# ETHIOPIAN JOURNAL OF REPRODUCTIVE HEALTH

EJRH

Visit us at www.ejrh.org

April, 2021 Volume 13, No. 2



A SYSTEMATIC REVIEW AND META-ANALYSIS ON WOMEN'S KNOWLEDGE OF PRECONCEPTION CARE

PAGE 1

THIRD STAGE OF LABOR PRACTICE AND ASSOCIATED FACTORS AMONG SKILLED BIRTH ATTENDANTS WORKING IN GAMO AND GOFA ZONE PUBLIC HEALTH FACILITY, SOUTHERN, ETHIOPIA

PAGE 9

IDEAL AGE AT FIRST MARRIAGE IS STILL BELOW THE LEGAL AGE OF MARRIAGE: THE CASE OF ADOLESCENT GIRLS ON WEST HARARGE ZONE, EASTERN ETHIOPIA A MIXED METHOD STUDY

PAGE 19

IMPACT OF UTILIZING THE WHO SAFE CHILDBIRTH CHECKLIST ON REDUCING MATERNAL AND PERINATAL DEATH: A SYSTEMATIC REVIEW AND META-ANALYSIS

PAGE 27

PREMISES AND RATIONALE OF CONTRACEPTIVE SERVICES ACCESSING IN SOUTHERN ETHIOPIA: A PHENOMENOLOGICAL EXPLORATION

PAGE 38

STILLBIRTH AND ASSOCIATED FACTORS AMONG WOMEN DELIVERED IN PUBLIC HOSPITALS, SOUTHWEST ETHIOPIA

PAGE 46

DICEPHALUS PARAPAGUS TRIBRACHIUS DIPUS CONJOINED TWINS: A CASE REPORT

PAGE 55



www.esog-eth.org

# Ethiopian Journal of Reproductive Health (EJRH)

April, 2021



www.esog-eth.org

www.ejrh.org

Ethiopian Society of Obstetricians and Gynecologists (ESOG)

Tel.: +251 115 506 068/069, Fax: +251 115 506 070
P.O. Box: 8731
Addis Ababa, Ethiopia
esogeth@gmail.com
newsletter@esog.org.et
www.esog-eth.org

Address:
Head Office:
Ras Desta Damtew Avenue
Tsehafi Tizaz Teferawork Keda Building (Near Ghion Hotel)
East Wing, 2nd Floor, Room no 7
ESOG Project Office:
Kirkos District/ Kazanchis
Nigist Towers, 3rd floor

# Ethiopian Journal of Reproductive Health (EJRH)

April, 2021

## Table of Contents PAGE

A Systematic Review and Meta-analysis on Women's Knowledge of Preconception Care ..... 1

Third Stage of Labor Practice and Associated Factors Among Skilled Birth Attendants Working in Gamo and Gofa Zone Public Health Facility, Southern, Ethiopia ..... 9

Ideal Age at First Marriage is Still Below The Legal Age of Marriage: The Case of Adolescent Girls on West Hararge Zone, Eastern Ethiopia a Mixed Method Study ..... 19

Impact of Utilizing The Who Safe Childbirth Checklist on Reducing Maternal and Perinatal Death: A Systematic Review and Meta-Analysis ..... 27

Premises and Rationale of Contraceptive Services Accessing in Southern Ethiopia: A Phenomenological Exploration ..... 38

Stillbirth and Associated Factors Among Women Delivered in Public Hospitals, Southwest Ethiopia ..... 46

Dicephalus Parapagus Tribrachius Dipus Conjoined Twins: A Case Report ..... 55

# A SYSTEMATIC REVIEW AND META-ANALYSIS ON WOMEN'S KNOWLEDGE OF PRECONCEPTION CARE

Zemenu Yohannes Kassa, MSc[1], Nebiha Hadra, MSc[1]

## ABSTRACT

**BACKGROUND:** Preconception care includes any intervention to optimise a woman's health before pregnancy to improve maternal, newborn, and child health outcomes. It is vital for identifying risky behaviours before pregnancy and reducing the number of unintended pregnancies. This meta-analysis aimed to determine the pooled prevalence of women's knowledge across the world.

**METHOD:** Published and unpublished research reports on women's knowledge of preconception care were used. The databases used are PubMed, Medline, and Google Scholar. Unpublished articles were searched from different repository electronic libraries and through Google. Two independent authors (ZY and NH) searched articles by using the following key terms, "knowledge" OR "awareness", "woman/women*" AND "preconception care", "preconception care" OR "preconception health care", "preconception care" AND "worldwide". The critical appraisal was done using the Joana Brigg's Institute (JBI) checklist for prevalence study, which has nine scores.

**RESULTS:** Four hundred twenty-eight published and unpublished articles were retrieved from different databases: PubMed, Medline, Google Scholar, Google, and Cochrane Library. Unpublished articles were searched from different repositories, electronic libraries, and Google. The pooled prevalence of women's preconception care knowledge was 35.3% (95% CI: 24.5-47.8%).

