



ORIGINAL ARTICLE

Practice of Hot Abdominal Compression among Parturient Women at the University College Hospital, Ibadan, Nigeria

Awolude OA¹, Olagunju AS², Agbana RD³

¹Department of Obstetrics and Gynaecology, College of Medicine, University of Ibadan/ University College Hospital, Ibadan, Nigeria

²Department of Obstetrics and Gynaecology, University College Hospital, Ibadan, Nigeria

³Department of Community Medicine, Afe Babalola University, Ado Ekiti, Nigeria

Keywords:

Abdomen,
Hot
compress,
Parturient,
Culture,
Practice

ABSTRACT

Background: The postpartum period is an important period of excitement with the arrival of the newborn. The body then starts physiological adaptations to revert to the pregnancy states. These physiological adaptations can be associated with some cultural practices like hot abdominal compress (HAC) which may have harmful effects such as hot water burns, abdominal wrinkling and darkening. This study assessed the practice of HAC among mothers seen at the postnatal clinic of the University College Hospital (UCH), Ibadan, Nigeria.

Methods: This was a cross-sectional study among 290 postpartum women recruited consecutively at the postnatal clinic in UCH between 1st December 2015 and 29th February 2016. Data collection was by pretested self-administered questionnaire and was analyzed using SPSS version 22.0. p value was set at < 0.05.

Results: The participants' mean age was 31.88 (SD± 5.1 years), 97.2% of the women had ANC in formal setting and 53.8% had vaginal delivery. Of the 290 participants, 264 (91.0%) were aware of HAC and 51.7% practiced HAC. The return of uterus to normal size (34.7%) and mothers' encouragements (24.7%) were the commonest reason for practice of HAC. Mothers' and mothers-in-law' assisted with HAC in 46.2% and 36.6% of cases, respectively. More vaginally-delivered women practiced HAC (p < 0.001).

Conclusion: This study showed that practice of postpartum HAC is high and the reasons for the practice are more of tradition and cultural beliefs. There is need for more studies to better understand this culturally deep-rooted practice.

Correspondence to:

Dr. Olotun A. Awolude
Department of Obstetrics and Gynaecology,
College of Medicine, University of Ibadan/University College Hospital, Ibadan, Nigeria
Email: tosinawolude@yahoo.com
Telephone: +2348032222986

INTRODUCTION

The postpartum period represents an important period in the life of parturient women with different feelings depending on the outcome. It is a critical transitional time for the woman, her newborn and her family on a physiological, emotional and social level.¹ It is the period when delivered mothers are recovering from their delivery and are beginning to care for the newborn.¹⁻³ The

newly delivered mothers spend the first 2-5 days after delivery in the hospital depending on whether it is vaginal or caesarean delivery.⁴ While still in the hospital, the mother is monitored for blood loss, signs of infection, abnormal blood pressure, contraction of the uterus and ability to void. It is believed that most of the changes of pregnancy, labour and delivery would have resolved by the end of the puerperium and the body would have reverted to the non-pregnant state.³

One of such physiological puerperal changes is uterine involution. The uterus which weighs over 1000g immediately after delivery undergoes physiological process of involution to return to pre-pregnancy size of about 50g by the end of puerperium. This process is physiologically facilitated in mothers by oxytocin release in response to stimuli like suckling by the babies in mothers that breastfeed.⁵ The oxytocin, in addition to promoting milk let-down, enhances myometrial contractions that help maintain uterine muscle tones facilitating involution. Uterine involution occurs in a decreasing logarithmic scale with the greatest change occurring during the first 30 days of delivery and later, the involution decreases steadily till the end of puerperium.⁵ The rate of involution depends on several factors such as nutrition of the mother and if the mother is breastfeeding a baby or not.⁵ The process is completed in about four weeks in mothers that breastfeed and about six weeks in non-breastfeeding mothers.⁴

