

Women's preferred childbirth positions and associated factors among postpartum mothers in public hospitals of South West Shoa Zone, Oromia, Ethiopia, cross-sectional study supplemented by qualitative data

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Women's preferred childbirth positions and associated factors among postpartum mothers in public hospitals of South West Shoa Zone, Oromia, Ethiopia, cross-sectional study supplemented by qualitative data

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Abstract

Background: maternal birth position is the position a mother assumes during childbirth. Freedom to choose birth positions will benefit the woman, baby, and health system. In Ethiopia, women are still giving birth by the lithotomy position, despite of their preference. The issue of birth position is the most neglected one during childbirth in Ethiopia. This study can provide clues for healthcare providers to respect women's preferred childbirth position, hence, this study was intended to assess the magnitude of women's preferred childbirth positions and associated factors among postpartum mothers in public hospitals of South West Shoa Zone, Oromia, Ethiopia.

Method: Facilities-based cross-sectional study design supplemented by qualitative data was conducted. A systematic random sampling technique was used to select 633 mothers. Data was collected using interviewer-administered structured questionnaires. Bivariable and multivariable logistic regression analysis were done to identify associated factors.

Results: About 391 (64.2%) of study participants gave birth by their preferred birth position. Mother age 21-30years (AOR=0.05;95%CI[0.004-0.75]) and 31-40years (AOR=0.02;95%CI[0.002-0.35]), attending school (AOR=3.88;95%CI[1.38-10.93]), Government employee (AOR=2.33;95%CI[1.08-5.01]), a monthly income of 2500-5000ETB(AOR=2.95;95%CI[1.32-6.56]), previous history of home delivery (AOR=1.96;95%CI[1.02-3.80]) and rural residence (AOR=0.43;95%CI[0.23-0.82]) were associated with women's preferred childbirth position. The qualitative finding depicts that health facility and health care providers-related barriers were the main barriers to women's preferred childbirth position in the study area.

Conclusion: women's preferred childbirth position was not respected for more than one-third of study participants. Mother age, educational level, occupation, monthly income, previous place of birth, and residence were associated with women's preferred childbirth positions. Health facility and health care provider's related barriers were the main barriers to women's preferred childbirth position.

Key words: women's preferred childbirth positions, postpartum mothers, public hospitals, South West Shoa Zone

Background

The birth position refers to the physical positions that a pregnant mother may adopt throughout the childbirth process(1). In labor and delivery, the birth position is important. During childbirth, positions and mobility can have a wide range of effects on labor and affect various birth outcomes(2).

The positions of birth can be categorized as supine or upright (vertical). A line connecting the center of a woman's third and fifth lumbar vertebrae is more horizontal than vertical in supine positions (the body weight is on the sacrum). Dorsal posture or recumbent (lying flat on back), semi-recumbent position (trunk leaned forward up to 30° to the horizontal), lithotomy position (lying flat on back with both legs held up in stirrups), and Trendelenburg position (head lower than pelvis) are all examples of supine positions(3). According to a recent study, the supine position should be avoided since it increases the chance of severe perianal injuries, prolongs labor, causes more discomfort, and changes the fetal heart rate pattern(4).

The body weight is off the sacrum in an upright position. The lateral position (lying on one's side), kneeling, sitting, standing, squatting (unaided or with squatting bars/birth cushion), and hands and knees are all examples of upright or vertical positions(2). The advantages of vertical positions over supine positions are numerous. This includes: using gravity to move the baby down the birth canal, less risk of pressure on major blood vessels that lead to the uterus, which, if compressed, can lead to aorto canal compression, stronger and more efficient contractions that dilate the cervix, and put the baby in a better position to pass through the birth canal(5). Another advantage of vertical positions is that they increase the space between the pelvic bones, minimize the time it takes to push out the baby, and reduce pain(6).

It has been suggested that giving birth in an upright position reduces the risk of perianal damage caused by spontaneous tears or the need for episiotomy(7). Upright positions allow the pelvic floor, particularly the sacroiliac joints, to maintain mobility, allowing it to reach its maximum capacity. Unlike supine positions, upright positions such as standing, kneeling, sitting, squatting, and hands and knees are linked to shorter second-stage of labor, less intense pain, lower rates of episiotomies and instrumental or assisted deliveries, and better newborn outcomes(3). Our

greatest aid in giving birth is gravity, but we enforce women to give birth on their backs for historical and cultural reasons(8).

Lithotomy positions are the most usual for pushing and delivering, however they increase the risk of a baby having heart rate abnormalities before birth. It may also increase the likelihood of the tissue at the vaginal entrance tearing during delivery(9). The emergence of the delivery bed was a result of the popularization of the supine position, but it was initially reserved for "difficult" labor, before becoming increasingly popular due to the convenience of the doctor and midwife(10).

Although there are conflicting findings about the effect of maternal position during labor, the World Health Organization (WHO) recommends that women at low-risk use movement and an upright position during delivery(11). During labor and delivery, healthcare professionals should help the mother in adopting any position they prefer, as well as change positions as needed. Evidence suggests that the maternal birth position can be used as a non-medical intervention to facilitate childbirth progress(4).

Ethiopian minister of health(MOH) obstetrics protocol guideline 2020 recommends that women can assume any position unless delivery is imminent, there is a need for operative vaginal delivery or episiotomy, options are semi-sitting, squatting, kneeling or left lateral position and prolonged recumbent position should be avoided(12). However in Ethiopia, mothers are still giving birth in the lithotomy position, despite their preference for other delivery positions and some women are dissatisfied with the lithotomy posture used in hospitals for a variety of reasons, including the fact that it delays labor pain, diminishes the attempt to push the baby, and compromises their respiratory system. However, several healthcare professionals and mothers did not prefer alternative birth positions for a variety of reasons, including the fact that it hurts the baby and makes it impossible to control the labor process. The mothers were coerced into adopting birth positions that were instructed by medical personnel. Mothers' lack of understanding about alternative birth options is a problem that leads them to stay passive to their preference and choice of birth positions (1).