**CONCLUSION:** This study showed that women's knowledge of preconception care is low. This finding suggests that governmental and non-governmental organisations should pay attention to creating awareness and implementation to enhance preconception care.

**KEY WORDS:** Women's knowledge, Preconception care, Meta-analysis, World

(The Ethiopian Journal of Reproductive Health; 2021; 13;1-8)

1 Department of Midwifery, College of Medicine and Health Sciences, Hawassa University, Hawassa

## INTRODUCTION

Preconception health care improves maternal and unborn child outcomes by recognising and identifying risky behaviours before pregnancy and reducing the number of unintended pregnancies 1. It is crucial to prevent maternal and child morbidity and mortality, which is mainstreamed in the routine health care system [2]. Preconception care (PCC) is defined as the provision of biomedical, behavioural, and social health interventions to women and couples before conception. It aims to improve their health status and reduce behaviours and individual and environmental factors that contribute to depriving maternal and child health outcomes [3].

Despite the international community's priority agenda on maternal and child health care, maternal and neonatal mortality reduction is not at the expected level [4]. Preconception care plays a crucial role in maternal and neonatal morbidity and deaths. It is evidence-based health promotion, disease prevention, and treating existing disease before pregnancy to prevent adverse pregnancy outcomes. However, it is not routinely practised within the continuum of maternal and child health care in low and middle-income countries. Maternal and child health experts recommend that preconception health care is a crucial intervention to modify biomedical, behavioural, and social risks for better pregnancy and childbirth outcomes through risk assessment, health promotion, disease prevention, and care provision [5,7].

Preconception of health care is an old idea, but little attention has given to maternal stakeholders and experts [8, 9]. At the same time, developing countries are not integrated with the continuum of care on maternal and child health care. It provides a window of opportunity to eliminate risks by focusing on the period before conception [10, 11].

Currently, care is focused on antenatal care, institutional delivery, postnatal care, and child health to reduce maternal and neonatal morbidity and mortality 12. However, as one of the key elements to tackle maternal and neonatal morbidity and mortality, preconception care is missing in the package [12]. Every day, 7000 neonates died globally in 2018, and 2.5 million neonates died in the first month of life. Neonatal mortality was estimated at 18 deaths per 1000 live births worldwide [13].

Worldwide every year, 295 000 newborns die within 28 days of birth due to congenital anomalies [14]. Besides, couples' knowledge of preconception care is crucial to improving maternal and child health [15, 16]. Preconception healthcare guidelines have developed and integrated as a continuum of care in high and middle high countries, while most low-income countries have not yet set guideline [17].

Knowledge of preconception care can be acquired through experience or education. Education can be attained from multiple sources (e.g., books, newspapers, radio channels, television, the internet or medical staff consultations, friends, and families). Studies have revealed that women who receive prepregnancy care have more knowledge and often show more significant risk reduction behaviours [18]. There is disperse studies that did not show the pooled prevalence of women's knowledge of preconceptions. Therefore, this systematic review and meta-analysis of women's preconception care knowledge are crucial to fill the gap. This study is used as an input for policymakers, relevant stakeholders, and clinicians to reduce the global maternal mortality ratio to less than 70 per 100,000 live births, to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.

## METHODS

Published and unpublished research reports on women's knowledge of preconception care were used. The databases used are PubMed, Medline, and Google Scholar. Unpublished articles were searched from different repositories from electronic libraries and Google. Searching for the articles was conducted from September 10 to December 12, 2018. Two independent authors (ZY and NH) searched articles by using the following key terms, "knowledge" OR "awareness", "woman/women

AND "preconception care", "preconception care" OR "preconception health care", "preconception care" AND "worldwide"

**Inclusion**

In this study, journal articles, masters' theses, and dissertations are included. Study settings included are community-based or institutional-based crosssectional studies which report the level of women's knowledge of preconception care.

**Exclusion**

Conference abstracts, proceeding abstracts, articles with incomplete information, have methodological problems, full text not available, systematic review, and meta-analysis and articles not publish in the English language are excluded. All records were managed in Endnote version X7 to remove duplicated studies.

**Data screening and extraction**

Data screening and extraction were done by two independent authors (ZY and NH) using Preferred Reporting Items for Systematic reviews and MetaAnalyses (PRISMA) guidelines [19].

The critical appraisal was done using the Joana Brigg's Institute (JBI) checklist for prevalence study by two independent assessors (ZY and NH) [20] using nine checklist items. Nine checklist items are the sample frame appropriate to address the target population; study participants sampled appropriately, the sample size adequate, the study subjects and the setting described in detail, the data analysis conducted with sufficient coverage of the identified sample, valid methods used for the identification of the condition, the condition measured in a standard, reliable way for all participants, appropriate statistical analysis and the response rate adequate, and if not, was the low response rate managed appropriately. Scoring problems during the critical appraisal were solved through discussion and consensus reviewing the articles together. During the critical appraisal articles score, ≥five are included in this systematic review and meta-analysis.