However, the puerperal period can be one of the most medically neglected periods that receives relatively less attention than pregnancy and delivery with resultants increased contributions to maternal morbidities and mortalities.^{6,7} There can be a mixture of care between traditional and modern care, with some parturient women operating at the traditional end, others at the modern end, with the majority somewhere in between.⁸ Many studies have described traditional beliefs and practices surrounding childbearing.^{9,10} While some traditional practices are beneficial to the mother and baby, some other practices are not. Certain practices that are considered beneficial and culturally acceptable or with symbolic importance to local people, but which may be harmful are associated with the puerperal period.⁶ These traditional practices and home remedies are often promoted by grandmothers, village

healers, midwives, community leaders and medical quacks.^{6,8}

One of such practices is hot compress, a practice in which a soft, absorbent cloth folded into several layers, dipped in hot water, barely wrung out is placed on the part to be treated.¹¹ It is aimed at promoting local pain relief and muscular relaxation.⁶ It is otherwise referred to as hot fomentation. A specific practice of this procedure in obstetrics is Hot Abdominal Compress (HAC) in which the hot compress is on the abdomen or caesarean section site of delivered mothers to encourage uterine involution.¹⁰ This widely practiced postpartum procedure has been described to be associated with conditions like wrinkling of the skin, burns injury to the skin, darkening of the skin, and surgical site infection which would cause wound break down thus, increasing maternal morbidity and mortality.⁶ Hot abdominal compress has also been associated with erythema and blisters of the skin of the abdomen and unwanted masking of pain which can delay diagnosis and treatment of other puerperal problems like pelvic infection which pain might be one of the earliest symptoms.⁶

In Nigeria and other low and middle-income countries (LMIC), illiteracy, poverty, native customs and cultural beliefs with paucity of health care facilities and personnel compound the problems of the postpartum period in women. These might promote cultural practices that have no medical benefits in these women.¹² Antenatal care (ANC) period represents one way of overcoming these harmful practices by incorporating ways to prevent these practices into counselling sessions for expectant mothers. The antenatal care is a holistic, systematic, and evidence-based approach to care during pregnancy with the target of ensuring the well-being of the woman and fetus in pregnancy, delivery and puerperium by enhancing women's positive posture towards childbirth, postpartum care

and safe starting point for the new born child.¹³ However, in most LMIC of the world, antenatal clinics where a number of these preventive practices with sound scientific evidences are taught and demonstrated to mothers are poorly attended by pregnant women.¹⁴ This leaves many of the pregnant women to be taught by their mothers, mothers-in-law, and peers using culturally handed-down practices with no scientific evidence. The implication of this is the negative effects on efforts at reducing the high maternal morbidity associated with such highly prevalent but poorly researched unorthodox postpartum practices like HAC.

Thus, this study aimed to further study the practice of this age-long, traditional and culturally deep hot abdominal compress (HAC) of postpartum women in a tertiary health facility in Ibadan, a South West city in Nigeria to add to the limited global data on the subject that might improve the quality of maternity care in our environment.

METHODOLOGY

This was a cross-sectional study conducted at the postnatal clinic of University College Hospital (UCH), Ibadan, Oyo state, Nigeria, a tertiary and referral centre for other tertiary, general, cottage, primary and private hospitals in the state and other parts of Nigeria. The study participants were women presenting for postnatal care at the hospital six weeks post-delivery. These participating mothers included women who had deliveries in UCH irrespective of where the antenatal care took place. Such participants included women who had their antenatal care in UCH and delivered in UCH, women who delivered in UCH following emergency presentation without prior antenatal care in UCH and women presenting for postnatal care in UCH with prior antenatal care in UCH but delivered outside UCH. Consecutive consenting participants from these eligible parturient had self-administered questionnaire until the pre-calculated sample size of 300, based on the

anticipated number of parturient expected in the postnatal clinic over 3 months reviewing the previous year's record, was reached between 1st December 2015 and 29th February 2016. Trained research assistants aided where necessary.

The questionnaire was pre-tested in the maternity unit of a secondary level of health care about 2km away from UCH. Information collected included age, occupation, tribe, educational status, religion, marital status, parity, booking status, mode of delivery, place of delivery, awareness and practice of hot compress and reasons for/for not practicing hot compress.

The data was entered and analyzed by descriptive and inferential statistics using statistical software (SPSS) version 22.0. The chi-square test was applied for comparison of proportions and for evaluating associations of categorical variables in contingency tables. Statistical significance was set at p-value < 0.05.

