Prevalence of harmful traditional practices during pregnancy and associated factors in Southwest Ethiopia: a community-based cross-sectional study

Melkamsew Tesfaye,1 Nahom Solomon,1 Dawit Getachew,1 Yemisrach Belete Biru 2

ABSTRACT

Objective To assess the prevalence of harmful traditional practices during pregnancy and associated factors in Southwest Ethiopia.

Design A community-based cross-sectional study.

Setting Southwest Ethiopia.

Participants 667 women who were pregnant at the time of the study or gave birth 2 years prior to the study have participated.

Outcome of the study Harmful traditional practices during pregnancy (yes/no). Harmful traditional practices during pregnancy include abdominal massage, herbal intake or food taboos done on/by pregnant women without health professionals' instruction.

Results The prevalence of harmful traditional practices in the study area was 37%, 95% CI (33.4% to 40.8%). The most commonly practised activities were abdominal massage (72.9%), intake of herbs (63.9%) and food taboos (48.6%). Monthly income (AOR=3.13, 95% CI (1.83 to 5.37), p<0.001), having had no history of child death (AOR=2.74, 95% CI (1.75 to 4.29), p<0.001), women with no formal education (AOR=4.81, 95% CI (2.50 to 9.23), p<0.001), women who had antenatal care (ANC) visits during their last pregnancy (AOR=0.24, 95% CI (0.10 to 0.59), p=0.002) and being multipara (AOR=0.47, 95% CI (0.27 to 0.80), p=0.003) were significantly associated with harmful traditional practices during pregnancy.

Conclusion Our study showed that more than one-third of women in Southwest Ethiopia practised harmful traditional practices while they were pregnant. The practices were more common among primiparas, women who had lower educational and financial status, women with no ANC visits, and women with no history of child death. Health education should be given to the community about the complications of harmful traditional practices during pregnancy.

INTRODUCTION

Annually, around 358,000 women die worldwide due to pregnancy and childbirth-related complications. Most of these maternal deaths occur in low/middle-income countries; specifically in sub-Saharan Africa. Women of childbearing age are at risk of a wide range of traditional beliefs and practices during pregnancy. These traditional beliefs and practices highly determine the healthcare services that women receive during pregnancy and childbirth.

Globally, different types of traditional beliefs and practices are distributed at different rates, depending on cultural, social, political and economic structures. However, modern medicine failed to emphasise these practices. The common traditional practice during pregnancy includes; abdominal massage, food taboo practices and herbs usage.

Abdominal massage during pregnancy and labour is an age-long practice in many cultures and regions of the world. In addition to its discomfort and severe pain, abdominal manipulation may lead to placenta previa, excessive bleeding, uterine rupture, incomplete placental separation and threatened abortions.

Maternal undernutrition is one of the factors which leads to poor pregnancy and birth outcomes. It is not uncommon for...
pregnant women to be deprived of nutritious foods during different trimesters of pregnancy. Studies conducted in Asia, Turkey and Africa showed that there are certain foods that pregnant women are restricted or encouraged to eat during pregnancy. In Ethiopia, studies conducted in Amhara and Oromia regions showed that the magnitude of nutritional taboos among pregnant women ranges from 19.1% to 49.8%. A study from Shashemene of Oromia regional state reported that 49.8% of women avoid one or more food items during pregnancy. These include linseed, honey and milk/yoghurt were commonly avoided food items. Moreover, more than one-third (38.3%) of pregnant women practice fasting during pregnancy, which restricts meat and dairy products.

Pregnant women use herbs, believing it will make them strong and healthy. In addition, studies showed that pregnant women use herbs due to lack of effectiveness in the conventional treatments and perceiving that they are safer. A study conducted in Gonder showed that 48.6% of women used herbal medicines during pregnancy. The most commonly used herbs were ginger (Zingiber officinale) (40.7%) and damakasse (Oximum lamiifolium) (38.4%). Unfortunately, most of the women (89.8%) used these herbals without consulting their doctors.

Previously conducted studies showed that various factors could be associated with harmful traditional practices during pregnancy. These factors include the educational status of the mother, place of delivery, maternal age, parity, antenatal care (ANC) utilisation, marital status, place of residence and age at marriage.