**Statistical analysis**

Data entry was done using Microsoft Excel and exported to a comprehensive meta-analysis (version 3.1) for analysis. The pooled prevalence of women's knowledge on preconception care with 95% CI was done using the random effect model, due to the possibility of heterogeneity among the studies.

**Heterogeneity and publication bias**

Heterogeneity was assessed using I2 and Cochran's Q test (P-value >0.10). I2 test statistics results of 25%, 50%, and 75% were declared as low, moderate, and high heterogeneity respectively [21]. The publication bias was assessed using Egger's test objectively and funnel plot subjectively. Any asymmetry of a funnel plot and statistically significant p-value less than 0.05 was suggestive of publication bias [22].

## RESULTS

Four hundred twenty-eight published and unpublished articles were retrieved from different databases: PubMed, Medline, and Google Scholar. Unpublished articles searched from different repositories from electronic libraries and Google. Articles were screened and extracted using the PRISMA guideline. Three hundred eighty articles were excluded due to duplication, 48 articles were reviewing full articles, and 34 articles were excluded after full article review due to unreported prevalence. Finally, 14 studies were included in the meta-analysis (Figure 1). The heterogeneity test revealed that I2=98.53 %, the p-value is 0.000, and publication bias (Egger's test p-value is 0.18).

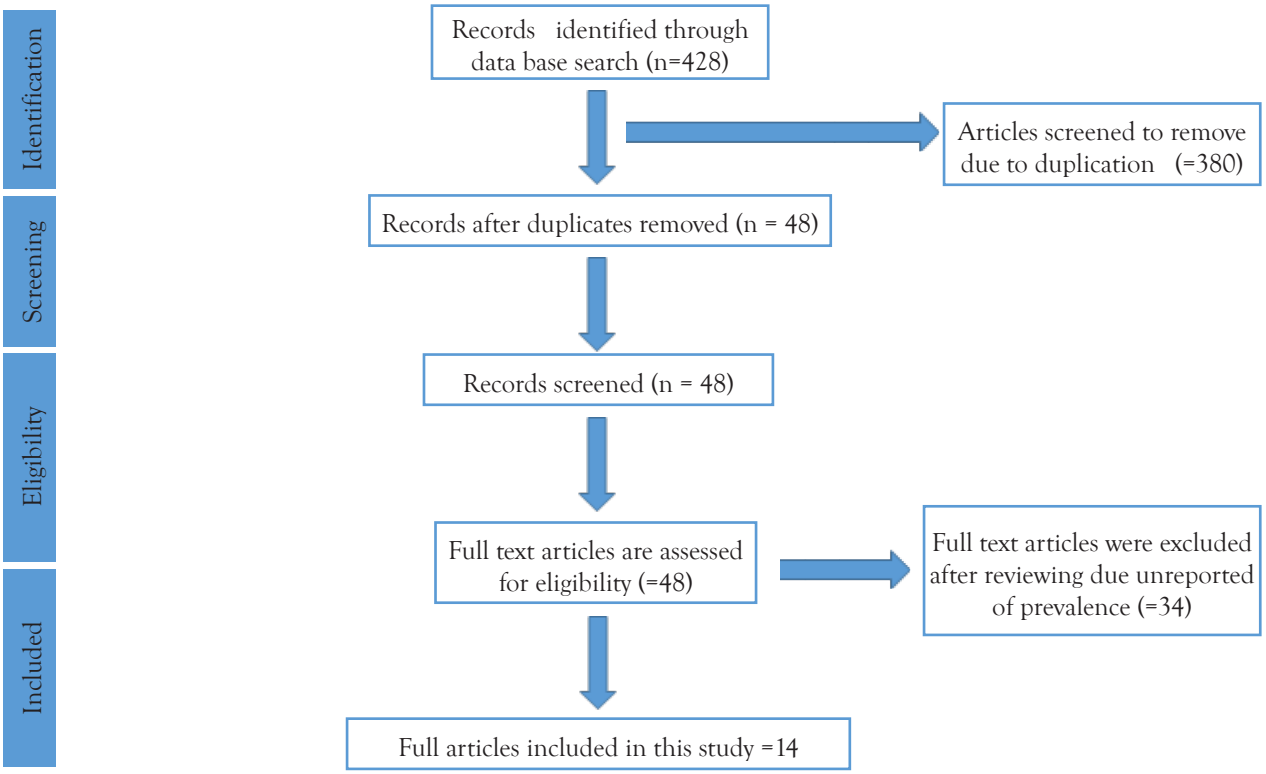


**Figure 1: PRISMA Flow diagram**

## Study characteristics

The total study population that participated in this systematic review and meta-analysis was 5,208. Four hundred twenty-two participated in community based studies, 3802 have participated in hospitals based studies, and 984 were health institutionbased studies. The sample size varied from 100 to 660 (table 1) [23-36].