This study was approved by Oyo State Research and Ethics committee as part of study assessing covert contraceptive and postpartum hot abdominal compress use and written informed consent was obtained from each of the participants. The privacy/confidentiality of the patients was maintained, as well as anonymity throughout the study and even after concluding the study.

RESULTS

A total of 290 of the 300 questionnaires administered were found suitable for analysis (96.7% response rate). The mean age of the respondents was 31.88±5.1 years with majority, 211 (72.8%) between 26–35 years. One hundred and three (35.5%) of the respondents were first degree holders. The educational distribution of the respondents is as shown in Table 1. Two hundred and eighty-six (98.6%) of the respondents were married and 120 (41.4%) were civil servants. Other occupations are as shown in Table1. The parity

of the respondents ranged from 1 to 6 with a mode of 2. One hundred and eighty (62.1%) of the respondents had their antenatal care at a general hospital but were referred to the tertiary facility (UCH) for management of pregnancy complications. Only 102 (35.2%) of respondents primarily booked at UCH (Tertiary hospital). Vaginal delivery was the most common mode of delivery and occurred in 156 (53.8%) of the respondents, emergency caesarean section occurred in 79 (27.2%) while elective caesarean section occurred in 55 (19.0%) of them.

Two hundred and sixty-four (91.0%) of respondents were aware of hot abdominal compression while 150 (51.7%) of the respondents practiced HAC. This figure will represent 56.8% of those aware of the practice of HAC (150/264). Fifty-two (34.7%) of the respondents that practiced HAC did so because of the believe that it helps the uterus to return to normal size, while 37 (24.7%) did it because their mothers encouraged them to do it, 19 (12.8%) did it as a family tradition, 18 (12.0%) because it is believed to help flattened out the abdomen, 14 (9.2%) because it is believed to help with the lochia flow and 8 (5.3%) believed it has some pain relief advantage. Among the respondents that practiced HAC, assistance was rendered by their mothers 69 (46.2%), mother-in-law 55 (36.6%) while in 26 (17.2%) of them HAC was self-performed (Table 2). For those who did not practice HAC, the fear of abdominal darkening was the commonest reason in 60 (52.6%), abdominal wrinkling in 42 (36.8%), and fear of physical abdominal injuries like burns in 6 (5.3%) while another 6 (5.3%) had no reason.

Bivariate analysis to determine the association between practice of HAC and socio-demographic and obstetric variables showed that age ($p=0.366$) occupation ($p=0.375$),

Table 1: Socio-demographic and obstetric characteristics of parturient women

Variable	Frequency (n=290)	Percent
Age		
≤25	17	5.9
26-35	211	72.8
36-45	60	20.7
≥ 46	2	0.7
(Mean Age = 31.88 ± 5.1 years)		
Occupation		
Student	16	5.5
Housewife	25	8.6
Trader	76	26.2
Civil servant	120	41.4
Others	53	18.3
Religion		
Christianity	226	77.9
Islam	64	22.1
Level of Education		
Primary	6	2.1
Secondary	31	10.7
Tertiary	253	87.2
Marital status		
Married	286	98.6
Not married	4	1.4
Tribe		
Yoruba	254	87.6
Igbo	20	6.9
Bini	12	4.1
Hausa	4	1.4
Parity		
1	66	22.8
2-4	217	74.8
≥5	7	2.4
Modal Parity = 2		
Place of Antenatal Care		
Non-formal		
Mission Home	6	2.1
Traditional Birth Attendant	2	0.7
Formal		
General Hospital	180	62.1
Tertiary Hospital	102	35.2
Mode of Delivery		
Vaginal Delivery	156	53.8
Caesarean Delivery		
Emergency Caesarean Section	79	27.2
Elective Caesarean Section	55	19.0

religion ($p=0.412$), education ($p=0.087$), tribe (0.067), parity ($p=0.296$) and place of ANC ($p=0.335$) of the parturient women were not associated with practice of HAC. The mode of delivery, however, showed statistically significant influence on the practice of HAC as women who had vaginal delivery 120 (76.9%)