WHO recommends intrapartum care for a positive childbirth experience, for women without epidural analgesia, encouraging the adaptations of a birth position of individual women's choice including an upright position is recommended(13). According to USAID's maternal and child survival program, women's preferred delivery positions are not respected. The mother, the fetus, and the health system will all benefit if a woman has the flexibility to choose her labor and delivery positions. Adopting an unfavorable position, the mother became a passive participant in the birth process(8). The lack of mother changes in birth position throughout labor might make labor more difficult and raise the likelihood of a cesarean birth if labor does not progress or descend(14). A woman's lack of choice in the delivery position, among other things, is regarded as a barrier to some women's utilization of facility-based childbirth care(8). Women in health institutions use the supine birth position for childbirth. As a result, women are forced to give birth at home. In comparison to mothers who gave birth in hospitals, mothers who gave birth at home had a wider range of delivery positions to choose from, with upright positions being the most popular(15).

The lithotomy position is the most usual position for pushing and giving birth, although it increases the chances that the fetus will have heart rate abnormalities before birth. It also raises the likelihood of the tissue near the vaginal opening tearing during delivery(9). The main international scientific societies advise women to avoid the supine position, because it has been linked to hypotension and an irregular fetal heart rate (FHR), and instead assist them in whichever positions they find most comfortable. The effects of various maternal delivery positions during labor on the woman, fetus, and newborn outcomes are rarely agreed upon, and the information in this field is frequently disputed and fragmented(2).

The institutionalization of delivery has resulted in a practice dominated by medical policies and procedures, making it difficult for midwives to provide women with options other than bed birth(16). Women's sense of control is linked to their choice of delivery position and freedom of mobility during birth(17). In the lack of conclusive evidence that one birth position is superior to another, women's personal preferences can be used to determine which birth position to use(18). Within a collection of poor; healthcare professional actions involving disrespect, abuse, and mistreatment during maternity care, preventing laboring mothers from choosing the comfortable birth position they choose is reported(19).

Women who use the supine position during childbirth are instructed by healthcare providers to do so(20). Those women who tried to adopt alternative birth positions during the delivery process, such as squatting, sitting, kneeling, hands and knees, were encouraged to be on their backs due to health care providers' preferences for intravenous fluid administration, monitoring of fetal heart rates (FHR), birth assistance, and perianal support(3).

Even though, the lithotomy position is convenient for health care providers, pushing the baby uphill against gravity is not ideal for delivering mothers, especially first-time mothers(21). Women's preferences play a role in birth position selection(22). Mother knowledge of birth positions; mother education, antenatal education, and previous place of birth are all factors that influence the decision to adopt a certain birthing position(23).

Ethiopian minister of health(MOH) obstetrics protocol guideline 2020 recommends that women can assume any position unless delivery is imminent, there is a need for operative vaginal delivery or episiotomy, options are semi-sitting, squatting, kneeling or left lateral position and prolonged recumbent position should be avoided(12). However in Ethiopia, mothers are still giving birth in the lithotomy position, despite their preference for other delivery positions and some women are dissatisfied with the lithotomy posture used in hospitals for a variety of reasons, including the fact that it delays labor pain, diminishes the attempt to push the baby, and compromises their respiratory system. However, several healthcare professionals and mothers did not prefer alternative birth positions for a variety of reasons, including the fact that it hurts the baby and makes it impossible to control the labor process. The mothers were coerced into adopting birth positions that were instructed by medical personnel. Mothers' lack of understanding about alternative birth options is a problem that leads them to stay passive to their preference and choice of birth positions (1).

Only perception of mothers to ward child-birth position in Jimma medical center is known in Ethiopia, however nothing is known about women's preferred child birth position in study area as well as in Ethiopia, which is affected by different sociodemographic factors; health care provider-related factors, pregnant mother-related factors such as types of birth position mothers know and having health education on birth position, health facilities-related factors, and obstetric-related factors. Hence, this study was intended to assess the magnitude of Women's preferred childbirth positions and associated factors among postpartum mothers in public

hospitals of South West Shoa Zone, Oromia, Ethiopia. This study can provide clues for healthcare providers to respect mothers' individual childbirth position preferences, for health institutions this study can provide hints to see their activities on respecting women's preferred childbirth position during labor. This study also can provide clues for stakeholders, and other concerned bodies to improve or develop strategies and programs for the implementation of women's preferred childbirth position. In addition, the study can provide baseline data for other researchers to further conduct another study regarding this issue, and finally, for laboring mothers, this finding can be used as input for concerning bodies to respect women's preferred childbirth position.

4. Methods

4.1. Study Area and Period

The study was conducted in hospitals of the South West Shoa zone, from September 1-October 30, 2022. South West Shoa zone is one of the zones in the Oromia regional state. The capital town of South West Shoa zone is Woliso, which is found at 114km from the capital city of Ethiopia Addis Ababa. According to the 2007 Census by the Central Statistical Agency of Ethiopia, the South-West Shoa zone has total populations of 1, 154,048; among this 88.89% are rural populations whereas 11.12% were urban. Females were 49.85% and males were 50.15% of the total population. South-West Shoa zone has six public hospitals, 54 health centers, 264 health posts, 72 private clinics, and 28 drug stores. Those hospitals are Woliso general hospital, Tulu bolo general hospital, Amaya primary hospital, Bantu primary hospital, Ieman primary hospital, and St. Luke catholic hospital.