**Table 1: women's knowledge on preconception care (23-36)**

| Author | Year of publication | Country | Study design | Study population | Sample size | No.know-ledgeable | Response rate | Prev.(%) |
|---|---|---|---|---|---|---|---|---|
| Ayalew et al.(23) | 2017 | Ethiopia | CS | Community | 422 | 116 | 100 | 27.5 |
| Kassa and Yohannes (24) | 2018 | Ethiopia | CS | Hospital | 580 | 116 | 100 | 20 |
| Andualem et al.,(25) | 2016 UP | Ethiopia | CS | health | 634 | 402 | 100 | 63.4 |
| Zemenu et al.,(26) | 2017 UP | Ethiopia | CS | Hospital | 270 | 143 | 99 | 53 |
| Ahmed K et al(27) | 2015 | Sudan | CS | Hospital | 100 | 11 | | 11 |
| P. Paudel et al.(28) | 2012 | Nepal | CS | Hospital | 400 | 65 | 100 | 16.3 |
| Prashansa Gautam et al.;(29) | 2016 | Nepal | CS | Hospital | 227 | 35 | 100 | 84.58 |
| Moura et al(30) | 2012 | Brazil | CS | Hospital | 106 | 44 | 100 | 41.5 |
| Coonrod (31) | 2009 | USA | CS | Hospital | 305 | 232 | 100 | 76 |
| Gjergja et al.(32) | 2006 | Croatia | CS | Hospital | 569 | 408 | | 71.7 |
| N. N. EKEM et al(33) | 2018 | Nigeria | CS | Hospital | 450 | 143 | 99.3 | 31.7 |
| Al-Darzi et al(34) | 2014 | Egypt | CS | Hospital | 660 | 259 | 98.2 | 39.2 |
| Kasim et al(35) | 2016 | Malaysia | | Hospital | 135 | 70 | 100 | 51.9 |
| Ghaffari et al.(36) | 2014 | Iran | CS | health | 350 | 36 | | 10.4 |

**Meta-analysis**

The pooled prevalence of women's preconception care knowledge was 35.3% (95% CI: 24.5-47.8%). The Cochran's Q and I2 statistics for women's knowledge of preconception care were 884.61 and 98.53% (fig .2).

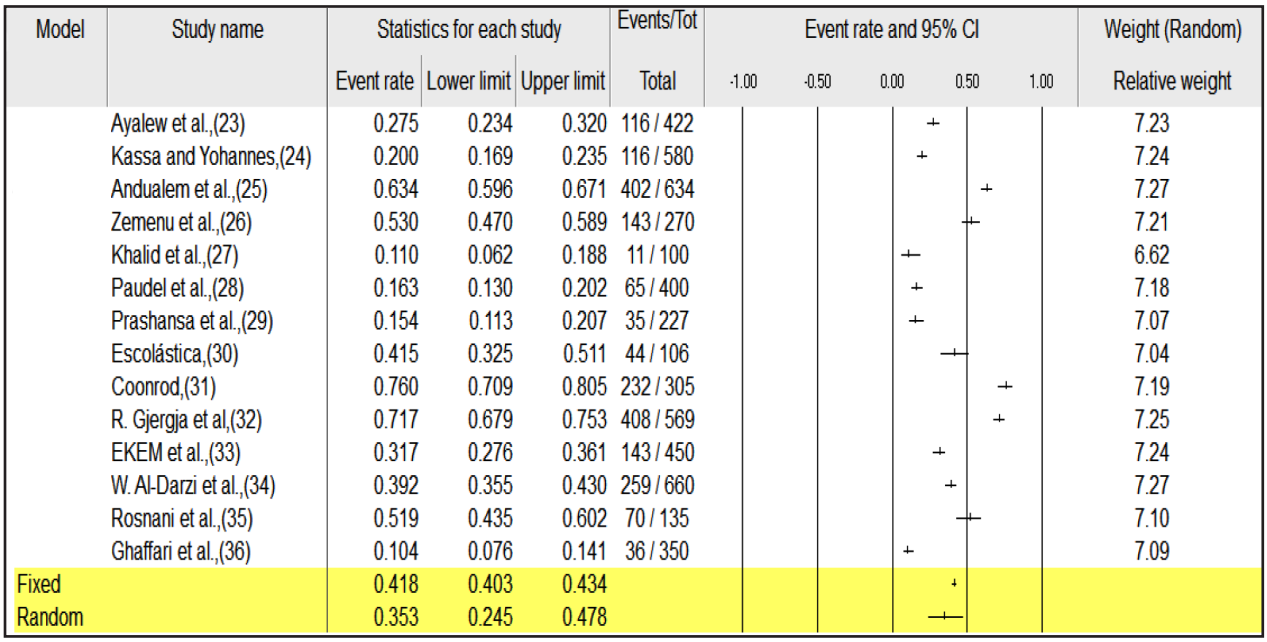


**Figure 2: Women's level of knowledge on preconception care**

## DISCUSSION

Preconception care implementation and provision is a window of opportunity to alter or eliminate risky behaviours by focusing on the period before conception. It is a cheap, simple strategy that can significantly decrease adverse pregnancy outcomes [10, 11, 37]. The purpose of this meta-analysis was to assess women's knowledge of preconception care. Fourteen studies were included in this metaanalysis. The pooled estimated prevalence of women's level of knowledge on preconception care was 35.3%. This finding showed that women's level of knowledge of preconception care is low compared to the idea of preconception care launched in 1960, whereas preconception care has not given attention until 2005 [8]. Women's knowledge of preconception care is quite different from country to country; some countries have preconception care guidelines and routinely practice preconception care while others do not have a guideline. Women's level of knowledge on preconception care is vital for the alleviation of adverse pregnancy outcomes and to decrease maternal and child morbidity and mortality [38, 39]. Women who have adequate knowledge of preconception care can check their health status before conception to cease risky behaviours'. A meta-analysis showed that preconception care is effective to reduce congenital malformation [40]. The implication of this study is to synthesise information on women's level of knowledge on preconce ption care.