Ethiopia, especially the Southern region, is one of the countries with various traditional practices around the world. These traditional practices could be useful or harmful. Though different studies were conducted previously on the topic, it is obvious that harmful traditional practices vary from region to region. However, such data are lacking in the study area. Identifying the existing harmful traditional practices and their determinants in the area is critical to designing appropriate interventions in the future. Therefore, this study aimed to assess the prevalence of harmful traditional practices during pregnancy and associated factors in southwest Ethiopia.

**METHODS**

**Study area and design**

A community-based cross-sectional study was conducted in four zones of Southwest Ethiopia, namely Bench-Shako, West-Omo, Sheka and Kafa Zones in 2019. A total population of around 2 million dowels in this zone, with nearly half of the population, being female. Regarding the health infrastructure, there are about 5 hospitals; 1 teaching and referral, 1 zonal level and another primary district hospital, with more than 80 health centres.

**Source population**

All reproductive age group women who live in the study area and had at least one pregnancy.

**Study population**

All reproductive age group women who live in the study area who were pregnant at the time of data collection or were pregnant at least once within 2 years prior to the study.

**Exclusion criteria**

Women who lived in the study area for less than 6 months were excluded.

**Sample size determination**

The required sample size was calculated by using a single population proportion formula, considering the following assumption: 95% CI, 4% margin of error, 1.5 design effect, a non-response rate of 10% and prevalence of traditional harmful practice during pregnancy was 22%. Accordingly, a total of 680 women were selected for this study.

**Sampling procedure**

A multistage sampling technique was used to select the study participants. First, four Woredas were selected using a lottery method. Then, eight kebeles from the four Woredas were selected randomly. After this, the sample size was proportionally allocated based on their population size. Then, households with currently or previously pregnant women were identified from a family folder with the help of health extension workers and a sampling frame was prepared. Finally, the study participants were selected randomly by using computer-generated random numbers.

**Measurement variables**

**Harmful traditional practices**

Harmful traditional practices include abdominal massage, food taboos and intake of herbs done on/by pregnant women without a health professional’s instruction.

**Independent variables**

**Sociodemographic variables**

Age, religion, maternal education, marital status, partner’s educational status, residence.

**Obstetric variables**

Parity, ANC utilisation, place of delivery for the most recent birth, history of abortion, history of stillbirth, history of child death.

**Data collection procedures and instruments**

The data collection was conducted by BSc nurses, midwives and health extension workers using a semistructured questionnaire that was prepared in the Amharic language. It was administered using of face-to-face interview. The questionnaires were prepared after reviewing related literature. They contain three parts; sociodemographic characteristics of participants, previous obstetric history and harmful traditional practices during pregnancy. After the questionnaires were prepared, their reliability was checked using Cronbach’s alpha. The result...
showed that Cronbach’s alpha for the questionnaires was 0.87. Therefore, the questionnaires had acceptable reliability.

**Data quality control**

The questionnaire was first developed in English, then translated to Amharic language and again translated back to the English language to maintain its consistency. A pretest was also done on 5% of the sample size. Training was given to data collectors and supervisors regarding the objectives of the study, data collection method and tools. During data collection time, each data collector was closely supervised and the completeness of the questionnaires was checked.

**Data analysis**

Data were coded, entered, cleaned and checked by Epi Data entry manager V.4.0.2, and analysis was done by using SPSS V.22. Following descriptive analysis, binary logistic regression was conducted to identify the association between dependent and independent variables at a significance level of \( p \leq 0.25 \). All variables with \( p \leq 0.25 \) were entered into a multiple logistic regression model. Variables with a \( p \leq 0.05 \) in the multiple logistic regression were considered as the determinants of the outcome variable. The model fitness was checked using Hosmer and Lemeshow test (\( p=0.774 \)). The independent variables were checked for multicollinearity using tolerance and variance inflation factor (VIF). None of the variables had a tolerance value of \(<0.1\) or a VIF value of \(\geq 10\).