4.2. Study Design

Facilities-based cross-sectional study design supplemented by qualitative data was used to assess women's preferred childbirth position and their associated factors.

4.3 Population

4.3.1 Source population

All postpartum women in their immediate postpartum period in public hospitals of South West Shoa zone were source populations. For the qualitative study, all multiparous mothers in their immediate postpartum period, all MCH team leaders, and senior obstetric care providers in public hospitals of the South-West-Shoa zone were the source population.

4.3.2 Study populations

All postpartum women in their immediate postpartum period in the selected public hospitals of South West Shoa zone during the study period. For the qualitative study, all multiparous mothers in their immediate postpartum period, all MCH team leaders, and senior obstetric care providers in public selected hospitals of the South-West-Shoa zone during the study period were the study population.

4.3.3 Sampling unit

Individual postpartum women in their immediate postpartum period and selected for study in selected hospitals were a sampling unit. For the qualitative study, individual multiparous mothers in their immediate postpartum period, MCH team leaders, and senior obstetric care providers were sampling units.

4.3.4 Inclusion and exclusion criteria

4.3.4.1 Inclusion

All women in their immediate postpartum period, who were delivered by spontaneous vaginal delivery (SVD) during data collection, were included.

4.3.4.2 Exclusion criteria

Women in the immediate postpartum period with acute illness, mentally ill, and unable to speak and hear during data collection were excluded.

4.4 Sample Size Determination and Sampling Technique

4.4.1. Sample Size Determination

The sample size was calculated using single population proportion formula, by considering the following assumptions, the proportion (p) for women's preference of birth position is 50% since there is no study done on women's preference of birth position, 95% confidence level, 5% margin of error and 10% non-response rate, the sample size will be 633. For the qualitative study sample size was determined based on the data saturation point.

4.4.2. Sampling procedures

The study was conducted in public hospitals of the South-West-Shoa zone. Simple random sampling was used to select four public hospitals among six hospitals in the South-West-Shoa zone. Tulu bolo general hospital(TGH), Bantu primary hospital(BPH), leman primary hospital(LPH), and Amaya Primary hospital(APH) were selected randomly. The number of study participants was allocated proportionally to each selected hospital based on the previous month's delivery report of 7416. Then, systematic random sampling techniques were employed to recruit study participants. The value of Kth(sampling interval)was calculated by $N/n, = 7416/633=12$, so every twelfth interval data were collected. Sampling frame was delivery registration number of

mothers in selected hospitals. The first respondent was selected randomly by lottery method from 1-12, the selected number was 7, then 19. A total of 44 MCH team leaders and senior obstetric care providers (36 midwives, 7 IESO, and 1 obstetric and gynecologist) were available in selected hospitals, and those who had work experiences of greater than one year were selected purposively. Multiparous mothers in their immediate postpartum period who had a history of home delivery in the past were also selected purposively for key informant's interviews.

4.5 Study variables

4.5.1 Dependent variable

Women's preferred childbirth position

4.5.2 Independent variables

Sociodemographic characteristics:

Age

Occupation,

Educational level,

Residence and

Income level.

Obstetric-related factors:

Parity

ANC follow up

Disease during pregnancy

Health provider-related factors:

Monitoring of FHR,

Provide IV fluid administration,

Provide birth assistance and

Having trained in birth position.

Mother-related factor:

Birth positions mother knows and

Having health education during ANC on birth position.

Facilities-related factors:

Presences of equipment,

Availability of enough space and bed.

4.6 Operational definitions and definitions of terms

Preferred child-birth position: is when mothers gave birth by their preferred childbirth position(the birth position they choose) during delivery.

Non-preferred child-birth position: is when mothers gave birth in their non-preferred childbirth position(the birth position they did not choose) during delivery.

Upright birth position: those maternal birth positions that include sitting, squatting, standing, kneeling, and all in four(2).

Supine birth position: Supine positions include dorsal, where the patient lies flat on her back; lateral, where the patient is laying on her side; semi-recumbent, where the patient is partially upright; or lithotomy, where the patient's legs are raised in stirrups(28).

Having trained on delivery position: is about health care provider whether he/she had training on birth position directly or indirectly, such as BEmOC.

4.7 Data collection tools and procedures

4.7.1 Data collection tools

Data were collected using an interviewer-administered structured questionnaire which was prepared in English first and then translated into Afan Oromo. The questionnaire consists of 30

questions with 2 sections that cover questions to assess sociodemographic factors (age, marital status, educational status, religion, income level, and residence), questions related to childbirth position preference, and factors associated with childbirth position preference (mother related factor such as having health education during ANC on birth position and questions related to types of birth position mother's know). For qualitative data questions related to barriers to women's preferred childbirth positions, open-ended questions prepared on health care provider-related barriers such as monitoring of FHR, Providing IV fluid administration, providing birth assistance, and having training on birth position and facilities-related barriers such as the presence of equipment, availability of enough space and bed. To get a thorough understanding of the study's topic, probes and follow-up questions were employed, based on the research question. Different relevant literature was reviewed to develop the tool that addresses the objective of the study(17,23–25).

4.7.2 Data collection procedures

Data was collected by an interviewer administered structured questionnaires, after the mothers and her infants were stable within the first 24 hours of post-partum period. They were interviewed in post-natal ward and no attendants were allowed to stay with mother in order to keep her privacy. For the qualitative study, open-ended questions were asked of the key informants, multiparous mothers in their immediate postpartum period, MCH team leaders, and senior obstetric care providers. Data was collected from multiparous mothers during the first 24 hours of their postpartum period after they were stable. The interviews were conducted by the principal investigator by using the open-ended interview guide. Permission was obtained from participants for an audio recording of the interview. A total of 14 in-depth interviews were conducted, composed of seven key informants from multiparous mothers and seven from health care providers.

