciences for providing the opportunity to do this thesis and library services.

Secondly, I would like to say grateful thanks towards to the department of Public Health for their participation in topic selection and assigning an advisor.

Thirdly, I would like to express my deepest gratitude and appreciation to my advisor Dr Abebe Minda for his support and valuable comments during proposal development and thesis write up, his welcoming personality and gave me the opportunity to gather information that has great role for this thesis.

Lastly but not least, I am so happy to extend my appreciation to data collectors, supervisors and all study participants who took part in the study for their valuable and relevant information.

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Acronyms and Abbreviations

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
APGAR	Appearance, Pulse, Grimace, Activity and Respiration
CI	Confidence Interval
COR	Crude Odds Ratio
CS	**C**aesarean Section
DBU	Debre Birhan University
IOL	Induction of Labor
OPD	Out Patient Department
RFM	Reduced Fetal Movement
SPSS	**S**tatistical Package for Social Science

Abstract

Background: Maternal perception of decreased fetal movement is a common complaint, and one of the most frequent causes of unplanned visits that affects up to 15% of pregnancies. Not enough emphasis is placed on the risk factors for reduced fetal movement despite their higher association with maternal and fetal morbidity and mortality. Identifying the determinant factors for reduced fetal movement could help reduce maternal and fetal complications by providing close follow up for those at risk. Therefore, this study aims to identify the determinants of reduced fetal movements.

Methods: An unmatched case control study was conducted from March-May, 2021 among 129 (43 cases and 86 controls) pregnant women who followed up at North Shoa Zone Government Hospitals. Face to face interview with structured questionnaire and chart review were used for data collection. Cases were selected via consecutive sampling method, and controls were selected by systematic random sampling technique. The collected data was entered, cleaned, coded and checked by using Epi-Data version 3.1 and then exported to SPSS version 23 for data analysis. Binary logistic analysis was executed and all variables with p-value <0.2 was entered into multivariable logistic regression. Finally, multivariable logistic regression analysis was used to identify independent predictors of reduced fetal movement. P-value of less than 0.05 at 95% CI was considered as cutoff point to declare a statistically significant association.

Result: Post term pregnancy (AOR = 5.48, 95% CI=1.12-26.76), Preeclampsia/eclampsia (AOR =4.90, 95% CI= 1.64-14.67), Oligohydramnios (AOR= 4.71, 95% CI= 1.27-17.48), Primi gravida (AOR =4.31, 95% CI=1.38-13.45), and Anemia (AOR= 4.04, 95% CI= 1.07 -15.34) were found to be significantly associated factors of reduced fetal movement.

Conclusion: The determinants of reduced fetal movements were post term pregnancy, preeclampsia/eclampsia, oligohydramnios, prim gravida and anemia.

Keywords: Reduced Fetal Movement, Determinants, Pregnant Women, Ethiopia

1. Introduction

1.1 Background

Maternal and perinatal mortality is unacceptably high. Globally about 810 women die every day from preventable causes related to pregnancy and childbirth complications. Almost 94% of all maternal deaths occur in low and lower middle-income countries including Ethiopia(1).

The high number of maternal and perinatal morbidity and mortality in developing countries reflects not using the existed knowledge and services timely (2). Each year in Africa 30 million women become pregnant, and about 250,000 of them die from pregnancy-related causes (3).

East African nation including Ethiopia planned to reduce maternal mortality to199/100,000 live birth in 2020 and 70/100,000 or less by 2030 in line with target set by World Health Organization. This can be achieved by expansion of skilled personnel care before, during and after child birth (4). But low demand for modern maternal and perinatal health care services is a major public health concern in Ethiopia.

Reduced Fetal Movement is defined as maternal perception of reduced or absent fetal movements. It is less than 10 movements over 12 hours of normal maternal activity and the perception of at least 10 movements over two hours when the mother is resting and focused on country(5). Fetal movement is a subjective measure, mainly assessed by maternal perception, this counting allows the clinician to make appropriate interventions in right time to improve prenatal outcomes (6). Pregnant women become aware of fetal movement from 18-20 weeks and fetal movement increase normally after 28 weeks and that they should refer themselves immediately if they detected altered movement after 28 weeks (7).

Globally Reduced fetal movement (RFM) affects 5-15% of pregnancies and associated with poor prenatal outcomes (8). Women presenting with reduced fetal movement are at increased risk of poor pregnancy outcomes including still birth, preterm birth, low appearance, pulse, grimace, activity and respiration (APGAR) score and increased rate of cesarean section (9, 10).

Women presenting with decreased fetal movements do have higher risk of stillbirth, fetal distress, preterm birth, and other associated outcomes. Usually a fetus will have its own pattern of movements that the mother should be advised to get to know but there was limited evidence on pregnancy outcomes of reduced fetal movement in Ethiopia (9, 11).

1.2 Statement of the Problem

Globally, RFM clinical management is sub-optimal despite different studies revealed that the association between RFM and poor pregnancy outcome. Even though routine fetal movements (FM) counting should be a common practice in pregnancy to verify fetal wellbeing but Fetal Movement counting is not clinically practiced in developing countries including Ethiopia (12).

Maternal perception of reduced fetal movements affects up to 15% of pregnancies. Reduced fetal movements cause concern and anxiety and can be associated with poor pregnancy outcome (8-10). A reduction or change in fetal movements can be a warning sign for adverse outcomes in pregnancy therefore midwives have long acknowledged that a change in pattern of fetal movements may indicate a problem (13).

A systematic review and meta-analysis revealed that antenatal care visits were significantly associate. Thus, visiting antenatal care clinics during pregnancy is strongly recommended especially in resource-limited settings like countries of sub-Saharan Africa (14).

Maternal perception of reduced fetal movements is associated with poor perinatal outcomes such as still birth, low APGAR score, increase CS rate including fetal death (15).

A study done in Israel on Pregnancy outcome of women presenting with decreased fetal movements indicated that reduced fetal movement is a risk factor for poor pregnancy outcome both for the mother and the neonate (16). Case control study done in New Zealand indicated that understanding alterations in patterns of fetal movements prior to fetal death is clinically important and others study have shown that the most common presentation when the fetus has died is decreased fetal movements (17).

The study done in Ireland about Perinatal outcomes of reduced fetal Movements revealed that following presentation with RFM, 26.5 % of women were admitted to hospital for further monitoring and management and those in the RFM group were less likely to have a spontaneous onset of labour, and 54.7 %) of them undergo an induction of labour (IOL) (18).

The study conducted in UK and Ireland showed that there is reduction in still birth rate after implementation of standard care to reduced fetal movement (10, 19).

Different studies revealed that reduced fetal movement was associated with poor prenatal outcomes of those with preterm birth, perinatal birth injury, low birth weight, low Apgar score, increase rate of cesarean section, and neonatal and fetal deaths (8, 9, 16).

The study in Shashemene confirmed that among the most commonly mentioned danger sign of pregnancy absent or decreased fetal movements account 38.6%. In this study, women who were perceived reduced fetal movement had more adverse birth outcomes as compared to mothers who were not perceived reduced fetal movement (20).

As the study conducted in Injibara General Hospital showed that the pregnancy outcomes of women with reduced fetal movement were still birth 38%, preterm birth 33.7%, 5 minutes Apgar score < 7, 48.42% and cesarean section rate 29.47 % (9).