Table 2: Respondents' practice of Hot Abdominal Compress

Variables	Frequency	Percent
Awareness of HAC (n=290)		
Aware	264	91.0
Not aware	26	9.0
Practice of HAC (n=290)		
Yes	150	51.7
No	140	48.3
Reasons for Practicing HAC (n=150)		
Helps womb to return to normal size	52	34.7
Mother encouraged me	37	24.7
It is a family tradition	19	12.8
Abdomen flattened out	18	12.0
Plenty blood got drained through the vagina	14	9.2
It helped relief abdominal pain after delivery	8	5.3
Other Benefits	2	1.3
Assistance with Practice of HAC (n=150)		
Mother	69	46.2
Mother-in-law	55	36.6
Self	26	17.2
Reasons for not Practicing HAC (n=140)		
Increased darkening of the skin	60	42.9
Abdominal Wrinkling	42	30.0
Not Aware of HAC	26	18.6
Physical Abdominal Injuries like burns	6	4.3
No reason	6	4.3

significantly practiced HAC more than those who emergency 20 (25.3%) or elective 10 (18.2%) Caesarean Section ($p<0.001$). (Table 3)

DISCUSSION

Postpartum practices are many and vary geographically. Some can be beneficial, some innocuous while some are harmful. While the beneficial ones deserve continuation through promotion by counselling, the harmful ones should be discouraged. Understanding such traditional beliefs and practices of individuals, families, and society served by health care professionals is important.¹⁵ Hot abdominal compress (HAC) is an example of common traditionally hinged postpartum practice in Nigeria with, unfortunately, no clinical benefits and should be discouraged. It is an old tradition used to aid anterior abdominal muscle tone and lochia drainage ⁵ though, there is no evidence to support this.

In this study, majority of the women interviewed were aware of HAC with half of them practicing it. This proportion of parturient practicing HAC in this study is lower than the 80.2% postpartum women who practiced HAC in a study on postpartum practice of parturient women in Enugu, South East Nigeria.⁶

This might be due to differences in the educational attainments, especially tertiary education of the respondents from the two studies. In the Enugu study, 2.4% of the respondents had no formal education and only 28.6% had tertiary education compared with respondents with 100% formal education and 87.2% with tertiary education in our study. Also, the temporal time difference between the two studies can contribute to this difference. This educational status might also be an important factor responsible for most of the respondents in this study seeking maternity care at secondary and tertiary health institutions.

Table 3: Association between socio-demographic/obstetric characteristics and practice of HAC

Variable	Practice of HAC		Chi square	p-value
	Yes (n=150) n (%)	No (n=140) n (%)		
Age				
≤25	11 (64.7)	6 (35.3)	3.172	0.366
26-35	107 (50.7)	104 (49.3)		
36-45	30 (50.0)	30 (50.0)		
≥46	2 (100.0)	0 (0.0)		
Occupation				
Student	6 (37.5)	10 (62.5)	4.238	0.375
Trader	46 (60.5)	30 (39.5)		
Civil servant	60 (50.0)	60 (50.0)		
Housewife	13 (52.0)	12 (48.0)		
Others	25 (47.2)	28 (52.8)		
Religion				
Christianity	114 (50.4)	112 (49.6)	0.674	0.412
Islam	36 (56.3)	28 (43.8)		
Level of Education				
≤ Secondary	24 (64.9)	13 (35.1)	2.933	0.087
Tertiary	126 (49.8)	127 (50.2)		
Marital Status				
Married	146 (51.0)	140 (49.0)	3.786	0.052
Not married	4 (100.0)	0 (0.0)		
Tribe				
Yoruba	130 (51.2)	124 (48.8)	1.132	0.067
Igbo	10 (50.0)	10 (50.0)		
Hausa	2 (50.0)	2 (50.0)		
Edo	8 (66.7)	4 (33.3)		
Parity				
1	39 (26.0)	27 (19.3)	11.800	0.296
2-4	109 (72.7)	108 (77.1)		
≥5	2 (1.3)	5 (3.6)		
Place of Antenatal Care				
Non-formal				
Mission Home	4 (66.7)	2 (33.3)	3.395	0.335
Traditional Birth Attendant	2 (100.0)	0 (0.0)		
Formal				
General Hospital	88 (48.9)	92 (51.1)		
Tertiary Hospital	56 (54.9)	46 (45.1)		
Mode of delivery				
Vaginal Delivery	120 (76.9)	36 (23.1)	85.854	<0.001
Elective Caesarean Section	10 (18.2)	45 (81.8)		
Emergency Caesarean Section	20 (25.3)	59 (74.7)		