This meta-analysis is an input for relevant stakeholders and policymakers to achieve sustainable development goal 3.1 to reduce maternal mortality

ratio to less than 70 per 100,000 live birth by 2030 and 3.2 to reduce neonatal mortality to at least as low as 12per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births by 2030.

## CONCLUSION AND RECOMMENDATION

This study revealed that women's knowledge of preconception care is low. This finding suggests that governmental and non-governmental organisations should give attention to the creation of awareness and implementation to enhance preconception care.

## LIMITATION

The potential limitation of this study is method difference to measure knowledge on preconception care within the studies and the use of various scales. This can affect the level of knowledge of preconception care. Another limitation is the way of defining women's knowledge of preconception care differently and the use of different variables. An important limitation is most of the studies were institutional based, which misses the community-based study.

## ACKNOWLEDGMENTS

I would like to acknowledge the study participants and the researchers . .

## AUTHORS' CONTRIBUTIONS

ZY generated the idea and design for the study, collected, entered, analysed, interpreted the data, and prepared the manuscript. NH contributed to data analysis, interpretation and drafted the manuscript. All authors read and approved the final manuscript.

## DISCLOSURE STATEMENT

The authors declare there are no competing interests.

## ETHICS AND CONSENT

Not applicable

## ACKNOWLEDGMENT

Not applicable

## FUNDING INFORMATION

Not applicable

## PAPER CONTEXT

We carried out a systematic review and meta-analysis of women's level of knowledge on preconception care in the world to synthesis pooled level of knowledge on preconception care by women. Women's level of knowledge on preconception is 35.3%. Meanwhile, maternal health and child health priority agendas are still a significant number of maternal and neonatal morbidity and mortality. This evidence recommended that stakeholders create awareness on preconception care and implement preconception care strategy to improve women's knowledge of preconception care..

## CORRESPONDING AUTHOR

**Zemenu Yohannes Kassa, MSc**

Department of midwifery, college of medicine and health sciences, Hawassa University, Hawassa
Email: zemenu2013@gmail.com