**Patient and public involvement**

It was not possible to involve patients or the public in the design, or conduct, or reporting, or dissemination plans of our research.

**RESULTS**

### Sociodemographic characteristics of the study participants

Out of 680 women, 667 (98% response rate) women participated in this study. Nearly half (48.3%) of the respondents were between 25 and 29 years old. A majority (95.7%) of the study participants were married, and 45.6% of the respondents were housewives. Regarding education, 57.4% of the participants did not attain formal education. Two hundred and seventy (40.5%) women were Orthodox Christians. The husbands of 393 (58.9%) women attained primary education. About 480 (72%) women were residents of rural areas (table 1).

### Obstetric-related characteristics of the respondents

Of the total 667 of study participants; 550 (82.5%) of them were multiparas and 637 (95.5%) of them used ANC services during their last pregnancy. Regarding the place of birth, 613 (91.9%) women gave birth to their last child in health institutions. Sixty-four (9.6%) mothers had a history of abortion, 132 (19.8%) mothers had a history of child death and 25 (3.7%) had a history of stillbirth (table 2).

**Prevalence and types of harmful traditional practices during pregnancy**

Two hundred and forty-seven (37%, 95% CI (33.4% to 40.8%)) mothers practised harmful traditional practices at some point in their pregnancy. The most commonly practised activities were abdominal massage (72.9%), intake of herbs (63.9%) and food taboos (48.6%). All the women exposed to abdominal massage stated that the procedure was performed by untrained personnel. In addition, 112 (62.2%) of them mentioned that the abdominal massage was conducted during the third
trimester of their pregnancy. Women who experienced food prohibition mentioned that honey (46.6%) and milk (43.3%) were the most commonly averted food items during pregnancy. Seventy-three (46.2%) of the respondents responded that they take herbs to enhance labour while 57 (36.1%) used herbs to relieve pain (table 3).

Factors associated with harmful traditional practices during pregnancy

Binary and multiple logistic regression was conducted to identify factors associated with harmful traditional practices during pregnancy. In the binary regression parity, ANC utilisation during last pregnancy, history of child death, monthly income, history of stillbirth, place of delivery and maternal educational status were found to be significantly associated with the outcome variable. These variables were entered into a multiple logistic regression model for further analysis. In the final model, monthly income of less than ETB1000, lack of formal education, being multipara, having of ANC visits and having no history of child death were significantly associated with harmful traditional practices during pregnancy.

Multipara women were 53% (Adjusted Odds Ratio (AOR)=0.47, 95% CI (0.27 to 0.80), p=0.003) less likely to practice harmful traditional practices than primipara women. Women with no history of child death were 2.74, (AOR=2.74, 95% CI (1.75 to 4.29), p<0.001) times more likely to engage in harmful traditional practices during pregnancy than women with a history of child death. Women with no formal education were 4.81 (AOR=4.81, 95% CI (2.50 to 9.23), p<0.001) more likely to conduct harmful traditional practices than women with tertiary education. Women who had ANC visits during their last pregnancy were 76% (AOR=0.24, 95% CI (0.10 to 0.59), p=0.002) less likely to practice harmful traditional practices than women with no ANC visits. Mothers with a monthly income of less than ETB1000 were 3.13 (AOR=3.13, 95% CI (1.83 to 5.37), p<0.001) times more likely to exercise harmful traditional practices than women with a monthly income of greater than ETB2000 (table 4).

DISCUSSION

Our study showed that 37% of women in Southwest Ethiopia practised harmful traditional practices while they were pregnant. Abdominal massage, intake of herbs and food taboos were the most commonly identified harmful traditional practices during pregnancy. Multiple logistic

| Variables                  | Frequency | %   |
|----------------------------|-----------|-----|
| Primipara                  | 117       | 17.5|
| Multiparas                 | 550       | 82.5|
| ANC utilisation            |           |     |
| Yes                        | 637       | 95.5|
| No                         | 30        | 4.5 |
| History of abortion        |           |     |
| Yes                        | 64        | 9.6 |
| No                         | 603       | 90.4|
| Place of birth for the most recent birth | | |
| Health facility            | 613       | 91.9|
| Home                       | 54        | 8.1 |
| History of child death     |           |     |
| Yes                        | 132       | 19.8|
| No                         | 535       | 80.2|
| History of stillbirth      |           |     |
| Yes                        | 25        | 3.7 |
| No                         | 642       | 96.3|