Educational attainment is an important determinant of maternal health. Higher levels of education have been associated with improved family planning and other reproductive health services uptake. Tarekegn et al in the review of 2011 Ethiopian demographic and health survey on determinants of utilization of maternal health services find that education of women, among

others, were significantly associated with the use of maternal health services.¹⁶

Majority of the women who participated in this study were between the ages of 26-35 years with a mean age of 31.88±5.1 years. These represent the active reproductive years that need counselling against this hazardous practice to prevent its continuation. These young mothers, especially when they are

primigravidae, tend to have less freedom of expression of issues surrounding pregnancy and postpartum care in the presence of considered more experience mother-in-laws and mothers who are, usually, less enthusiastic about subsequent deliveries. In a study of delivery and postpartum practices among new mothers in Laputta, Myanmar, the investigators find that the despite adequate knowledge of modern postpartum practices by these new mothers mothers-in-laws' beliefs in traditional practices were particularly strong and influenced the young mothers postpartum practices.¹⁷ Also, the eagerness of this category of parturient women with less motherhood experiences to quickly return to their non-parous practices like resumption of sexual intercourse may make them readily accept HAC.

Iliyasu and his co-investigators find that early resumption of sexual activities was commoner among the younger and less parous women in their study of correlates of postpartum sexual activity and contraceptive use in Kano, Northern Nigeria.¹⁸ All these were demonstrated in this study, albeit not to statistically significant level. More of the women with lower parities practiced HAC comparatively with the grand-multiparous women with either encouragement and/or assistance from their mothers or mothers-in-law. Also, the role of repeated counseling from antenatal visits from subsequent pregnancies might contribute to the observed less practice of HAC by multiparous women. Quality antenatal care (ANC) provides one of the most effective ways of educating mothers on the preventive, promotive and curative cares relating to pregnancy, labour and puerperium. Its under-usage as well as its poor qualities have been associated with several practices that have no scientific bases and, as such, associated with adverse maternal outcomes.¹⁹

More of the respondents, though not statistically significant ($p=0.335$), who had ANC in informal settings like traditional birth attendant and mission homes practiced HAC compared with those who had antenatal care in formal settings. This finding emphasized the negative roles competing traditional believes and practices are having on the important roles of antenatal care in promoting the right prenatal and postnatal practices in our settings.²⁰ In a study to understand the barriers to antenatal care utilization in a district in Malawi, cultural beliefs were mentioned as some of the important factors.²¹ It is, therefore, imperative that there is need to address these deeply rooted culture and traditions as we strive to upgrade infrastructure and strengthen the competencies of health personnel to achieve improved maternity outcomes. Vaginal delivery was significantly associated with the practice of HAC than caesarean delivery ($p<0.001$). This can be explained by postpartum recovery after vaginal delivery being, usually, faster than for caesarean delivery with associated earlier discharge from the hospital. Vaginal delivery was an important predictor of early and quality discharge after birth in an adaptation to transitions conceptual framework guided descriptive correlational study of 185 English- and Spanish-speaking postpartum mothers by Malagon-Maldonado and colleagues in United State of America.²² Also, there is a tendency to practice abdominal care, including HAC, because there is less fear of interference arising from perceived safety of the procedure.²³

The respondents practiced HAC for varied reasons which include personal reasons like the belief that it helps with uterine involutions and flattening of the abdomen, help with lochia flow and provides some pain relief. These reasons are similar to those given for such postpartum practices in other studies.^{6, 17,}

²⁴ The influential roles of the mothers and mothers-in-law in maintaining some of these practices that have no scientific basis were obvious from this study. Their encouragement and assistance in the practice of HAC were clearly shown in this study. In about one-quarter of our respondents, their mother was responsible for encouraging them to practice HAC and more than three-quarters of the mothers and mothers-in-law assisted with the practice of HAC. These culturally embedded attitudes and beliefs, passed down by these mothers and grandmothers who are considered more experienced, affect people's lifestyle and health practices like the practice of HAC.