4.8 Data quality control

To assure data quality, the tools was pretested on 5% of study participants at Ambo general hospital and the necessary correction and modification of the tools were considered accordingly. The validity and reliability of the tools were estimated and indicated, cronbach alpha for 32 mothers was 0.97 on the pretest. Investigator checked the data for completeness, accuracy, and clarity before data entry on daily basis. Supervision was also done on the spot by the supervisor.

Data cleaning-up and cross-checking were done before analysis. Four BSc midwife collected data through interviewer-administered questionnaires and was supervised by one BSc midwife. One day's orientation on the study tool and the data collection approach was given to data collectors and supervisors.

For qualitative data, the principal investigator collected data by in-depth interview, Afan Oromo version was used to collect data from multiparous mothers in their immediate postpartum period and MCH team leaders and senior obstetric care providers. Data were recorded by the audio recorder and supported by note-taking. The recorded data were transcribed and reviewed with audiotapes. Data were translated from Afan Oromo to English and checked to maintain consistency.

4.9 Data analysis

Data entry into Epi-data version 3.1 and exported into Statistical Package for Social Science (SPSS) version 25 for analysis. Descriptive statistics such as frequency, proportion, mean and standard deviation were employed in describing the socio-demographic, obstetric characteristics, and women's preferred childbirth position. Variables with p-value <0.25 in the bivariable logistic regression analysis were candidates for the multivariable logistic regression model for controlling confounding variables. Multi-collinearity between independent variables in the model was checked and variance inflation factors(VIF) were found acceptable (1.004-1.164). The Hosmer Lemeshow goodness of fit test indicated(p= 0.947) that model was good enough to fit the data well. Adjusted odds ratio with 95% CI were used to assess women's preferred childbirth position and explanatory variables. Finally, statistical significance was set at p-value<0.05 with 95% CL. For qualitative data, transcription and thematic analysis were done. To ensure uniformity, the verbatim data was translated from Afan Oromo to English. Narrative texts followed by participants' quotations were applied around the themes. Italic fonts were used in quotations.

4.10 Ethical consideration

Ethical clearance for the study was obtained from the Ethical Review Board (ERB) of Ambo University, College of Medicine and Health Sciences before data collection. Permission to conduct the study was also obtained from each selected hospital and responsible bodies of the

respective department. Data was collected after getting verbal informed consent from each eligible postpartum woman, MCH team leaders, and senior obstetric care providers in each selected hospital. The study participants were informed, participating in the study was entirely voluntary and withdrawal from participation was possible. In addition, the objective, benefit of the study, their right to deny participation, and the confidentiality of information they give were explained to them. Confidentiality was maintained at all levels of the study. Items seeking personal information like name, and phone number were not included in the questionnaires to ensure privacy and confidentiality. In addition, the study participants were informed that no reports in this study were to identify individual study participants. Participating in the study had no effect on the service provided to mothers. In addition, there was no benefit for participation and no physical harm. Study participants were allowed to ask questions where necessary and their questions were answered. The key informants were informed that the in-depth interview was recorded and after their agreement, their anonymous quotes were used. If the study participants have further inquiries they may ask the researcher by using the researcher's address (cell phone number and email address).

4.11 Dissemination of result

The finding of this research study will be presented to the Ambo University College of Medicine and Health Science. The findings also will be presented at various seminars and workshops and are expected to be disseminated to all concerned bodies. The publication will be considered by scientific journals for researchers and others in need.

5. Results

5.1 Socio-demographic characteristics of respondents

The overall response rate was 609(96.20%). The mean age of mothers was 27.29(\pm 5.44) years ranging from 18 to 43. Of the total respondents, 486(79.80%) were in the 21-30 years age group and 560(92.0%) were married. About 236(38.8%) of mothers can write and read and 387(63.5%) were orthodox Christians. More than half 364(59.8%) had earned less than 2500 ETB per month and 350(57.5%) lived in the rural area (Table 1).

Obstetric characteristics of study participant

Among the study participants, 253(41.5%) women were primiparous. About 515(84.6%) had more than two times ANC follow-up, 49(8%) had less than two times ANC follow up and 45(7.4%) never had ANC follow-up. Of the total postpartum women's 108(17.7%) had a history of medical disease during their current pregnancy. Among those women who had the disease during their current pregnancy, 40(6.6%) had pregnancy-induced hypertension(PIH), 12(2%) had the cardiac disease and 56(9.2%) had other diseases such as malaria and hyperemesis gravidarum. Among those multipara women's, 258(72.5%) had a history of home delivery in the past.

5.2 Women's preferred Childbirth positions

About 391(64.2%)[60.3%-68%] of mothers gave birth by their preferred birth position. About 218(35.8%) of mothers delivered by supine birth position, because of health care providers instructed them to do so. All of them 609(100%) responded, having health education on birth position during ANC has to benefit laboring mothers. More than half of mothers 218(35.8%) were uncomfortable with the birth position they had. Only 6(1%) of them had health education on birth position during their ANC period. Three-fourths 468(76.8%) of them know the supine birth position (Table 2).

Among those women who preferred the supine birth position, around 182(46.54%) preferred it due to comfort and perceived safety for the baby (figure 1).

5.3 Factors associated with women's preferred childbirth positions

Variables such as the mother's age, educational level, occupation, income level, residence, disease during pregnancy, previous place of birth, and the number of ANC follow-ups showed significant associations in bivariable logistic regression. Multivariable logistic regression analysis was also done to predict mother's preferred childbirth position using variables that have p-value <0.25 during bivariable logistic regression analysis. Finally using multivariable logistic regressions, variables such as the mother's age, educational level, occupation, monthly income, residence, and previous place of birth were significantly associated with mother's preferred childbirth position.