Even though antenatal care coverage reaches 74%, good number of health professional and Hospitals in Amhara national regional state one of the common danger sign during pregnancy reduced fetal movement sub optimally managed (9, 21). Due to this problem there is poor pregnancy outcome secondary to reduced fetal movement such as still birth, IUFD, low APGAR score within 5 minute after birth, increase CS rate and IOL and preterm birth. Multiple factors can decrease perception of movement, including early gestation, especially in null parity up to 28 weeks gestation (22) therefore I will include the study participants who has gestational age equal to or greater than 28 weeks. This study try to identify the determinant of the reduced fetal movements. This try to add some variables in addition to the previous variables study conducted in Ethiopia. Smoking, DM and anemia have association with RFM in other countries; so this research want to asses these variables in our country context.

1.3 Significance of the Study

Reduced fetal movements is one of the major danger sign during pregnancy that affects up to 15% of pregnancies and increase poor prenatal outcomes (9). So early detecting the determinant factors during antenatal care is a cost-effective way of preventing complications associated to the fetus, mother and reduce cost related healthcare.

The result of this study showed the determinant factors of reduced fetal movements; so this research increase awareness of health professional to give emphasis in early detecting determinant factors and awareness creation about reduced fetal movement to pregnant women.

The findings of this research will help for problem prioritizing and resource allocation, for formulation of prevention programs, follow up and proper care for pregnant mother with RFM. Moreover, this study serves as additional data source and plays a major role in adding valuable information for interested researchers and academicians for further analysis in the factors that associated with RFM.

2. Literature Review

2.1 Magnitude of Reduced Fetal Movement

A cohort study on perinatal outcomes of reduced fetal movements conducted in Ireland showed that following presentation with RFM, 26.5 % of women were admitted to hospital for further monitoring and management(8). Maternal perception of DFM is a common reason for women to make contact with their healthcare provider (22).

A retrospective cohort study conducted in UK indicated that reduced fetal movements, and recurrent episodes, are common, and lead to considerable resource usage and increases the admission rate pregnant women for induction of labor, caesarean section and other obstetric interventions (23).

The WHO recommendation (2018) and other studies indicated that fetal movement counting is a low-cost intervention on its own, but it could be resource-intensive if it leads to unnecessary additional interventions or prolonged hospitalization of women due to decreased fetal movement increase the burden on health professional and other resources (10, 24).

The study done in Sweden showed that increase the challenge from a clinical perspective is to inform pregnant women about fetal movements with the goal of minimizing unnecessary consultations whilst at the same time diminishing the length of pre-hospital delay if the fetus is at risk of fetal compromise. Pregnant women worry due to incidents related to changed pattern of fetal movements so women wanted that they consulted health care due to pain in relation to changed patterns of fetal movement, and wanting to be reassured that the fetus had not been damaged this increase the burden on all health care activity (25).

The study conducted in Stockholm and Sweden indicated that the absence of fetal movement among the study participants were 16 % and similar study conducted in Norway showed that 51 % of pregnant women concerned about decreased fetal movements once or more in pregnancy (25, 26).

A qualitative study in North-West of England indicated irrespective of information and advice given to pregnant women, 6–15 % present with concerns about RFM in late pregnancy (27).

A retrospective cohort study conducted in UK showed women presented with RFM during the month; using annual hospital birth figures, the incidence of RFM was estimated at 22.6% (23).

Case control study done in New Zealand indicated that maternal perception of decreases fetal movement were associated with stillbirth (17). Maternal perception of DFM is a common reason

for women to make contact with their healthcare provider. Multiple factors can decrease perception of movement, including early gestation, especially in null parity up to 28 weeks gestation (22).

A community based cross sectional study conducted in Shashamane town indicated that among the most commonly mentioned danger sign of pregnancy absent or decreased fetal movements account 38.6% (20).

A study done in Injibara about neonatal near miss indicated that women with reduced fetal movement during pregnancy showed almost six-times increased odds of neonatal near miss, as compared to mothers who did not perceive reduced fetal movement (11).

Studies done in different countries outside Ethiopia showed that smoking, DM and anemia have association with RFM but not assessed in Ethiopia; so this research include these variables.

2. 2 Determinant Factors of Reduced Fetal Movement

There are different determinants that increase the prevalence of reduced fetal movement and contribute for complications either for the mother or new born. These factors include; socio demographic, medical, behavioral and reproductive and obstetrics factors.

2.2.1 Socio-Demographic factors

Study done in USA showed that low socioeconomic status affects the quality of sleep in pregnant women during and after the third trimester of pregnancy, so this affects maternal perception of fetal movements (28).

Study done in UK showed Women with more than one episode of RFM were more likely to be younger as compared to older with one episode and presentations with decreased fetal movements (29, 30).

2.2.2 Reproductive and obstetric factors

A retrospective cohort study done in Israel revealed that nulliparous women (2.4%) and multiparous women (2.1%) complained of DFM (10).

A cohort study conducted in Ireland on Perinatal outcomes of reduced fetal movements showed that Women with RFM were more likely to be nulliparous (18). 1A retrospective cohort study conducted in UK showed that Women with more than one episode of RFM were more likely to be nulliparous (29). The study conducted in Ireland on risk factors for reduced fetal movements

in pregnancy indicated that women presenting with RFM during pregnancy are more likely to have an oligohydramnios and polyhydramnios (31).

Study conducted in Israel showed a significant association between the gestational age and decreased fetal movement (32). A cohort study done in Israel on reduced fetal movements at term, low-risk pregnancies: is it associated with adverse pregnancy outcomes, ten years of experience from a single tertiary center showed that nulliparity associated with RFM (33).

Study done in UK showed Women with more than one episode of RFM were more likely to be younger, nulliparous, and had a higher IOL rate as compared to those with one episode and presentations with decreased fetal movements (29, 30).

A cross sectional study conducted in India on Knowledge regarding fetal movement monitoring among pregnant women attending ANC and OPD in a tertiary care center showed that even though the women completed secondary level of education 33% of the antenatal women had poor knowledge regarding fetal movement monitoring (34).

A prospective cohort study conducted in India revealed that Significant proportions 70%) of women had no understanding of what is meant by reduced fetal movements (35).

A qualitative study in North-West of England indicated that women were between 20 and 40 weeks of pregnancy at the time of experiencing RFM and had waited between 6 h and 2 weeks after experiencing RFM before contacting a healthcare professional (17).

A cross sectional study conducted in Beninin and Nigeria showed that the 53% of the women demonstrated poor knowledge of decreased fetal movement and 21.8% were concerned about reduction in the movement of the fetus in the last trimester of pregnancy (36).

The study done in Shashemene showed respondents who attended antenatal care were 1.26 times more likely to have good knowledge of obstetric danger signs (reduced fetal movement) than those who had no antenatal care. In this study respondents who gave birth at health center were 3.57 time more likely to have good knowledge of reduced fetal movement than those who gave birth at home (20). Case control study done in Injibara revealed that impending preterm labor, preeclampsia /eclampsia, oligohydramnios and post term pregnancy (gestational age > 42weeks) were significantly associated with reduced fetal movement (9).

2.2.3 Medical factors

A study done in Australia on decreased fetal movements showed that there was association between perceived decreased fetal movement (DFM) and maternal factors such as the presence

of diabetes (22). The study conducted in Paris and Saudi Arabia on the effect of anemia on fetal movements revealed that there was association between anemia during pregnancy and decreased fetal movements(37, 38).

2.2.4 Behavioral factors

Studies done in UK, Ireland and Sweden on risk factors for reduced fetal movements in pregnancy showed that women with RFM were more likely to be smokers (29, 30).