ANC, antenatal care.

| Variables                          | Frequency | Percentage % |
|------------------------------------|-----------|--------------|
| HTPs performed during pregnancy (n=667) | | |
| Yes                                | 247       | 37           |
| No                                 | 420       | 63           |
| HTPs performed during pregnancy(n=247)* | | |
| Abdominal massage                  | 180       | 72.9         |
| Food taboo                          | 120       | 48.6         |
| Drinking herbs                      | 158       | 63.9         |
| Time of abdominal massage was performed (n=180) | | |
| First trimester                     | 17        | 9.4          |
| Second trimester                    | 51        | 28.4         |
| Third trimester                     | 112       | 62.2         |
| Personnel performed abdominal massage (n=180) | | |
| Untrained traditional birth attendants | 88      | 48.9         |
| Neighbours                          | 57        | 31.7         |
| Family                              | 35        | 19.4         |
| Food items avoided during pregnancy (n=120) | | |
| Milk/yoghurt                        | 52        | 43.3         |
| Egg                                 | 32        | 26.6         |
| Meat                                | 26        | 21.6         |
| Honey                               | 56        | 46.6         |
| Casava                              | 35        | 29.2         |
| Other (fruits, honey linseed and vegetables) | 17 | 14.2 |
| Reasons for intake of herbs (n=158) | | |
| To enhance labour                   | 73        | 46.2         |
| To keep the fetus healthy           | 24        | 15.2         |
| To relieve pain                     | 57        | 36.1         |
| Other (prevent constipation & vomiting) | 4       | 2.5          |

*Multiple responses were possible.
regression analysis showed that monthly income of less than ETB1000, lack of formal education, having no ANC visits, having no history of child death and multiparous women were significantly associated with being involved in traditional practices during pregnancy.

In the current study, more than one-third of mothers who participated in the study reported practising harmful traditional practices while they were pregnant. This finding was lower than the studies conducted in a Gurage zone and Meshenti Town, while higher than a study conducted in Wonago town. This difference between the current and other studies could be explained by the fact that different traditional practices might be practised in different areas.  

Abdominal massage during pregnancy is considered as a ‘silent killer’, which can result in maternal and perinatal mortality in addition to various obstetric complications. Unfortunately, abdominal massage was performed on 72.9% of our participants by untrained personnel. This finding was higher than the findings of the studies conducted in Amhara and Afar regions. About 62.2% of them mentioned that the procedure was performed during the third semester of their pregnancy, which could have resulted in placenta previa, abruptio placenta, retained placenta, uterine rupture on the top of maternal and perinatal mortalities. 

The nutritional need of pregnant women is higher than that of non-pregnant women due to the numerous changes required to ensure healthier maternal and fetal development. Moreover, interventions designed to optimise pregnancy outcomes and promote healthy infant growth and development during the first 1000 days (from conception to the child reaches age 2 years) will also reduce chronic disease risk. Therefore, it is recommended for pregnant women to eat balanced diets including vitamins, minerals and omega-3 fatty acids. In contrast to this, our study showed that 48.6% of women avoided nutritious foods (dairy products, meat, eggs, honey, vegetables and fruits) during their pregnancy. This could result in preterm birth and low birth weight. This finding was higher than the findings of the studies conducted in a Gurage zone, Amhara and Afar regions while lower than a study conducted in Wonago town.

One hundred and fifty-eight (63.97%) women reported that they have used herbs during their pregnancy. This finding was higher than the findings of a study conducted in a Gurage zone which showed that 46.7% and 47.9% of women drink ‘Koso’ and ‘Telba’, respectively, during the perinatal period. Women may use herbs during pregnancy to treat various health conditions. These include nausea, vomiting, common cold, urinary tract infection and shortening labour. However, pregnant women can be vulnerable to the adverse effects of these substances as their dosage and safety are not well established. In addition, pregnant women may not inform their physicians about their use of herbs since most of them believe that they are safe. Evidence showed that herbal medications may cause heartburn, premature labour, miscarriage, increased blood flow and allergic reactions during pregnancy. Therefore, pregnant women should be cautious while using herbs to avoid these consequences. The difference between the current and other studies in terms of the prevalence of abdominal massage, food taboos and the use of herbs could be explained by the fact that different traditional practices might be practised in different areas.