The odds of using the preferred childbirth position were 95% and 98% less likely among mothers in the age group of 21-30years [AOR=0.05;95%CI=0.004-0.75] and 31-40years [AOR=0.02;95%CI=0.002-0.35] respectively as compared to those in the age group of less than 20. The odds of using the preferred childbirth position were found to be 3.88 times higher among mothers who attend school [AOR=3.88;95%CI=1.38-10.93] as compared to those who cannot read and write. The odds of using the preferred childbirth position was 83% less likely among mothers who are farmers[AOR=0.17;95%CI=0.05-0.59] as compared to those who are house-wives. The odds of using the preferred childbirth position were found to be 1.91 and 2.33 times higher among mothers who are self-employee[AOR=1.91;95%CI=1.02-3.58] and government employee[AOR=2.33;95%CI=1.08-5.01] as compared to those who are house wives. The odds using preferred the childbirth position was found to be 2.95 times higher among mothers who earn a monthly income of 2500-5000 ETB[AOR=2.95;95%CI=1.32-6.56] as compared to those who earn a monthly income of less than 2500 ETB. The odds of using the preferred childbirth position was 57% less likely among mothers who live in rural[AOR=0.43;95% CI=0.23-0.82]as compared to those mother living in the urban area and the odds of using the preferred childbirth position was found to be 1.96 times higher among mothers who had a history of home delivery previously[AOR=1.96;95% CI=1.02-3.80] as compared to those who gave birth in health facilities(Table 3).

5.4 Barriers to mother's preferred childbirth position

A total of 14 in-depth interviews were conducted, with seven key informants from mothers and seven from health care providers (MCH team leaders and senior obstetric providers). Regarding multiparous mothers, their ages were in between 28-40 years, four mothers had no formal education, five of them were Orthodox Christian and four of them lived in rural areas. Healthcare providers were interviewed from labor and delivery, postnatal ward, and MCH clinic. Four of them were Bsc midwives and Five of them were male, their ages in between 25-32 years and their work experience ranged from 1-10 years. The qualitative data were particularly focused on barriers to childbirth position preferences which were thematized into three main themes; health facilities-related barriers, health care providers-related barriers, and recommendations given by key informants.

Health facilities related barriers

Key informants, especially multiparous mothers complain that there were problems of privacy and back pain when assuming the supine position in health facilities compared with that of the birth position used in home delivery.

A 40 years multiparous mother complain that "I gave birth four times at home, and two of them at health institutions including the current one, in home delivery I may assume the position of my interest, not only that women's especially elders or TBA rubs my back to reduce back pain. but when I gave birth in a health facility, even though the care given was very good, there were problems of privacy and back pain on the delivery bed"

35-years old multipara mother said, "I delivered two of my children in the home, three of them delivered in health facility including this one. I used a kneeling position when I gave birth in the home; only women stayed with me, and others stay in other homes or outside. But in health facilities everybody can enter the delivery room and see our body or genital organ, it is better if it was done in consistence with our culture"

Some of the key informants reported that there is a lack of furniture (equipment) and supplies to provide mothers with preferred childbirth positions. These pieces of equipment are like beds, pillows, and mattresses. In addition to that, the healthcare providers also added that inadequate

rooms and inappropriate delivery coaches (currently available coaches) were by themselves, the barriers to practicing childbirth position preferences.

32-year male MCH team leader said *"To practice mother preferred birth positions, it needs personal protective equipment, a modified delivery coach suitable to assume different birth positions, practicing alternative birth position on the already available delivery coach is impossible since that delivery coach from the beginning it was manipulated to assist birth in supine position only"*

Health care providers related barriers

There were also multiparous mothers and healthcare providers who complain that healthcare providers did not want to assist the mothers in upright positions due to supine positions being suitable for themselves, they only worried about their comfort, not for the mother's safety. The health care providers also complain that, to practice other birth positions other than supine we need to have training on how to assist mothers in different birth positions.

28 years multipara mother complain that *"Even if we want to delivery in other birth position other than supine, we were enforced to assume supine birth position due to orders(command) given by health care providers"*

The health care providers were also confirmed this problem, 28 years male BSC midwife said *"we as health care providers ordered the laboring mothers to assume the supine birth position, but the mother may want to assume other birth positions such as kneeling, squatting, and sitting, I was seen on my duty, some mothers suddenly go out of the delivery coach and assume other position like squatting on the floor"*

The health care providers complain that, to practice other birth positions other than supine we need to have training regarding how to assist mothers in different birth positions. 32 years, male, senior obstetric care provider (BSC midwife) said *"There is no training regarding different birth positions, this issue should be the concern of health sectors including government especially those on managerial area and NGO"*

30 years, female, BSC, midwife said, *"lithotomy position is not comfortable for many women, there is the problem of privacy, but its advantages are to assist delivery and to repair the tear. If*

we want to practice positions other than lithotomy, we can do it with resources on hand, especially if labor progressed normally, but the problem is how we assist them and identify whether the fetus is in distress or not, so we need to have the training to practice different birth positions"

Health care providers also rise, to provide health care services for mothers who were in labor, most of the time they were using positions such as supine and lateral position, 32 years obstetric and gynecologist specialist said, *"when the mother was in the second stage of labor, most of the time we use supine position for monitoring of FHB and assisting of birth, for providing of IV fluid we can use both supine and lateral position"*

The recommendation given by key informants

To overcome these problems of childbirth positions preferences, health care providers and multiparous mothers address the following solutions such as providing training for health care providers, supplying equipment, asking the laboring women for their preference of childbirth positions before conducting delivery, supply of appropriate delivery coaches and beds which will be used to practice alternative birth position.