Generally, as illustrated on different studies, determinants factors associated with reduced fetal movements(RFM) are grouped into four categories: socio-demographic factors, reproductive & obstetric factors, medical factors and behavioral factors as depicted in the conceptual framework below.

2. 3 Conceptual Frame work

The following diagram is developed from different literature and it shows distinct dimensions of determinants associated with RFM (9, 10, 23).

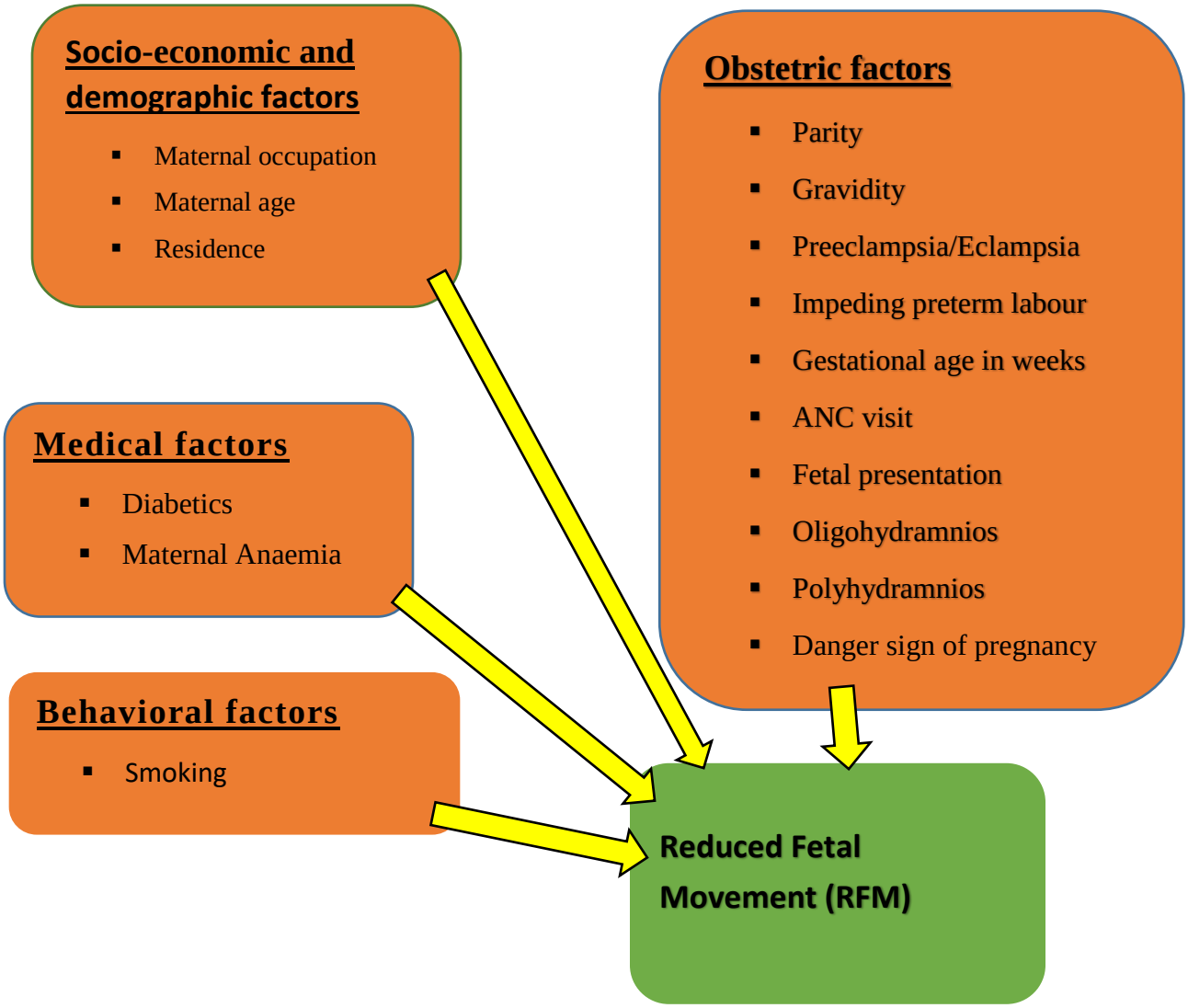

Figure 1*:* Conceptual framework of determinants of reduced fetal movement adapted from literature review among pregnant women attended at North Shoa zone hospitals, Amhara region, Ethiopia

3. Objective of the Study

To assess determinants of Reduced Fetal Movement among women followed in Government Hospitals, in North Shoa Administration Zone, Amhara National Regional State, Ethiopia, 2021.

4. Methods and Materials

4. 1 Study Area

The study was carried out in North Shoa zone administration government hospitals. North Shoa Zone administration is one of the 11 Zones in Amhara National Regional State and has a total of 28 rural districts and 3 town administrations. The Zone is bordered in the south and west by the Oromia National Regional state, in the North by South Wollo Zone administration, in the northeast by the Oromia Zone administration, and in the east by the Afar National Regional State. The zone has one comprehensive specialized hospital, two general hospitals, two private hospitals, 7 primary hospitals, 164 private clinics, 97 governmental health centers and 391 health posts.

The population of the zone is now estimated to reach 3,500,000; along with the entire population of Ethiopia it has more than doubled since 1994(1560916) and the population is predominately Ethiopian Orthodox Christian(39).

4.2 Study Design and Study Period

Institution based unmatched case control study was conducted in North Shoa Zone administration, Amhara national regional state in government hospitals among mothers who came for ANC, labor and delivery ward follow up from April, 1 to May, 30, 2021

4.3 Population

4.3.1. Source Population

Cases

Cases were all pregnant women at or beyond 28 weeks of gestation presenting with at least a subjective perception of RFM followed in government hospitals in North Shoa zone administration.

Controls

Controls were all pregnant women at or beyond 28 weeks of gestation presenting without perception of RFM followed in government hospitals in North Shoa zone administration

4. 3.2. Study Population

Cases

Cases were all pregnant women at or beyond 28 weeks of gestation presenting with at least a subjective perception of RFM followed in randomly selected government hospitals in North Shoa zone administration.

Controls

Controls were all pregnant women at or beyond 28 weeks of gestation presenting without perception of RFM followed in randomly selected government hospitals in North Shoa zone administration.

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

Cases

- All pregnant women with at least complain of RFM greater than gestational age or equal to 28 weeks who attended at ANC and labor &delivery in government Hospitals in North Shoa administrative zone during the study period were included.

Controls

- All pregnant women without perception of RFM greater than gestational age or equal to 28 weeks who attended at ANC and labor &delivery in government Hospitals in North Shoa administrative zone during the study period were included.

4.4.2 Exclusion criteria

Cases

All pregnant women with RFM and gestational age less than 28 weeks, diagnosed as having congenital anomalous, multiple pregnancy and severely ill mothers who attend at ANC, labor &delivery in government Hospitals in North Shoa administrative zone during the study period will be excluded.

Controls

All pregnant women without perception of RFM and gestational age less than 28 weeks diagnose as having congenital anomalous, multiple pregnancy and unable to respond the questionnaire who attend at ANC, labor &delivery in government Hospitals in North Shoa administrative zone during the study period were excluded

4. 5 Sample Size determination

The sample size was calculated by using EPINFO 7 STAT calc. The required sample size was calculated by using two population proportions formula. In this regard, a 5% level of significance (two-sided) or the hypothesis of no significant difference, a power of 80% and a one to two allocation ratio of RFM to non-RFM (1:2) was assumed. Among determinant factors for RFM

taken from a literature, gestational age in weeks was taken as major determinant factors (9). The proportion gestational age in weeks less than 37 week at all among controls to be 8.4 % and cases to be 31.57 %, detect an odds ratio of 5.02 from the least significantly associated factor. Based on the above assumptions, the sample size was 116. Therefore, Total sample size with 10% of non-response rate was 129(43 cases and controls 86).