It is important for husbands, parents, in-laws, health care workers, policy makers and all stakeholders responsible for obstetric services to gain an understanding of these potentially harmful customs and cultural beliefs so that health education programmes that dissuade women from resorting to these practices can be incorporated in maternal and child health care services.²⁵ These influential roles of mothers and mothers-in-laws on postpartum practices of parturient were further confirmed in that majority of the parturient that practiced HAC were assisted by their mothers or mother-in-law and 12.8% practiced HAC as a family tradition. The level of education, the occupation of the mothers and mothers-in-law, though not specifically evaluated in this study, may play significant role on their availability and attitude towards the practice of HAC. Maternal mortality is a global public health problem and reflects issues of inequality and injustice. Some of its causes resulting from patients' cultural health beliefs and practices are preventable.²⁶ These usually conflict with evidence-supported biomedical healthcare values and practices. The public health implications of these is persistence of high burden of maternal morbidities and

mortalities and failure to achieve the targets of Sustainable Development Goal 3 as anticipated by the year 2030.

Though this study has shown that practice of postpartum hot abdominal compression is high, it is not without some limitations especially being a single institution experience. While this practice with no scientific basis and clinical benefit is still going on in our environment, the reasons as shown in this study and other similar studies need further evaluation especially using qualitative studies and involving identified stakeholders in its practice like the mothers and mothers-in-law of the respondents because of the identified deep cultural association. Also, there is need to involve participants across the secondary and primary public health facilities and, possibly, private health facilities to better understand this culturally deep-rooted practice at all levels of health care services. This will also allow the understanding of the interplay of rural and urban geographical, socio-cultural and infrastructural differences in the practice of HAC and other postpartum practices.

Acknowledgment: The authors wish to acknowledge the participants for their willingness to be part of this study. The cooperation of the nursing and other support staff of the postnatal clinic of Obstetrics and Gynaecology Department, University College Hospital, Ibadan, Nigeria is deeply appreciated.

Conflict of Interest: None for declaration by any of the authors

REFERENCES

1. Okendo C, Ezem BU, Ojiyi EE. Still birth rate in a teaching hospital in South-Eastern Nigeria: A silent Tragedy. *Ann Med Health Sci. Res.* 2012; 2: 176-179

2. Edmonds DK. Puerperium and Lactation. In: Edmonds DK, Christoph Lees and Tom Bourne editor. Dewhurst's textbook of Obstetrics and Gynaecology 9th ed. Wiley BlackWell; 2018. 433-444.
3. Acharya J, Kaehler N, Marahatta SB, Mishra SR, Subedi S, Adhikari B. Hidden costs of hospital-based delivery from two tertiary hospitals in Western Nepal. PLoS One. 2016; 11(6): e0157746.
4. Kaelin AA, Honart A, Monteagudo A, McClelland S, Basher B, Timor-Tritsch IE. Cesarean delivery changes the natural position of the uterus on transvaginal ultrasonography. Journal of Ultrasound in Medicine. 2018; 37(5): 1179-1183.
5. Paliulyte V, Drasutiene GS, Ramasauskaite D, Bartkeviciene D, Zakareviciene J, Kurmanavicius J. Physiological uterine involution in primiparous and multiparous women: Ultrasound Study. Obstet Gynaecol Int. 2017; 6739345. doi: 10.1155/2017/6739345.
6. Okeke TC, Ugwu EO, Ezenyeaku CCT, Ikeako LC, Okezie OA. Postpartum practices of parturient women in Enugu, South East Nigeria. Annals of Medical and Health Sciences Research. 2013; 3(1): 47-50.
7. Yugbaré Belemsaga D, Goujon A, Bado A, Kouanda S, Duysburgh E, Temmerman M, Degomme O. Integration of postpartum care into child health and immunization services in Burkina Faso: Findings from a cross-sectional study. Reprod Health. 2018 Oct 11; 15(1): 171. doi: 10.1186/s12978-018-0602-8.
8. Boonruab J, Nimpitakpong N, Damjuti W. The distinction of Hot Herbal Compress, Hot Compress, and Topical Diclofenac as Myofascial Pain Syndrome Treatment. J Evid Based Integr Med. 2018; 23: 2156587217753451.
9. Ran QZ, Shi AL. Study on SHI's Bian stone comprehensive therapy for rehabilitation after induced abortion. Zhongguo Zhen Jiu. 2009; 29(2): 103-105.
10. Ngunyulu, RN, Mulaudzi, FM. Indigenous practices regarding postnatal care at Sikhunyani Village in the Limpopo Province of South Africa. Africa Journal of Nursing and Midwife. 2009; 11(1): 48-64
11. Medical Dictionary for the Health Professions and Nursing. (2012). Accessed June 5 2018 from <https://medical-dictionary.thefreedictionary.com/hot+compress>.
12. Ali AA, Rayis DA, Mamoun M, Adam I. Use of family planning methods in Kassala, Eastern Sudan. BMC Res Notes. 2011; 4(1): 43
13. Ali AA, Adam I. Lack of antenatal care, education and high maternal mortality in Kassala hospital, eastern Sudan during 2005-2009. J Matern Fetal Neonatal Med. 2011 Aug; 24(8): 1077-1078
14. World Health Organization. Essential Antenatal, Perinatal and Postpartum Care Training Modules, 2003. WHO Regional Office for Europe, Copenhagen, Denmark.
15. Altuntuğ K, Anık Y, Ege E. Traditional practices of mothers in the postpartum period: Evidence from Turkey. Afr J Reprod Health. 2018 Mar; 22(1): 94-102. doi: 10.29063/ajrh2018/v22i1.9.
16. Tarekegn SM, Lieberman LS, Giedraitis V. Determinants of maternal health service utilization in Ethiopia: analysis of the 2011 Ethiopian Demographic and Health Survey. BMC Pregnancy Childbirth. 2014; 7(14): 161.
17. Diamond-Smith N, Thet MM, Khaing EE, Sudhinaraset M. Delivery and postpartum practices among new