30 years multipara mother said, *"It will be better if other birth positions will be allowed in health institutions and privacy will be kept, even if this was the problem I don't want to give birth at home,"* 32 years male MCH team leader said *"since currently available delivery coaches were developed to assist the mother in lithotomy birth positions and not for other position, to solve these problems it's better to develop appropriate delivery coaches for upright positions too, hence any stakes holders should fulfill appropriate delivery coaches and beds to practices different birth positions"* 32 years male, Gynecologist and obstetrician said, *"lithotomy position is not preferable for women giving birth but because of our setup we use it, to reduce this problem working on health care providers is essential i.e. providing training to change their attitude, practice and knowledge".*

6. Discussions

The result of this study shows that, only 391(64.2%,95%CI[60.3%,68.0%]) of study participants gave birth by their preferred birth position. This finding is not in line with,WHO

recommendations for intrapartum care for a positive childbirth experience(13). This variation might be due to this recommendations are not functioning in this health facilities and healthcare providers in this study area having no training on different birth positions and only the supine birth position is used, whether the mothers prefer it or not. This finding is lower than the finding of studies done in Malawi and Delta state of Nigeria that show from total study participants,76.8% and 95% of mothers respectively delivered by their preferred birth position while they gave birth(24,25). This difference might be due to socio-demographic characteristics of studies participants such as educational level, cultural and religion of study participants and level of health service utilization of the country. This finding is higher than the finding of the study done in the Netherlands which indicate, of the total study participants 58.9% of them gave birth by their preferred birth position(17). This variation might be due to difference in sample size(they were used large sample size of 1154) and in this study area all women gave birth by supine birth position and more than half of mothers preferred this supine birth position, so they got their preferred birth position because the only used birth position in the study area is supine. This finding also not in line with Ethiopian minister of health obstetrics protocol of 2020 guideline, which recommends women can assume any birth position while she is giving birth(12). This difference might be due to this guideline is not applicable in these health institutions and health-care providers in this study having no training on how to assist mothers in alternative birth positions. The qualitative aspect also supports this finding, as 32 years, male, BSC midwife said *"There is no training regarding different birth positions, this issue should be the concern of health sectors including government especially those on managerial area and NGO"*

This study indicates mothers in the age group of 21-30 years and 31-40 were 95% and 98% less likely to use their preferred childbirth position respectively as compared to those in the age group of less than 20. This finding is not similar to the finding of a study done in Malawi that shows, those in the age groups of 21 to 30 (58.1%) and 31 to 40 (35.5%) have a higher birth position preference than those in the other age groups(25). This difference might be due to the socio-demographic characteristics and sample size difference between the two studies. Similarly, this finding is not similar with studies done in the Netherland and Kenya, indicating age of women had no significant association with child birth position preference(17,23). This difference might be due to socio-demographic characteristics, sample size variation and study design used.

Concerning mothers educational status this study revealed that the educational level of mothers influenced the choice of birth position provided that, mothers who attend school were 3.88 times more likely to use their preferred childbirth position as compared to those who cannot read and write. This finding is similar to the finding of a study done in the Netherlands that shows, mothers having intermediate level of education are 3.85 times more likely to use their preferred childbirth position (17). This finding is also similar to the finding of studies done in Malawi and Kenya which indicate, those attend school >4 times more likely to use their preferred birth position, and mothers who had secondary level of education was statistically significant respectively(23,25).

This study shows mothers who are farmers were 83% less likely to use their preferred childbirth position as compared to those who are house-wives. This finding is not similar to the finding of a study done in Mama Lucy Kibaki hospital in Kenya, which shows a positive correlation between the use of a mother's preferred birth position and occupation and is statistically significant(22). This difference might be due to those mothers may live in rural area and may not get access of information about different birth position. The study also shows mothers who were self-employees and government employees were 1.91 and 2.33 times more likely to use their preferred childbirth position respectively as compared to those who were house-wives. This finding is not similar to the finding of a study in Malawi indicating, there was no significant association between women's occupations and their use of preferred childbirth position(25). This difference might be due to those mothers may had awareness of different birth position and its advantages.

Mothers who earn a monthly income of 2500-5000 ETB were 2.95 times more likely to use their preferred childbirth position as compared to those who earn a monthly income of less than 2500 ETB. This finding is not similar to the finding of a study done in Malawi that shows a mother who earns a monthly family income of <60,000 Malawian Kwacha were more likely to use their preferred childbirth position than a mother who had earned a higher income(29). This variation might be due to socio-economic characteristics of the study participants and also those mothers who earn greater monthly income may have a chance to get information regarding knowledge of various birth positions from different mass media such as television, and other social media, and

most of the time those who earn a greater income had higher educational status and they may have knowledge of the different birth position.

Mothers who living in rural were 57% less likely to use their preferred childbirth position as compared to those mothers living in urban areas. This finding is not similar to the finding of a study in Malawi that indicates the residential area of study participants had no significant association with the childbirth position the mother may use(15). This difference might be due to the socio-demographic characteristics of the setting and another reason may be those mother living in urban may get knowledge of different birth position from different source and may want to use it.

Concerning the mother's previous place of birth, mothers who had a history of home delivery in the past were 1.96 times more likely to use their preferred childbirth position as compared to those who gave birth in health institutions. This finding is similar to the finding of a study done in the Netherlands that shows mothers who gave birth at home were 2.26 times more likely to use their preferred childbirth position as compared to those who gave birth at a health facility(17). This finding is not similar to the finding of a study done in Kenya that shows concerning previous places of delivery, those who delivered in a hospital were significantly associated with use of mother preferred birth position(22). This variation might be due to those mothers may enforce the healthcare providers to respect their preferred birth position since they may use other birth position in home delivery.