## REFERENCES

1. Simone J, Hoyt MJ, Storm DS, Finocchario-Kessler S. Models of HIV Preconception Care and Key Elements Influencing These Services: Findings from Healthcare Providers in Seven US Cities. AIDS patient care and STDs. 2018.
2. Olayinka OA, Achi OT, Amos AO, Chiedu EM. Awareness and barriers to utilisation of maternal health care services among reproductive women in Amassoma community, Bayelsa State. International Journal of Nursing and Midwifery. 2014;6(1):10-5.
3. Nitert MD, Barrett H, de Jersey S, Matusiak K, McIntyre H, Callaway L. Preconception care and barriers to addressing overweight and obesity: a focus on weight loss advice and weight loss strategies. Handbook of diet and nutrition in the menstrual cycle, periconception and fertility: Wageningen Academic Publishers; 2014. p. 2772-82.
4. Kassa A, Human SP, Gemeda H. Knowledge of preconception care among healthcare providers working in public health institutions in Hawassa, Ethiopia. PloS one. 2018;13(10):e0204415.
5. Moos M-K. From concept to practice: reflections on the preconception health agenda. Journal of Women's Health. 2010;19(3):561-7.
6. Curtis MG. Preconception care: clinical and policy implications of the preconception agenda. JCOM. 2010;17(4):30-8.
7. Organisation WH. Preconception care: maximising the gains for maternal and child health. Geneva: World Health Organization. 2013.
8. Johnson K, Posner SF, Biermann J, Cordero JF, Atrash HK, Parker CS, et al. Recommendations to Improve Preconception Health and Health Care—United States: Report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. Morbidity and Mortality Weekly Report: Recommendations and Reports. 2006;55(6):1-CE-4.
9. Harelick L, Viola D, Tahara D. Preconception health of low socioeconomic status women: assessing knowledge and behaviors. Women's Health Issues. 2011;21(4):272-6.
10. Lu MC. Recommendations for preconception care. American Family Physician. 2007;76(3).
11. Poels M, van Stel HF, Franx A, Koster MP. Actively preparing for pregnancy is associated with healthier lifestyle of women during the preconception period. Midwifery. 2017;50:228-34.
12. Mitchell EW, Levis DM, Prue CE. Preconception health: awareness, planning, and communication among a sample of US men and women. Maternal and Child Health Journal. 2012;16(1):31-9.
13. Hug L, Alexander M, You D, Alkema L, for Child UI-aG. National, regional, and global levels and trends in neonatal mortality between 1990 and 2017, with scenario-based projections to 2030: a systematic analysis. The Lancet Global Health. 2019;7(6):e710-e20.
14. World Health Organization WHO. Congenital anomalies. Factsheet N 370. December 2020.
15. Dai L, Zhu J, Liang J, Wang Y-P, Wang H, Mao M. Birth defects surveillance in China. World Journal of Pediatrics. 2011;7(4):302.
16. Baykan Z, Öztürk A, Poyrazo□lu S, Gün □. Awareness, knowledge, and use of folic acid among women: a study from Turkey. Archives of gynecology and obstetrics. 2011;283(6):1249-53.
17. Poels M, van Stel HF, Franx A, Koster MP. The effect of a local promotional campaign on preconceptional lifestyle changes and the use of preconception care. The European Journal of Contraception & Reproductive Health Care. 2018;23(1):38-44..
18. Elsinga J, de Jong-Potjer LC, van der Pal-de KM, le Cessie S, Assendelft WJ, Buitendijk SE. The effect of preconception counselling on lifestyle and other behaviour before and during pregnancy. Women's Health Issues. 2008;18(6):S117-S25..
19. JBI. critical appraisal checklist for studies reporting prevalence data 2016..
20. Hutton B, Salanti G, Caldwell DM, Chaimani A, Schmid CH, Cameron C, et al. The PRISMA extension statement for reporting of systematic reviews incorporating network meta-analyses of health care interventions: checklist and explanations. Annals of internal medicine. 2015;162(11):777-8.
21. Egger M, Smith GD, Schneider M, Minder C. Bias in meta-analysis detected by a simple, graphical test. Bmj. 1997;315(7109):629-34.
22. Huedo-Medina TB, Sánchez-Meca J, Marín-Martínez F, Botella J. Assessing heterogeneity in meta-analysis: Q statistic or $I^2$ index? Psychological methods. 2006;11(2):193.
23. Ayalew Y, Mulat A, Dile M, Simegn A. Women's knowledge and associated factors in preconception care in adet, west gojjam, northwest Ethiopia: a community based cross sectional study. Reproductive health. 2017;14(1):15.
24. Kassa A, Yohannes Z. Women's knowledge and associated factors on preconception care at Public Health Institution in Hawassa City, South Ethiopia. BMC research notes. 2018;11(1):841.
25. Andualem et al. Assessment knowledge and experience of preconception care among pregnant mothers attending antenatal care in West Shoa Zone public health centers. unpublished
26. Zemenu et al. Levels and correlates of knowledge and attitude on preconception care at public hospitals in Wolayita Zone, South Ethiopia unpublished

27. Ahmed K, Saeed A, Alawad A. Knowledge, Attitude and Practice of Preconception Care among Sudanese Women in Reproductive Age About Rheumatic heart disease. International Journal of Public Health. 2015;3(5):223-7.
28. Paudel P, Wing K, Silpakar S. Awareness of periconceptional folic acid supplementation among Nepalese women of childbearing age: a cross-sectional study. Preventive medicine. 2012;55(5):511-3.
29. Gautan P, Dhakal R. Knowledge on preconception care among reproductive age women. Saudi J Med Pharm Sci. 2016;2(1):6.
30. Moura ERF, Evangelista DR, Damasceno AKdC. The knowledge of women with diabetes mellitus regarding preconception care and maternal-fetal risks. Revista da Escola de Enfermagem da USP. 2012;46(1):22-9.
31. Coonrod DV, Bruce NC, Malcolm TD, Drachman D, Frey KA. Knowledge and attitudes regarding preconception care in a predominantly l ow-income Mexican American population. American journal of obstetrics and gynecology. 2009;200(6):686. e1-. e7.
32. Gjergja R, Stipoljev F, Hafner T, Tezak N, Luzar-Stiffler V. Knowledge and use of folic acid in Croatian pregnant women—a need for health care education initiative. Reproductive toxicology. 2006;21(1):16-20.
33. Ekem NN, Lawani LO, Onoh RC, Iyoke CA, Ajah LO, Onwe EO, et al. Utilisation of preconception care services and determinants of poor uptake among a cohort of women in Abakaliki Southeast Nigeria. Journal of Obstetrics and Gynaecology. 2018:1-6.
34. Al Darzi W, Al Mudares F, Farah A, Ali A, Marzouk D. Knowledge of periconceptional folic acid use among pregnant women at Ain Shams University Hospital, Cairo, Egypt. EMHJ-Eastern Mediterranean Health Journal. 2014;20(9):561-8.
35. Kasim R, Draman N, Kadir AA, Muhamad R. Knowledge, Attitudes and Practice of Preconception Care among Women Attending Maternal Health Clinic in Kelantan. Education in Medicine Journal. 2016;8(4).
36. Ghaffari F, Jahani Shourab N, Jafarnejad F, Esmaily H. Application of Donabedian quality-of-care framework to assess the outcomes of preconception care in urban health centers, Mashhad, Iran in 2012. Journal of Midwifery and Reproductive Health. 2014;2(1):50-9.
37. Auriel E, Biderman A, Belmaker I, Freud T, Peleg R. Knowledge, attitudes, and practice among women and doctors concerning the use of folic acid. ISRN obstetrics and gynecology. 2010;2011
38. Cawley S, Mullaney L, McKeating A, Farren M, McCartney D, Turner M. A review of European guidelines on periconceptional folic acid supplementation. European journal of clinical nutrition. 2016;70(2):143.
39. Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, et al. Stillbirths: rates, risk factors, and acceleration towards 2030. The Lancet. 2016;387(10018):587-603.
40. Wahabi HA, Alzeidan RA, Bawazeer GA, Alansari LA, Esmaeil SA. Preconception care for diabetic women for improving maternal and fetal outcomes: a systematic review and meta-analysis. BMC pregnancy and childbirth. 2010;10(1):63.