Table 1: Sample size calculation based on variables for the study among women followed and delivered in government hospitals in North Shoa zone administration, Amhara national regional state, Ethiopia, 2021

Variables	Power	Level of significance	% case exposed	% control exposed	Ratio	Sample size	Reference
Preeclampsia	80%	95%	38.9	10.5	2	90	(9)
Oligohydramnios	80%	95%	29.5	5.3	2	96	
Gestational Age in weeks	80%	95%	31.6	8.4	2	**116**	

4. 6 Sampling techniques and procedure

Five government hospitals were selected by using simple random sampling technique.

The required sample size was allocated proportionally to five government hospitals.

To get the individual participants for control at each hospitals systematic random sampling was conducted by the total number of pregnant women come for ANC, labor & delivery ward during the study period to number of samples required for each hospital. Then after sampling fraction was gotten the first participant was selected by lottery method to know the first participant come to ANC, labor & delivery ward to selected control.

To select Cases in each hospital all mothers who fulfil inclusions criteria for RFM was include in the study during data collection period until the sample size required was fulfilled.

The sample size of 129 women (43 cases and 86 controls) was achieved within a period of 2 months .For each case, two controls was selected on the same day, By checking in the antenatal

register who have RFM was selected for case then the next registered pregnant woman have no RFM was taken as the control every Kth interval.

The 10 government hospitals in north shoa zone were stratified based on the service they provide (specialized, general, primary hospitals).

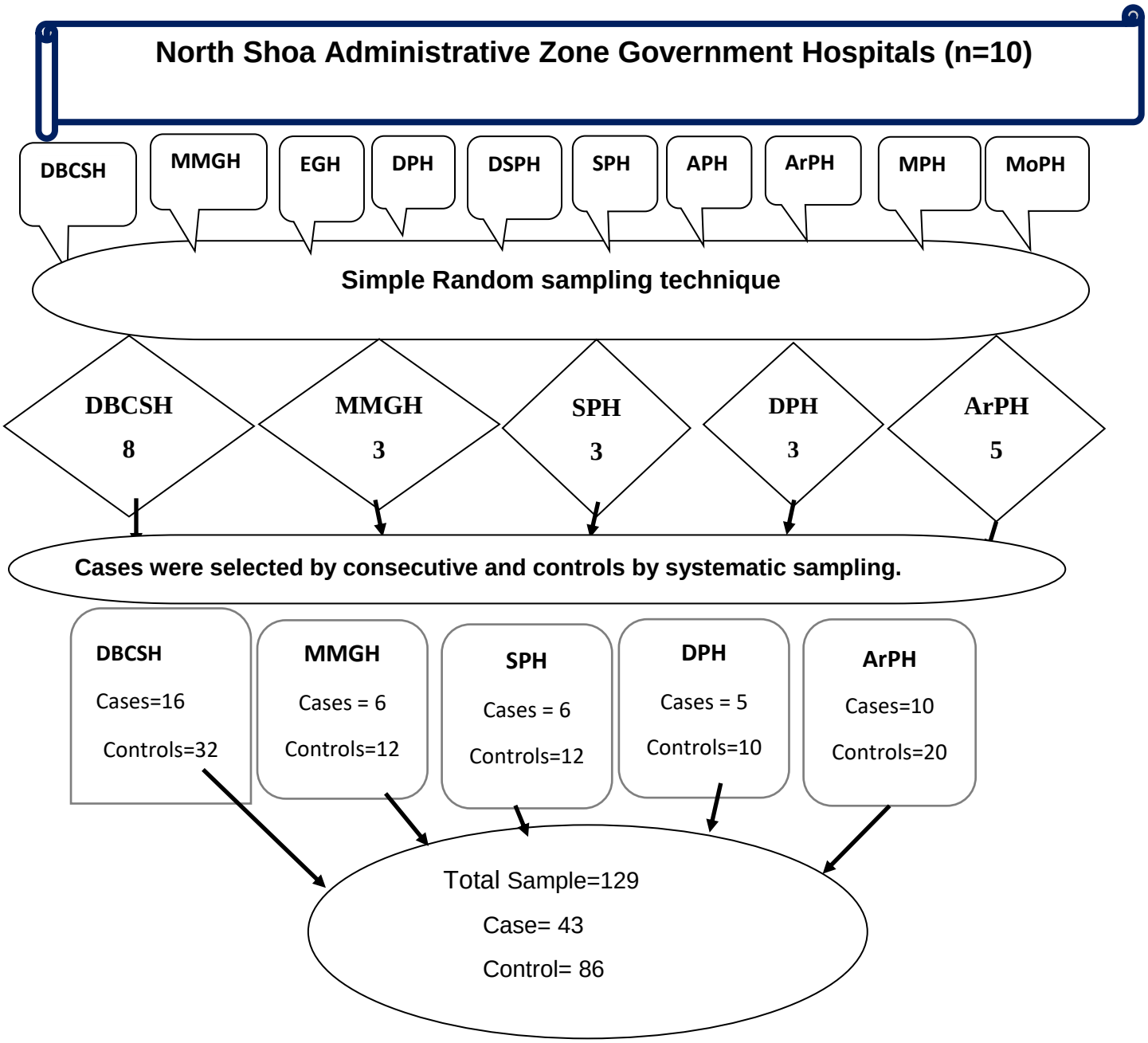

Figure 2: Schematic presentation of the sampling procedure to assess determinants of reduced fetal movement among women followed in government hospitals, in North Shoa Administrative zone, Amhara national regional state, Ethiopia, 2021

4. 7 Data collection procedures

The questionnaire used in the study was developed based on the literature review (8-10). The data was collected by using pre tested interviewer-administered semi structured questionnaire and using chart review. These questionnaires use comprises 21 items with 5 item for socio-demographic, 13 item for obstetric characteristics, 2 item for medical factors and 1 item behavioral factors in the form that it was answered the study objective. Then the data was collected by one midwife and one midwife team leader for supervisor for each hospital.

4.8. Variables

4.8.1 Dependent Variables

- Reduced fetal movement (yes/no)

4.8.2 Independent variables

- **Socio-economic and demographic factors**
  - Maternal age,
  - Religion
  - Maternal educational level
  - Maternal occupation,
  - Residence,
- **Obstetric factors**
  - Gestational age in weeks
  - Gravidity
  - Parity
  - Preeclampsia/eclampsia
  - Fetal presentation
  - Impeding preterm labor
  - Oligohydramnios
  - Polyhydramnios
  - ANC visit

- Danger sign of pregnancy

- **Medical factors**
  - Maternal anemia
  - Diabetics
- **Behavioral factors**
  - Smoking,

4.9 Operational Definition

Reduced Fetal Movement: Reduced Fetal Movement is a maternal perception of reduced or absent fetal movements.

Cases: The cases are pregnant women with gestational age ≥28 weeks with reduced fetal movement.

Controls: The controls are pregnant women with gestational age ≥28 weeks who do not have reduced fetal movements.