- mothers in Laputta, Myanmar: intersecting traditional and modern practices and beliefs. *Cult Health Sex.* 2016 Sep; 18(9): 1054-1066.
18. Iliyasu Z, Galadanci HS, Danlami KM, Salihu HM, Aliyu MH. Correlates of postpartum sexual activity and contraceptive use in Kano, Northern Nigeria. *Afr J Reprod Health.* 2018 Mar; 22(1): 103-112. doi: 10.29063/ajrh2018/v22i1.10.
 19. Larsen A, Exavery A, Phillips JF, Tani K, Kanté AM. Predictors of health care seeking behavior during pregnancy, delivery and the postnatal period in rural Tanzania. *Matern Child Health J.* 2016; 20(8): 1726-1734.
 20. Shah R, Rehfuess EA, Paudel D, Maskey MK, Delius M. Barriers and facilitators to institutional delivery in rural areas of Chitwan district, Nepal: a qualitative study. *Reprod Health.* 2018 Jun 20; 15(1): 110. doi: 10.1186/s12978-018-0553-0.
 21. Chimatiro CS, Hajison P, Chipeta E, Muula AS. Understanding barriers preventing pregnant women from starting antenatal clinic in the first trimester of pregnancy in Ntcheu District-Malawi. *Reprod Health.* 2018 Sep 21; 15(1): 158. doi: 10.1186/s12978-018-0605-5.
 22. Malagon-Maldonado G, Connelly CD, Bush RA. Predictors of readiness for hospital discharge after birth: Building evidence for practice. *Worldviews Evid Based Nurs.* 2017 Apr; 14(2): 118-127. doi: 10.1111/wvn.12208.
 23. Deussen AR, Ashwood P, Martis R. Analgesia for relief of pain due to uterine cramping/involution after birth. *Cochrane Database of Systematic Reviews* 2011; Issue 5. Art. No.: CD004908. DOI: 10.1002/14651858.CD004908.pub2.)
 24. Udigwe GO, Emelumadu OF, Udigwe IB. Postpartum practices among the Igbos in Nnewi Southeast, Nigeria. *West Afr J Med.* 2013 Oct-Dec; 32(4): 272-276
 25. Withers M, Kharazmi N, Lim E. Traditional beliefs and practices in pregnancy, childbirth and postpartum: A review of the evidence from Asian countries. *Midwifery.* 2018 Jan; 56: 158-170. doi: 10.1016/j.midw.2017.10.019.
 26. Callister LC, Khalaf I. Culturally diverse women giving birth: their stories. *Childbirth across cultures: Springer;* 2009. p. 33-39.