# THIRD STAGE OF LABOR PRACTICE AND ASSOCIATED FACTORS AMONG SKILLED BIRTH ATTENDANTS WORKING IN GAMO AND GOFA ZONE PUBLIC HEALTH FACILITY, SOUTHERN, ETHIOPIA

Biresaw Wassihun, MSc.[1], Agegnehu Bante, MSc.[1], Direslign Miskir, MPH[1], Teklemariam Gultie, MSc.[1], Meseret Girma, MPH[1], Kassahun Gebayehu, MSc.[2], Daniel Adane, MSc.[3]

## ABSTRACT

**BACKGROUND:** The third stage of labor is the most perilous for the woman because of the risk of postpartum hemorrhage (PPH). Proper management of the third stage of labor is an effective intervention to prevent maternal mortality.

**OBJECTIVE:** This study aimed to assess the status of active management of the third stage of labor practice and associated factors among obstetric care providers working in public health facilities of Gamo and Gofa zone, southern Ethiopia

**METHODS:** In this institution-based cross-sectional study, 356 health care providers who were working in public health facilities of the Gamo and Gofa zone were involved. Interviews were administered; a pre-tested and semi-structured questionnaire with an observational checklist was used to collect data. Epi Data version 3.2 was used to code and enter data, which were analyzed using SPSS version 24. Descriptive statistics were calculated for each variable, and binary logistic regression analysis with 95% confidence intervals (CIs) was carried out to determine the associations between predictor variables and outcome variables.

**RESULT:** The finding of the study revealed that 48.1% of health care providers have a good practice on active management of the third stage of labor. Clinical years of experience (AOR = 4.32; 95%CI: (2.78-9.10), having taking in-service basic emergency obstetric care (B-EmOC) training (AOR = 2.34; 95%CI: 1.87-4.46), and having a conducive delivery room (AOR=1.86 95% CI 1.32-2.24) were significantly associated with good practice active management of the third stage of labor.

**CONCLUSION:** The finding of this study showed that the practice of active management of the third stage of labor was low. Clinical years of experience, having a satisfactory delivery room, and taking in-service training were some of the factors associated with good practice toward active management of the third stage of labor. Providing competency-based the use of up-to-date clinical guidelines, and ensuring regular training will be needed to improve the practice of the third stage of labor.

**KEY WORDS:** Active management, Third stage of labor, Practice, Ethiopia

(The Ethiopian Journal of Reproductive Health; 2021; 13;9-18)

1 College of Medicine and Health Sciences, Arba Minch University, Arba Minch, Ethiopia

2 Lecturer, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia

3 Department of Midwifery, College of Medicine and Health Sciences, Wolkite University, Wolkite, Ethiopia

## INTRODUCTION

Postpartum hemorrhage (PPH) is the leading cause of maternal mortality, accounting for approximately 35% of all maternal deaths [1]. Currently, the World Health Organization recommends active management of the third stage of labor as a critical intervention for PPH prevention [2]. Active management of the third stage of labor (AMTSL) is a feasible and inexpensive intervention that can help to save thousands of women's lives [1]. It involves three interrelated but independent components: prophylactic administration of a uterotonic drug, controlled cord traction, and uterine massage [3].

Worldwide, the majority of direct maternal deaths are due to hemorrhage, typically in the postpartum period. Besides death, PPH also causes serious morbidities such as respiratory distress syndrome, coagulopathy, shock, loss of fertility, pituitary necrosis, and anemia in the mother.

[4-6]. In Africa, obstetrics hemorrhage is responsible for 34% of the total maternal deaths [7]. Sub-Saharan Africa alone accounts for nearly 66% of maternal death. The majority of these deaths occur within a few hours of delivery and in most cases are due to postpartum hemorrhage [7-8]

In Ethiopia, approximately 1.3 million women become pregnant every year, and unfortunately, a skilled provider assists only 26 % of births during delivery [9]. This has been a primary factor in the maternal mortality ratio (MMR) remaining high for the past decade. The current MMR for Ethiopia is 412/100,000 live births., Obstetric hemorrhage is one of the contributing factors of maternal mortality [9].