4.10 Data Quality Assurance

The quality assurance of the study was started at the very beginning of study instrument development. Questionnaire was translated to Amharic language and back to English for its consistency. Five diploma midwives were used for data collectors; five-degree midwives' supervisors were assigned. Before actual data collection, the data collectors were trained and had a similar concept on the questionnaire. The questionnaire was tested by pretest to identify errors and modify it. Throughout the course of the data collection, interviewers were supervised and regular meetings were held between the data collectors, supervisor and the principal investigator together in which problematic issues arising from interviews that are discussed and addressed. The collected data was reviewed and checked for completeness before data entry. Double entry was used to assure the quality, data entry and analysis software was checked with first few collected data to assess the correctness of the prepared template and weather it process what was wanted.

Pre-test study

A pre-test study was conducted before data collection on 13 clients that is 10% of sample size in Debresina hospital**;** based on the pretest result, a questionnaire was corrected to ensure clarity, wording, and logic sequence and skip patterns.

4. 11 Data Processing, Analysis and Interpretation

The collected data was entered for cleaned, coded and checked by using Epi-Data version 3.1 and then exported to SPSS version 23 for analysis. Different frequency tables and descriptive summaries were used to describe the study variables. Bivariate analysis was executed and all variables with p-value <0.25 were entered into multivariable logistic regression. Multi co-linearity test as carried out to see the correlation between independent variables. Before farther interpretation model adequacy was checked using Hosmer and Lemeshow goodness of the fit stastical method and the result showed that p-value of the model fitness Test as 0.259. Finally, multivariable logistic regression analysis was used to identify independent predictors of reduced fetal movement. P-value of less than 0.05 at 95% CI was considered as statistically significant association.

4. 12 Ethical Consideration

Ethical clearance was obtained from the research ethical review board of College of Health Science of Debre Birhan University. Informed written consent was obtained from all participants before data collection and confidentiality was maintained by anonymous recording and coding. Interview was conducted in the quit area, enclosed whenever possible to protect the study participants' privacy. In order to protect the study participants' identities, each participants were given the unique identification code, which was checked before transcription of the data.

4.13 Dissemination of Results

Result of the study will be disseminated to the Department of Public Health, College of Health Sciences, Debre Birhan University and other responsible bodies; and it will be presented in different seminars, meetings and workshops. Finally, the findings will be sent for publication and dissemination through different journals and scientific publications.

5. Result

5.1 Socio-Demographic factors

A total of 129 study participants were included in the study with a response rate of 100%. The mean age of cases was 28.8 years with a standard deviation±5.276 years and controls was 27.99(SD ±5.19) years.

Majority (93%) and (89.5%) of the cases and controls respectively were married. Thirty five (81.4%) of cases and 73(84.9%) controls were orthodox Christian. Thirteen (30.2%) of cases and 30(34.9%) of controls attended primary education. Regarding to occupational status 24(55.8%) of cases and 49(57%) of controls were housewife. Around 67.4% of cases and 60.5% of controls have lived in urban.

Table 2: Socio-economic and demographic characteristics of the participants (n = 129) in government hospitals, North Shewa zone, Northeast Ethiopia, 2021.

CHARACTER	CATAGORIES	CASE Frequency (%)	CONTROL Frequency (%)
Age category	15-19	2(4.7)	4(4.7)
	20-24	8(18.6)	21(24.4)
	25-29	14(32.6)	30(34.9)
	30-34	14(32.6)	18(20.9)
	>=35	5(11.6)	13(15.1)
Marital status	Married	40(93)	77(89.5)
	Others	3(7)	9(10.5)
Religion	Orthodox	35(81.4)	73(84.9)
	Muslim	7(16.3)	9(10.5)
	Others*	1(2.3)	4(4.7)
Educational status	illiterate	9(20.9)	21(24.4)
	Able to read	5(11.6)	6(7)
	Primary(1-8)	13(30.2)	30(34.9)
	Secondary(9-12)	3(7)	11(12.8)
	Higher education	13(30.2)	18(20.9)
occupational status	Housewife	24(55.8)	49(57)
	Merchant	5(11.6)	17(20)
	Civil servant	14(32.6)	20(23)
Residence	Urban	29(67.4)	52(60.5)
	Rural	14(32.6)	34(39.5)

* Religion include protestant and catholic

5. 2 Obstetric factors

Twenty two (51.2%) of cases and 42(48.8%) of controls were having a term pregnancy (37- 42 weeks). Thirty eight (88.4%) of cases and 63(73.3%) of controls had previous antenatal care

visit. Regarding to frequency of ANC visit 18(41.9%) of cases and 33(38.4%) of controls had 3 ANC visits.

Regard to information of pregnancy danger signs, 29(67.4%) of cases and 34(39.5%) of controls had information on danger signs of pregnancy. Around (37.2%) of cases and (12.8%) of controls had preeclampsia/eclampsia and impeding preterm labor was 1(2.3%) in cases. 13(30.2%) in cases and 9(21%) in controls were oligohydramnios. Two (4.7%) of cases and 3(3.5%) of controls were polyhydramnios. Twenty eight (65%) of cases and 39(45.3%) of controls were Primi gravida whereas 27(62.8%) of cases and 40(46.5%) of controls were null para.

Table 3: Obstetric characteristics of the participants in government hospitals, North Shewa zone, Northeast Ethiopia, 2021.

CARACTER	CATEGORIES	CASE Frequency (%)	CONTROL Frequency (%)
Gestational age in weeks	28-36 week	10(23.2)	35 (40.7)
	37-42 week	22(51.2	42 (48.8)
	> 42 week	11(25.6)	9 (10.5)
Antenatal care visit	yes	38(88.4)	63 (73.3)
	no	5(11.6)	23 (26.7)
Frequency of ANC visit	0	5(11.6)	23 (26.7)
	1	3(7)	5 (5.8)
	2	11(25.6)	17 (19.8)
	3	18(41.9)	33 (38.4)
	4	6(14)	8 (9.3)
Information on Danger sign of pregnancy	yes	29(67.4)	34(39.5)
	no	14(32.6)	52 (60.5)
Preeclampsia/eclampsia	yes	16(37.2)	11 (12.8)
	no	27(62.8)	75 (87.2)
Fetal presentation	Cephalic	40(93)	83 (96.5)

	Breach	3(7)	2 (2.3)
	Shoulder	0(0)	1 (1.2)
Impeding preterm labour	yes	1(2.3)	0(0)
	no	42(97.7)	86 (100)
Oligohydramnios	yes	13(30.2)	9 (21)
	no	30(69.8)	77 (79)
Polyhydramnios	yes	2(4.7)	3 (3.5)
	no	41(95.3)	83 (96.5)
Gravidity category	primi gravida	28(65)	39 (45.3)
	multi giravida	15(35)	47 (54.7)
Parity category	Nully para	27(62.8)	40 (46.5)
	Primi para	7(16.3)	26 (30.2)
	Multi para	9(20.9)	20 (23.3)

5. 3 Medical factors

Eight (18.6%) of the cases and 8(9.3%) of the controls were anemic. Regarding to diabetics mellitus, 2(4.7%) of the cases and 2(2.3%) of the controls had history of the DM.

Table 4: Medical factors of the participants in government hospitals, North Shewa zone, Northeast Ethiopia, 2021

CARACTER	CATEGORIES	CASE Frequency (%)	CONTROL Frequency (%)
Anemia	yes	8(18.6)	8(9.3)
	no	35(81.4)	78(90.7)
Diabetic	yes	2(4.7)	2(2.3)
	no	41(95.3)	84(97.7)

5. 4 Behavioral factors

Regarding to the behavioral characteristics of the study participants 1 (2.3%) of the cases and 1(1.2%) of the controls were smokers.