The qualitative aspect of this finding indicated that equipment such as a delivery coach suitable for assuming the upright birth position, beds, pillows, and chairs was needed to practice the mother's childbirth position preference, but there was a lack of such equipment in the study area. This finding is similar to the study done in Jimma, which indicates another problem that prevents mothers from practicing different birth positions were lack of hospital set-up, which includes a bed, chair, and enough room(1).

The key informants also complain that healthcare providers did not want to assist the mothers in other birth positions other than supine due to it being suitable for them; they only worry about their comfort, not for the mother's safety. This finding is similar to the Tanzania study finding which indicated, the supine position is preferred by healthcare providers as the most popular and

widely used birth position because it gives them the freedom to continuously monitor the progress of labor and provide the best delivery assistance(26).

Conclusion

Based on the finding of this study, women's preferred childbirth position was not respected for more than one-third of study participants in study area and the finding is inconsistent with the WHO recommendation. The study identified mother's age, educational level, occupation, monthly income, previous place of birth, and residence were associated with women's preferred childbirth position. Lack of furniture that assists mothers to assume the birth position of their interest, a delivery coach by itself, and lack of training for health care providers on birth position are barriers to women's preferred childbirth position in the study area.

Availability of data and materials

All data generated during this study are included in this published article and its supplementary information files. The dataset for this study are available from the corresponding author upon reasonable request.

List of Acronyms and abbreviations

ANC: Antenatal Care, AOR: Adjusted Odd Ratio, CL: Confidence Level, COR: Crude Odd Ratio, FHR: Fetal Heart Rate, MOH: Minister Of Health, HCP: Health Care Providers, LFSOL: Latent First Stage of Labor, MCH: Maternal and Child Health, SPSS: Statistical Package for Social Science, PNC: Post-Natal Care, PROM: Premature Rupture Of Membrane, WHO: World Health Organization

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Contributions

TKA conceptualized the study and supervised the data collection process. Led the analysis of the data presented in this paper, prepared the draft manuscript, with substantial inputs from. All authors have reviewed and approved this final draft of the manuscript. NW, TK , and GA assisted in the design and proposal development, monitored data collection, assisted during analysis and revised subsequent drafts of the paper. All authors read and approved the final manuscript.

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Ethics declarations

Ethical clearance for the study was obtained from the Ethical Review Board (ERB) of Ambo University, College of Medicine and Health Sciences before data collection with reference.no [AU/PGC/412/2014](#). Permission to conduct the study was also obtained from each selected hospital and responsible bodies of the respective department. Data was collected after getting written informed consent from each eligible postpartum woman, MCH team leaders, and senior obstetric care providers in each selected hospital. The study participants were informed, participating in the study was entirely voluntary and withdrawal from participation was possible. In addition, the objective, benefit of the study, their right to deny participation, and the confidentiality of information they give were explained to them.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Table 1: Socio-demographic characteristics of postpartum mothers in public hospitals of South West Shoa Zone, Oromia, Ethiopia, 2022

Variables	Frequency	Percent
Age group		
<20	36	5.91
21-30	486	79.80
31-40	87	14.2
Marital status		
Married	560	92
Single	21	3.4
Others *	28	4.6
Educational status		
Cannot read and write	83	13.6
Can read and write	236	38.8
Attend school	132	21.6
Attend higher education	158	25.9
Occupation		
House-wives	166	27.3
Farmers	78	12.8
Students	32	5.3
Self-employee	227	37.3
Government employee	106	17.4
Religion		
Orthodox	387	63.5
Protestant	144	23.6
Wakefata	42	6.9
Others**	36	5.9
Income level		
<2500 ETB	364	59.8
2500-5000ETB	124	20.4
>5000ETB	121	19.9
Residence		
Urban	259	42.5
Rural	350	57.5

*=divorced,widowed

**= Catholic, Muslim, and no religion or pagan

Table 2: Preferred childbirth positions among postpartum mothers in public hospitals of South West Shoa Zone, Oromia, Ethiopia, 2022 (n=609)

Variables	Response	Frequency	Percent
Birth Position mother used (n=609)	preferred	391	64.2
	Non-preferred	218	35.8
The actual birth position they used in the hospital	Supine	609	100
Reason for using non-preferred birth position (n=218)	HCP instructed them to do so	218	100
Mother's Preference for the birth position(n=609)	Supine	391	64.2
	Upright	218	35.8
Reason for not preferring upright birth position(n=391)	Upright position may be more difficulty	17	4.34
	May endanger my baby	87	22.25
	Unconventional birth position	161	41.17
	I am afraid of trying it	23	5.88
	I preferred to continue the birth position I am familiar with	103	26.34
Reason to prefer upright position(n= 218)	Easy to deliver	67	30.73
	More relaxing	84	38.53
	Make labor quicker	67	30.73
Having health education on the birth position at ANC benefit mother(n=609)	Yes	609	100
The birth position is chosen by (n=609)	Mother	391	64.2
	HCP	218	35.8
Mother's comfort with the birth position they used(n=609)	comfortable	391	64.2
	Un comfortable	218	35.8
Is there any advice on the birth position you give for the hospital(n=609)	Yes	206	33.8
	No	403	66.2
Mother advice on birth position(206)	HCP should offer an upright position	23	3.6
	HCP should ask birth position mothers want to use during delivery	91	14.9