Our study showed that mothers who did not attain formal school were more likely to engage in harmful practices than mothers with tertiary education. Previously conducted studies also showed that a lack of formal education increases the probability of practising harmful traditional practices. This could have resulted from the fact that education enables pregnant women to abide by healthy practices. In addition, educated women might also have higher income, which in turn increases their exposure to health-related information.

### Table 4 Factors associated with harmful traditional practices during pregnancy

| Variable                      | COR (95% CI) | AOR (95% CI) | P value |
|-------------------------------|--------------|--------------|---------|
| Parity                        |              |              |         |
| Multipara                     | 0.40 (0.25 to 0.64) | 0.47 (0.27 to 0.80) | 0.003   |
| Primipara                     | 1            | 1            |         |
| Residence                     |              |              |         |
| Rural                         | 0.62 (0.43 to 0.89) | 0.72 (0.46 to 1.12) | 0.055   |
| Urban                         | 1            | 1            |         |
| ANC visits during last pregnancy |            |              |         |
| No                            | 1            | 1            |         |
| Yes                           | 2.67 (1.26 to 5.64) | 0.24 (0.10 to 0.59) | 0.002   |
| History of child death        |              |              |         |
| No                            | 3.93 (2.67 to 5.95) | 2.74 (1.75 to 4.29) | <0.001  |
| Yes                           | 1            | 1            |         |
| Monthly income                |              |              |         |
| <1000 ETB                     | 3.19 (2.04 to 5.04) | 3.13 (1.83 to 5.37) | <0.001  |
| 1001-2000ETB                  | 1.30 (0.91 to 1.87) | 1.37 (0.91 to 2.07) | 0.240   |
| >2000ETB                      | 1            | 1            |         |
| History of stillbirth         |              |              |         |
| Yes                           | 0.21 (0.89 to 0.52) | 0.39 (0.14 to 1.05) | 0.081   |
| No                            | 1            | 1            |         |
| Place delivery                |              |              |         |
| Home                          | 0.56 (0.32 to 0.97) | 0.60 (0.30 to 1.20) | 0.180   |
| Institution                   | 1            | 1            |         |
| Maternal educational status   |              |              |         |
| No education                  | 2.30 (1.34 to 3.95) | 4.81 (2.50 to 9.23) | <0.001  |
| Primary education             | 0.84 (0.47 to 1.49) | 1.44 (0.73 to 2.81) | 0.347   |
| Secondary education           | 0.96 (0.44 to 2.08) | 1.26 (0.53 to 3.002) | 0.724   |
| Tertiary education            | 1            | 1            |         |
| ANC, antenatal care; AOR, Adjusted Odds Ratio; COR, Curde Odds Ratio. |
Pregnant women with lower economic status (monthly income of <ETB1000) were more likely to practice harmful traditional practices than women with a monthly income of greater than ETB2000. These could be explained by the fact that women with lower economic status might not attain formal education. This might hinder them from exercising healthy lifestyles during pregnancy. In addition, this group of women might not get health education as a result of poor healthcare access. Women who had ANC visits were less likely to practice harmful traditional practices than women who had no ANC visits. This finding was comparable with a finding of a study conducted in a Gurage zone. A study conducted in Amhara region also showed that women who had no ANC follow-ups were up to two times more likely to practice cultural malpractices during labour and delivery. These findings indicated that ANC visits have a positive impact on reducing harmful traditional practices during pregnancy. The possible justification could be women who had ANC visits could get aware of the risks of harmful traditional practices during pregnancy.