5. 5 Bivariate and Multivariate Analysis

Determinants of reduced fetal movement (RFM)

By binary logistics regression analysis; educational status, occupational status, gestational age in weeks, ANC visit, ANC visit frequency, knowledge about obstetrics danger signs during pregnancy, preeclampsia, oligohydramnios, gravidity and anemia were significantly associated with reduced fetal movements at p-value < 0.25 and these variables were entered in to the multivariable analysis.

In the multiple logistic regressions analysis post-term pregnancy (GA >42 weeks), preeclampsia and oligohydramnios were identified as obstetric determinant factors for reduced fetal movements ; while anemia was identified as medical related determinant factors of reduced fetal movements (Table 5).

Pregnant women with gestational age >42 weeks were having more than five times increased odds of reduced fetal movement than pregnant women with gestational age 28-36 weeks (AOR = 5.48, 95% CI=1.12-26.76). Pregnant women who had preeclampsia were almost five times more likely to develop reduced fetal movements than pregnant women who had no preeclampsia (AOR =4.90, 95% CI= 1.64-14.67). Oligohydramnios women were having nearly five times increased odds of reduced fetal movements as compared to pregnant women who had normal amniotic fluid (AOR= 4.71, 95% CI= 1.27-17.48). Primi gravida were four times increase the odds of reduced fetal movements (AOR =4.31, 95% CI=1.38-13.45) as compared to multi gravida. Anemia was the determinant factors of reduced fetal movements. Anemia was four times increase the odds of reduced fetal movements (AOR= 4.04 95% CI= 1.07 -15.34) than non-anemic pregnant women.

***Table 5*: Bivariate and multivariate regression of determinants of reduced fetal movements in government hospitals in North Shoa Zone, Amhara national regional state, Ethiopia, 2021.**

Character	Categories	Case	Control	COR(95%CI)	P-Value	AOR	P-Value
Educational status	Illiterate	9	21	.593(.206-1.709)	.334	1.105(0.059- 20.561)	.947
	Able to read	5	6	1.154(.289-4.608)	.839	1.881(0.085- 41.461)	.689
	Primary (1-8)	13	30	.600(.228-1.576)	.300	1.371(0.087-21.719)	.823
	Secondary(9-12)	3	11	.378(.087-1.630)	.192	.910(.029-28.827)	.957
	Higher education	13	18	1.000		1.000	
occupational status	Housewife	24	49	.700(.302-1.620)	.405	.740(.032-17.363)	.852
	Merchant	5	17	.420(.125-1.407)	.160	.147(.005-4.337)	. .267
	Civil servant	14	20	1.000		1.000	
Gestational age in weeks	28-36 weeks	10	35	1.000			
	37-42 weeks	22	42	1.833(.767-4.384)	.173	2.578(.760-8.752)	.129
	>42 weeks	11	9	4.278(1.386 - 13.202)	.011	5.480(1.122 -26.756)	**.035***
Had ANC visit	Yes	38	63	1.000		1.000	
	No	5	23	.360(.126-1.027)	.056	1.684(.532-5.334)	.376
Frequency of ANC visit	0	5	23	.290(.069-1.216)	.090	1.094(.188-6.382)	.920
	1	3	5	2.760(.491-	.249	4.727(.469-	.188

				15.529)		47.679)	
	2	11	17	2.976(.815-10.173)	. 082	4.116(.629-26.945)	.140
	3	18	33	2.509(.822-7.727)	.109	1.304(.244-6.965)	.756
	4	6	8	1.000		1.000	
danger sign of pregnancy	Yes	29	34	3.529(1.616-7.709)	.002	.474(.160-1.399)	.176
	No	14	52	1.000			
Preeclampsia	Yes	16	11	4.040(1.668-9.788)	.002	4.901(1.637-14.67)	**.004***
	No	27	75	1.000			
oligohydramnios	Yes	13	9	4.504(1.824-11.121)	.001	4.709 (1.269-17.477)	**.010***
	No	30	77	1.000			
gravidity category	Primi gravida	28	39	2.250(1.055 - 4.797)	.036	4.314(1.383-13.449)	**.012***
	Multi gravida	15	47	1.000		1.000	
Anemia	Yes	12	8	3.774(1.407-10.123)	.008	4.042(1.065 -15.339)	**.020***

**Note *** =p< 0.05 significantly associated with RFM Hosmer and Lemeshow Test multivariable logistic regression p-value =0.259

6. Discussion

This study determine and analyzed the determinants of reduced fetal movement among mothers followed up in government hospitals of north Shoa zone, Amhara region. Overall, this study

revealed that the determinants of reduced fetal movement were post term pregnancy, preeclampsia/eclampsia, oligohydramnios, Primi gravida and anemia.

The finding of this study showed that the odds of reduced fetal movement was increased 5 times in post term pregnancy ; which is consistent with the study conducted in Ethiopia Injibara hospital, United Kingdom and Israel (9, 32, 40). The reason for this could be because of reduction of amount of amniotic fluid after 40 weeks of gestational age and utero-placental insufficiency, meconium aspiration; this affects the integrity of the central nervous and musculoskeletal system.

This study also revealed that preeclampsia/eclampsia is the determinant factors of reduced fetal movements. Preeclampsia/eclampsia increase five times the odds of reduced fetal movement) than non preeclamtic women. This is in line with the study done in Injibara(9).

This is might be because of the effect of utero-placental insufficiency secondary to placental dysfunction or ischemia due to the failure of the maternal arteries supplying oxygen and nutrient to placenta. Supported findings revealed that placental blood flow perfusion in patients with pre-eclampsia/eclampsia had a lower placental vasculature secondary to reduced surface area of placenta as compared to non-preeclampsia women (41).

The odds of reduced fetal movement with oligohydramnios was five times higher than the pregnant women who had normal amniotic fluid, this might be due to the effect of oligohydramnios on cord compression, fetal acidosis, meconium stained amniotic fluid and hinders free movement of the fetus. Similar finding in Ethiopia Injibara hospital showed that fetal movements were directly related with the reduction of amniotic fluid volume(9). This is might be due to the fetus movement decrease in oligohydramnios secondary to increased flexion of fetal spine, which is likely due to reduced uterine volume. This could lead to the development of fetal lung hypoplasia, fetal immobility and other fetal anomalies(42).

The result of this study revealed that reduced fetal movements were 4 times higher in primi gravida than multi gravida; which is similar with the case control study conducted in Israel and Ireland (9, 10, 16). This might lack of experience or poor knowledge to appreciate fetal movement.

The finding of this study indicated that anemia was the determinant factors of reduced fetal movements. Anemia increases 4 times the odds of fetal movements as compared to non-anemic pregnant women. This might be due to placental insufficiency of nutrient and oxygen in pregnant

women that decrease fetal musculoskeletal system activity(17). Anemia affects the function of muscle, the ability to exercise and gut function or if the iron level decreased in blood of fetus oxygen consumption decreased this lead to growth retardation and weak muscle activity(38).

7. Strength and Limitations of the study

7. 1 Strength of the study

It use two data sources

7.2 Limitation of the study

The finding of this study is facility based it may lacks generalization to all pregnant.

The outcome variables depend on the study participant's memory (recall bias).

8. Conclusion

Reduced fetal movements were associated with various determinant factors that increase perinatal and maternal mortality. Factors like; post term pregnancy, preeclampsia,

oligohydramnios, primi gravida and anemia were determinant factors of reduced fetal movements.

Closely follow up and immediate intervention needed to decrease adverse effect secondary to reduced fetal movement.