	HCP should teach mothers about birth positions during ANC	37	6.1
	HCP should explain to mothers about advantages of alternatives birth positions	55	9.0
Reason not to give advice (n=403)	They know what is supposed to be done	234	58.0
	I am supposed to follow what they tell me to do.	115	28.5
	It is difficult to advise them because it's their job.	54	13.5
Health education on the birth position at ANC period(n=609)	Yes	6	1
	No	603	99
Types of birth position mother know(n=609)	Supine	468	76.8
	Upright	141	23.2
Source of information(n=609)	Heard from friends	218	35.7
	Heard from relatives	69	11.3
	Learned from HCP during the ANC period	3	0.5
	Learned from HCP in labor and delivery rooms	319	52.4
Upright birth positions reduce the intensity of the pain(n=609)	Favorable	531	87.2
	Unfavorable	78	12.8
Upright positions make pushing the baby easier(n=609)	Favorable	525	86.2
	Unfavorable	84	13.8

Table 3: Bivariable and multivariable logistic regression result for factors associated with women's preferred childbirth position among postpartum mothers in public hospitals of SouthWest shoa zone, Oromia, Ethiopia, 2022 (n=609)

Variables	Preferred birth Position		COR(95% CI)	AOR(95% CI)	P-value
	Yes	No			
Age group(in years)					
<20	32	4	1	1	
21-30	329	157	0.26[0.09-0.75]	0.05[0.004-0.71]	0.02
31-40	30	57	0.06[0.02-0.20]	0.02[0.002-0.35]	0.006
Educational level					
Cannot read and write	55	28	1	1	
Can read and write	174	62	1.42[0.83-2.45]	1.12[0.56-2.23]	0.74
Attend school	103	29	1.80[0.97-3.34]	3.88[1.38-10.93]	0.01
Higher education	59	99	0.30[0.17-0.53]	1.16[0.51-2.61]	0.71
Occupation					
Housewife	111	55	1	1	
Farmers	13	65	0.09[0.05-0.19]	0.17[0.05-0.59]	0.006
Students	28	4	3.46[1.15-10.38]	1.42[0.35-5.74]	0.62
Self-employee	160	67	1.18[0.76-1.82]	1.91[1.02-3.58]	0.04
Government employee	79	27	1.45[0.84-2.49]	2.33[1.08-5.01]	0.03
Income level					
<2500	239	125	1	1	
2500-5000	93	31	1.56[0.99-2.48]	2.95[1.32-6.56]	0.008
>5000	59	62	0.49[0.32-0.75]	0.65[0.30-1.43]	0.28
Residence					
Rural	143	116	0.50[0.36-0.71]	0.43[0.23-0.82]	0.01
Urban	248	102	1	1	
Disease					
Yes	62	46	0.70[0.46-1.07]	0.96[0.46-1.99]	0.91
No	329	172	1	1	
Previous place of birth					
At home	174	84	2.65[1.64-4.26]	1.96[1.02-3.80]	0.04
Health facilities	43	55	1	1	
Number of ANC follow up					
Never	34	11	1	1	

< two times	33	16	0.66[0.27-1.64]	1.72[0.47-6.19]	0.40
>two times	324	191	0.54[0.27-1.10]	1.74[0.58-5.21]	0.32

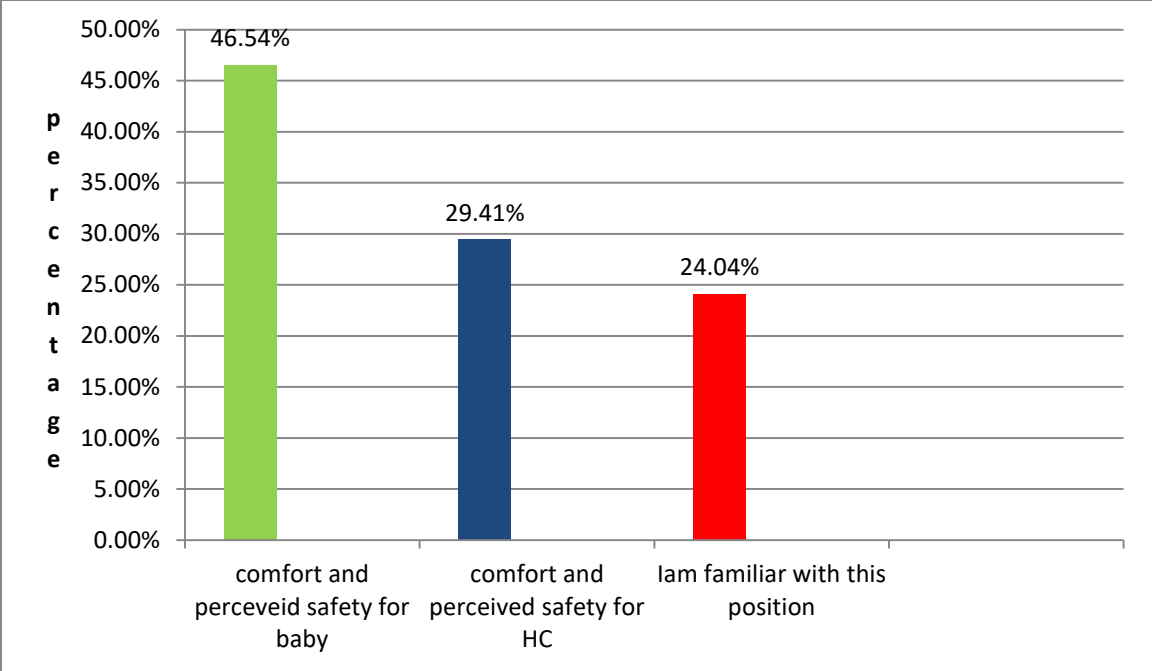


Figure 1: Response of mothers for why they prefer supine birth position for their future delivery