Women who had a history of child death were less likely to practice harmful traditional practices during pregnancy than women who had no history of child death. This might be due to the fact that women with adverse pregnancy outcomes, including a child death, are more likely to seek maternal health services, which might reduce harmful traditional practices. Multipara women were less likely to practice harmful traditional practices than primipara women. This could be explained by the fact that multipara women might avoid traditional practices during pregnancy due to repeated exposure to health information.

The findings of this study should be interpreted with precaution due to its limitations. Due to the nature of the study design (cross-sectional), it was impossible to establish a temporal relationship between the independent and dependent variables. The study might be subjected to recall bias, since women who gave birth 2 years before the study were included.

Conclusions

Despite the advancements in medical science in the past decades, a significant proportion of pregnant women continue to practice harmful traditional practices in Southwest Ethiopia. Abdominal massage, intake of herbs and food taboos were the most commonly practised harmful traditional practices in the area. The harmful traditional practices were more prevalent among primiparas, women with no formal education, women with no history of child death, women with no ANC follow-ups and women with lower monthly income. Our study showed that more than one-third of women in the study area were exposed to some forms of harmful traditional practices while they were pregnant. This indicated that different measures need to be taken to avert these practices. Therefore, health professionals should use community health programmes and ANC visits to educate mothers about the negative consequences of harmful traditional practices. They should also work with community members, such as community and religious leaders, to change the community’s attitude towards harmful traditional practices during pregnancy. Researchers should explore further harmful traditional practices during pregnancy and recommend possible areas of intervention. They should also determine the short and long-term impacts of harmful traditional practices on mothers and their newborns.

REFERENCES

1. WHO, Group WB. Trends in maternal mortality: 1990 to 2015, 2015
2. Legesse T, Abduliham M, Dirar A, Press D. Trends and causes of maternal mortality in Jimma university specialized Hospital, Southwest Ethiopia: a matched case-control study. Int J Womens Health 2017;9:307–13.
3. Gedamu H, Tsegaw A, Debebe E. The prevalence of traditional malpractice during pregnancy, child birth, and postnatal period among women of childbearing age in Mesenhet town, 2016. Int J Reprod Med 2018;2018:1–7.
4. Withers M, Associate MHS, Khazrani N. Traditional beliefs and practices in pregnancy, childbirth and postpartum : A review of the evidence from Asian countries. Midwifery 2017;2018:158–70.
5. Ms U, Japhet E, Es U. Blunt Abdominal Trauma during Pregnancy in Nigeria : Causes Obstetric Complications and Pregnancy Outcome. iMedPub Journals 2016:1–5.
6. Adokiye E, Isioma A, Levi W. Influence of Culturally-based abdominal massage and antenatal care uptake among pregnant women in a tertiary hospital in southern Nigeria. Br J Med Med Res 2016;18:1–9.
7. Mesele HA, Anatomy & Physiology : Current Traditional Maternal Health Beliefs and Practices in Southern Tigray. The Case of Raya Alamata District 2018:8:1–12.
8. Otoo P, Habib H, Ankormah A. Food Prohibitions and Other Traditional Practices in Pregnancy : A Qualitative Study in Western Region of Ghana 2015:41–9.
Open access

9 * BO*, Yasemin DURDURAN NDK. Traditional practices of Konya women during pregnancy, birth, the postpartum period, and newborn care 2020:501–11. doi:10.3906/sag-1504-120

10 Ayaz S. The European Journal of Contraception & Reproductive Potentially harmful traditional practices during pregnancy and postpartum 2008.

11 Catherin N, B R, V R, Rock B, Roger V, et al. Beliefs and practices regarding nutrition during pregnancy and lactation in a rural area in Karnataka, India: a qualitative study. *Int J Community Med Public Health* 2015;2:116–20.

12 Kuzma J, Paofa D, Kaugla N. Food taboos and traditional customs among pregnant women in Papua New Guinea: Missed opportunity for education in antenatal clinics 2013;19:1–11.

13 Tola TN, Tadesse AH. Cultural Malpractices during pregnancy, child birth and postnatal period cultural Malpractices during pregnancy, child birth and postnatal period among women of child bearing age in Limmu Genet town Southwest Ethiopia. *Malpractice* 2015.