9. Recommendation

Zonal Health Office

It should give emphasis on the need for continued research, education and training in the identification, investigation and management of RFM. Further research is needed to clarify optimum management strategies to optimize determinants of RFM.

Hospitals

Reduced fetal movement is an important part of assessment in antenatal care, so hospitals should examine the management approach to determinant factors of RFM within their services. Improving the consistency and standard of information about DFM provided to pregnant women and their clinicians, is likely to lead to earlier identification of higher-risk pregnancies, timely intervention and reduction of bad outcome secondary to determinant factors of RFM.

Health professionals

It is better to give emphasis on determinants of reduced fetal movements, health education and creating awareness the importance of ANC services as well as advice pregnant women what to do when fetal movement decreased/stop.

Researchers

Rigorous research should be conducted to develop and test screening tools which identify 'at-risk' pregnancies on the basis of fetal movement.

High-quality, randomised controlled trials are needed to determine appropriate intervention strategies for women with RFM.

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11. Appendix

Annex 1: Information Sheet

Title of the Research Project: Determinants of Reduced fetal movement among pregnant women followed in government hospitals, in North Shoa administrative zone, Amhara national regional state, Ethiopia, 2021.

Name of Principal Investigator: Abebaw Alemayehu

Name of the Organization: Debre Birhan University, College of Health Science,
Department of Public Health

Name of the Sponsor: Self sponsor

Information Sheet is prepared for participants who have included in the study during data collection.

Introduction

This information sheet is prepared with the aim of assessing determinants of reduced fetal movement among women followed in government hospitals, in North Shoa administrative zone, Amhara national regional state, Ethiopia, 2021.

Purpose of the Research Project: The aim of this study is to assess determinants of reduced fetal movements among women followed in government hospitals, in North Shoa administrative zone, Amhara national regional state, Ethiopia, 2021. The results of this study will be used to design appropriate intervention programs to address the problems related to reduce fetal movement in North Shoa Administrative Zone, Amhara National Regional state, Northeast Ethiopia.

Procedure: The study involves pregnant women followed in selected government hospitals and had fulfilled the inclusion criteria of determinant of reduced fetal movement, in North Shoa Administrative Zone, Amhara national regional state, Ethiopia, 2021

You are selected to be one of the study participants if you are willing to take part in this study and I kindly invite you to take part in my project. If you are willing to participate, I am so happy and I need you to clearly understand the aim of this study and show your agreement. Finally, you are kindly requested to give your genuine response in the interview.

Benefits, Risk and /or Discomfort

By participating in this research project you may feel some discomfort in wasting your time (a maximum of 30 minutes).

However, your participation is definitely important to identify the reduced fetal movement and its determinant among pregnant woman followed in governmental hospitals, in North Shoa administrative zone, Amhara national regional state, Northeast Ethiopia, 2021

There is no risk or direct benefit in participating in this research project.

Incentives/Payments for Participating

You will not be provided any incentives or payment to take part in this project.

Confidentiality

The information collected from you will be kept confidential and stored in a file, without your name by assigning a code number to it. Hence, no report of the study ever identifies you.

Right to Refusal or Withdraw

You have the full right to refuse from participating in this research. You have also the full right to withdraw from this study at any time you wish.

Person to contact

This research project will be reviewed and approved by the ethical committee of Debre Birhan University, College of Health Sciences. If you have any question you can ask any time.

Name of contact person: Abebaw Alemayehu

Tele: (+251)912490367

E-mail: bayilabebaw@gmail.com

Annex 2: Consent Form

Introduction

Good morning/afternoon, my name is _____I am Reproductive Health master student in Debre Birhan University. I am studying determinants of reduced fetal movement among pregnant woman followed in governmental hospitals, in North Shoa administrative zone, Amhara national regional state, Ethiopia, 2021. Your truth full answers for all of my questions about determinant factors associated with reduced fetal movement will be very important. Your answers will be confidential and secret. If you decide that, you do not want to participate in the

study, or that decide at any time in the future you do not want to participate. I appreciate if you try to answer all the questions. If you agree to participate, we will go 30 minutes for us to complete the questionnaire. If you have any questions about the study, you can ask.

Thank you. Next, I will read a consent, which assures your interest to participate.

The researcher explained the aim of the study. Moreover, to decide any time if I do not want to participate. Therefore, I assure that my interest to participate in this study is truly from my knowledge.

If client refuses, please check this box

Signature of Person administering consent_____

Date_____

Client's Signature_____ Husband/other family signature_____

Date_____

Identification number: _____

Data collector (Name & Number): _____

Annex 3: English Questionnaires

The questioners contain four parts

Date of interview_____

Participant's code: _____

MRN No: ____

Instruction: Indicate the answer by encircle the number which contains the correct answer.

Part I: Socio-demographic characteristics

No	Question and Filters	Coding Categories	Skip to

	Do you feel fetal movement	1. Yes 2. No	
101	How old are you now?	_____ years	
102	What is your marital status?	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated	
103	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others(specify)_____	
104	What is your Residence?	1. Urban 2. Rural	
105	What is your educational status?	1. Unable to read and write 2. Able to read and write 3. Primary (1-8) 4. Secondary (9-12) 5. Higher education	
106	What is your occupational status?	1. Housewife 2. Merchant 3. Civil servant 4. If other(specify)_____	

Part II: Reproductive and Obstetrical related factors

NO	Questions	Coding Categories	
201	How many times you become pregnant?	_____ times	
202	What is the gestational age in weeks	_____ weeks	

203	How many children delivered?	_____ children	
204	Have you ever had ANC visits?	1. Yes 2. No	
205	If yes for Q 204, how many times?	_____ times	
206	Did you know danger sign of pregnancy?	1. Yes 2. No	
207	If yes for Q 206, what are they?	_____	
208	Have you ever had experience of preeclampsia/eclampsia?	1. Yes 2. No	
207	What is the Fetal presentation	1.Cephalic 2. Breach 3.Sholder	
208	Have you experience impeding preterm labour	1. Yes 2. No	
209	Has she Oligohydramnios	1. Yes 2. No	
210	Has she Polyhydramnios	1.Yes 2. No	

Part III: Medical factors

NO	Questions	Coding Categories	
301	Have she anemia	1. Yes 2. No	
302	Is she diabetic	1. Yes 2. No	

Part IV: Behavioral factors

NO	Questions	Coding Categories	
301	Have you smoke?	1. Yes 2. No	

Annex 4፡ የአማርኛ ቅጅ መጠይቆች

ለተሳታፊዎች ጠቅለል ያለ መረጃ

እንደምን አደሩ/ ዋሉ ስሜ _____ እባላለዉ. በደብረ ብርሃን ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ በማህበረሰብ ጤና ትምህርት ክፍል ውስጥ የማስተር ተማሪ ነኝ. በሰሜን ሸዋ አስተዳደር ዞን በመንግስት ሆስፒታል ውስጥ ክትትል ያላቸው እናቶች እና ተያያዥነት ያላቸውን ሁኔታዎች በጤና ተቋም ውስጥ ለማጥናት ስለፈለጉ ለደንበኞች ቃለ መጠይቅ እያደረኩ ነው.

የፈቃድ ፎርም

ቃለ መጠይቁ በርስዎ ተሞልቶ የሚጠናቀቅ ነዉ. ለጥናቱ ትክክለኛ እና የተፈለግዉን ዓላማን እንዲያመጣ የርስዎ ታማኝ እና ትክክለኛ መልስዎ ትልቅ ዋጋ አለዉ. በተጨማሪም እርስዎ በዚህ ጥናት ላይ በፍቃደኝነት መሳተፍዎ የፅንስ እንቅስቃሴ የሚቀነሰባቸው ምክንያቶችን የበለጠ ግንዛቤ እንዲኖረን ይረዳናል. እነዲሁም ከተለያዩ የባለድርሻ አካላት ጋር በመሆን የእናቶች እና የህጻናትን ጤና ለማሻሻል ይረዳል.

በማንኛውም መጠይቅ ቅጽ ላይ ስምዎ አይጻፍም ለማንም ሰው አይነገርም የእርስዎ ምላሾች በሙሉ ሚስጥራዊ ናቸው. መልስ ለመስጠት የማይፈልጉትን ማንኛውም ጥያቄ መልስ መስጠት አያስፈልግዎትም. የዚህ ጥናት ስኬት በእውነተኛ ምላሽዎ ላይ የተመሰረተ ነው. ስለዚህ አስቀድሜ አመሰግናለሁ.

በጥናቱ ለመካፈል ፈቃደኛ ነዎት? አዎ ..... የለም_____ አዎ ከሆነ √ ምልክት ያድርጉ.

የስምምነት ቅፅ

በጥናቱ ለሚሳተፉ የስምምነት ውል፡

ጤና ይስጥልኝ እኔ---------- እባላለሁ፡፡በደብረ ብርሃን ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የሁለተኛ ዲግሪ ተማሪ ስሆን በሰሜ ሸዋ አስተዳድር ዞን ባሉ የመንግስት ሆስፒታል ውስጥ ክትትል ያላቸው እናቶች እና ተያያዥነት ያላቸውን ሁኔታዎች በጤና ተቋም ውስጥ ለማጥናት ስለፈለኩ በዚህ ጥናት ለመሳተፍ የእርሰዎ ሙሉፈ ቃደኝነት ያስፈልጋል፡፡ ይህ ጥናት በጥናቱ ተሳታፊዎች ላይ ምንም ዓይነት ጉዳት የማያስከትልና የጥናቱ ተሳታፊዎች የሚሰጡት መረጃ ምስጢራዊነቱ የተጠበቀ ነው፡፡ መረጃው

የሚያገልግለው ለዚህ ጥናት ብቻ ሲሆን ተሳታፊዎች በማንኛውም ጊዜና ሰዓት ጥናቱን ካልፈለጉ የማቋረጥና ያለመሳተፍ ሙሉ መብት አላችሁ። የጥናቱ ተሳታፊዎች የምትሰጡት መረጃ ለጥናቱ እጅግ በጣም ጠቃሚና ወሳኝ በመሆኑ የጥናቱን ዓላማ ለማሳካትና የውሳኔ ሐሳብ በማመንጨት ለሀገር ከፍተኛ ጠቀሜታ ይኖረዋል። በጥናቱ ላይ የምታነሱት ጥያቄ ወይም ያልገባዎት ነገር ካለ መጠየቅ ይችላሉ።ተጨማሪ ጥያቄ ካለዎት በማንኛዉም ጊዜ በሚቀጥለዉ ስልክ ማግኘት ይችላሉ፡

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እርሰዎ በዚህ ጥናት ላይ ለመሳተፍ ፈቃደኛነዎት?

አዎን፡- ወደ ቃለ መጠይቁ ይሂዱ።

አይደለሁም፤አመሰግናለሁ።ወደ ሚቀጥለው ተሳታፊ ይሂዱ።

የቃለ መጠይቅ አቅራቢው ስም _____ ፊርማ _____

የህክምና መዝገብ ቁጥር----------

መለያ ቁጥር---------

ቃለ መጠይቅ የተደረገበት ቀን _____

ክፍል አንድ፡ ማህበራዊ ጉዳዮችን የሚዳስሱ ጥያቄዎች

ተ.ቁ	መጠይቆች	አማራጭ መልሶች	ምርመራ
101	እድሜሽ ስንት ነው?	_____ ዓመት	
102	የጋብቻ ሁኔታ	1. ያላገባች 2. ያገባች/ባለትዳር/ 3. የፈታች	

		4. ባሏ የሞተባት 5. የተለያዩ	
103	ሃይማኖትሽ ምንድን ነው?	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ይግለጹ_____	
104	የትምህርት ደረጃሽ?	1. ማንበብ እና መፃፍ የማትችል 2. ማንበብ እና መፃፍ የምትችል 3. 1ኛ ደረጃ (1-8) 4. ሁለተኛ ደረጃ (9-12) 5. በማዕረግ የተመረቀች	
105	ስራሽ ምንድን ነው?	1. የቤት እመቤት 2. ነጋዴ 3. መንግስት ሠራተኛ 4. አርሶ አደር 7. ሌላ ካለ_____	
106	የት ነው የምትኖሪው?	1. ከተማ 2. ገጠር	

ክፍል ሁለት፡ የሥነ-ተዋልዶ ጤናን እና ከእርግዝና ጋር ከተያያዙ ነገሮችን በተመለከተ ለጥናቱ ተሳታፊዎች የተዘጋጀ መጠይቅ

ተ.ቁ	መጠይቆች	አማራጭ መልሶች	ምርመራ

201	ስንተኛ እርግዝናሽ ነዉ?	_____	
202	እርግዝናሽ ስንት ሣምንት ሆነው?	_____ ሣምንት	
203	ስንት ልጆች ወልደሻል?	_____	
204	ከአሁን በፊት የእርግዝና ክትትል ነበረሽ?	1. አዎ 2. የለም	
205	ለጥያቄ 204 አዎ ካልሽ ስንት ጊዜ	----------	
206	የእርግዝና ጊዜ አደገኛ ምልክቶችን ታውቂያለሽ?	1. አዎ 2. የለም	
207	ለጥያቄ 205 አዎ ካልሽ ምን ምን	----------	
208	የእርግዝና ጊዜ የደም ግፊት/ራስ መሳት ነበረሽ?	1. አዎ 2. የለም	
209	የፅንስ አመጣጥ በምን ነው?	1.በራሱ 2.በመቀመጫው 3.በተክሻው	
210	ያለጊዜው ምጥ ጀምሮሽ ነበር?	1. አዎ 2. የለም	
211	የሽርት ውሃ መቀነስ አለ?	1. አዎ 2. የለም	
212	የሽርት ውሃ መብዛት አለ?	1. አዎ 2. የለም	

ክፍል ሦስት፡ የውስጥ ደዌ መጠይቆች

ተ.ቁ	መጠይቆች	አማራጭ መልሶች	ምርመራ
301	የደም ማነስ ነበረብሽ/አለሽ?	1. አዎ 2. የለም	
302	የስኳር ህመም አለብሽ?	1. አዎ	

		2. የለም	

ክፍል አራት፡ ስነ ምግባር መጠይቆች

ተ.ቁ	መጠይቆች	አማራጭ መልሶች	ምርመራ
401	ሲጃራ ታጨሻለሽ ?	1. አዎ 2. የለም	

Annex 5: Assurance of Principal Investigator

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research and publications office of the Debre Birhan University.

Research Title: Determinant of Reduced Fetal Movement among mothers followed up in Government Hospitals, in North Shoa Administration Zone, Amhara National Regional State, Ethiopia: A Case Control Study

Name of the principal investigator: Abebaw Alemayehu

Signature: _____

Date: 14/12/2013 E.C

Approval of the advisor

Name of the first advisor: Dr. Abebe Minda (PhD)

Signature: 

Date: 14/12/2013 E.C