14 Biza Zepro N, Zepro NB. Food Taboos and misconceptions among pregnant women of Shashemene district, Ethiopia, 2012. *SJPH* 2015;3:410–6 https://www.sciencepublishinggroup.com/journal/paperinfo.aspx?journalid=251&doi=

15 Fakeye TO, Adisa R, Musa IE. Attitude and use of herbal medicines among pregnant women in Nigeria. *BMC Complement Altern Med* 2009;9:53.

16 Mekuria AB, Erku DA, Gebresillasie BM, et al. Prevalence and associated factors of herbal medicine use among pregnant women on antenatal care follow-up at University of Gondar referral and teaching Hospital, Ethiopia: a cross-sectional study. *BMC Complement Altern Med* 2017;17:1–7.

17 Abebe H, Beyene GA, Mulat BS. Harmful cultural practices during perinatal period and associated factors among women of childbearing age in southern Ethiopia: community based cross-sectional study. *PloS One* 2021;16:e0254095.

18 Zenebe* K*, Alem H, Merga A. Gynecology & Obstetrics Prevalence of Cultural Malpractice and Associated Factors Among Women Attending MCH Clinic at Debretabor Governmental Health Institutions 2016;6:2015–7.

19 Ayaz S, Efe SY, Yaman Efe S. Potentially harmful traditional practices during pregnancy and postpartum. *Eur J Contracept Reprod Health Care* 2008;13:282–8.

20 Kassahun G, Wakgari N, Abraham R. Patterns and predictive factors of unhealthy practice among mothers during pregnancy, childbirth, postnatal and newborn care in southern Ethiopia: a community based cross-sectional study. *BMC Res Notes* 2019;12:594.

21 Ugbooma HAA, Akani CI. Abdominal massage: another cause of maternal mortality. *Niger J Med* 2004;13:259–62.

22 Melesse MF, Bitewa YB, Dessie KN, et al. Cultural malpractices during labor/delivery and associated factors among women who had at least one history of delivery in selected zones of Amhara region, North West Ethiopia: community based cross-sectional study. *BMC Pregnancy Childbirth* 2021;21:504.

23 Ebabu AA, Muhammed MA. Traditional practice affecting maternal health in Pastoralist community of afar region Ethiopia: A Facility-Based Cross-Sectional Study 2021;4. doi:10.22038/JMRH.2021.46790.1575

24 Jouanne M, Oddoux S, Noël A, et al. Nutrient requirements during pregnancy and lactation. *Nutrients* 2021;13:692 https://pubmed.ncbi.nlm.nih.gov/33670026

25 Adair LS. Long-Term consequences of nutrition and growth in early childhood and possible preventive interventions. Nestlé Nutrition Institute Workshop Series, 2014: 111–20. https://www.karger.com/DOI/

26 Desta M, Getaneh T, Memiah P, et al. Is preterm birth associated with intimate partner violence and maternal malnutrition during pregnancy in Ethiopia? A systematic review and meta analysis. *Heliyon* 2021;7:e08103 https://pubmed.ncbi.nlm.nih.gov/34926844

27 Berhe K, Weldegerima L, Gebrearegay F, et al. Effect of under-nutrition during pregnancy on low birth weight in Tigray regional state, Ethiopia: a prospective cohort study. *BMC Nutr* 2021;7:72.

28 Builders TLE- PF. Herbal medicine use during pregnancy: benefits and untoward effects. in Rijeka. *IntechOpen* 2019.

29 Becker G, Newsom E. Socioeconomic status and dissatisfaction with health care among chronically ill African Americans. *Am J Public Health* 2003;93:742–8 https://pubmed.ncbi.nlm.nih.gov/12721135

30 Rosário EVN, Gomes MC, Brito M, et al. Determinants of maternal health care and birth outcome in the Dande health and demographic surveillance system area, Angola. *PLoS One* 2019;14:e0221280.

31 Chaka EE. Multilevel analysis of continuation of maternal healthcare services utilization and its associated factors in Ethiopia: a cross-sectional study. *PLOS Glob Public Health* 2022;2:e0000517.