Literature showed that the majority of women who gave birth in a health facility particularly in most developing countries do not receive appropriate care during the third stage of labor [4]. Since all laboring women were at risk for PPH, health care providers need to possess the knowledge and skills to practice active management of the third stage of labor to prevent maternal mortality and morbidity [10].

Currently, in low resource countries like Ethiopia, active management of the third stage of labor is one of the most important tools to prevent post-partum hemorrhage. Therefore, this study aimed to assess the status of active management of the third stage of labor practice and associated factors among obstetric care providers working in public health facilities of Gamo and Gofa zone, southern Ethiopia

## METHODS

### Study setting and Study period

Gamo and Gofa are Zones within the South Nations, Nationalities, and Peoples' Region (SNNPR) of Ethiopia. The administrative center of Gamo is Arba Minch and the administrative center of Gofa Zone is Sawla. The study was conducted in selected public health facilities in Gamo and Gofa zone in south Ethiopia from September 15- May 30, 2018/2019

### Study design

A health facility-based cross-sectional study design.

### Study population

All obstetric caregivers who were working in a public health institution of Gamo and Gofa zone.

### Inclusion criteria

Those selected obstetric caregivers who were working in a public health institution of Gamo and Gofa Zone.

### Exclusion criteria

Those obstetric health care providers who were not present during the data collection period.

### Sample size determination

The sample size was calculated using a single population proportion formula by considering the following assumptions: 95% confidence level, the margin of error (0.05), P(Percentage of the appropriate practice of AMTSL) = 32.8% [13]. The required sample size after adding a 5% non-response rate was 356.

### Sampling Procedure

There are 81 public health facilitates which provide delivery service in the study area. 37 public health facilitates were selected randomly. The allocation of the sample to health facilities was made proportionally based on the number of health

care providers. Individual participants in each of the health facilities were selected by using simple random sampling until the required sample size at each health facility was obtained.

**Operational definitions**

**Active management of third stage labor (AMTSL):** is the administration of oxytocin within 1 minute of delivery of the baby, clamping and cutting of the cord within 2-3 minutes of delivery of baby, assisted delivery of the placenta through controlled cord traction, and massaging of the uterus immediately after delivery and subsequent massage every 15 minutes for the first 1-2 hours.

**Good practice:** A caregiver who performed at least all of the following during observation: Administered right dose of oxytocin within one minute of childbirth, delivered the placenta using controlled cord traction, massaged the uterus immediately, and massaged uterus every 15 minutes for the first 1-2 hours after the delivery was said to have a good practice on AMTSL; otherwise was considered poor practice.

**Data collection procedures**

The birth attendants were observed during the active third stage of labor and a self-administered questionnaire filled by the birth attendant. Obstetric care providers did not know the specific skill being observed. Finally, the observational checklist and the self-administered questionnaire of each study participant were combined according to the coded information on the questionnaires. In the data collection process, 6 data collectors (BSC midwives) supervised by 3 MSc Midwives were involved.

**Data quality control**

Both interview and observation were used on the same participant. All data collectors were working outside the study area. Before starting the actual data collection, one-day training was given for both data collectors and supervisors on objectives, approach to study subjects, and how to use the questionnaire. The pretest was conducted with 5% of the total sample size outside the study area 2 weeks before starting actual data collection. The reliability of the questionnaires was checked via SPSS by reliability index measurement for practice questions (Cronbach's alpha) which was 0.79. During data collection data collectors were first to observe at least three deliveries while care providers practice the third stage based on checklist and they would ask the same participants and supervision was done by field supervisors. Overall activities was controlled by the principal investigator.

**Data analysis and interpretation**

First, the collected data were checked manually for completeness. Then the data was cleaned and stored for consistency and entered into Epi Data version 3.1 software. For analysis, the data was exported to the statistical package for social sciences (SPSS) version 24.0 software. Descriptive statistics with percentages were employed. All variables were analyzed in bivariate logistic regression and those variables having P-value less than 0.25 were entered into multivariable logistic regression analyses. In multivariable logistic regression analyses variables with P-value, less than 0.05 were considered as significant. Hosmer–Lemeshow goodness of fit test was used to check the model fitness. Adjusted odds ratio with 95% confidence interval was used to determine the presence and direction of the association between covariates and the outcome variable

**Ethical Considerations**

Ethical clearance was obtained from the college of medicine and health science institutional review board of Arba Minch university. The College of Medicine and Health Sciences wrote an official letter of cooperation to the Gamo and Gofa Zone and Zonal health department, and administrators of each hospital and health center. Informed consent was obtained from each study participant and each study participant was informed about the objective of the study and confidentiality of the information she/he was giving. Moreover, the confidentiality of information was guaranteed by using code numbers rather than personal identifiers and by keeping the data locked.

## RESULT

Socio-demographic characteristic of Study Participants 345 obstetric care providers participated in the study, with a 97% response rate. The mean age of the respondents was 25.8 (standard division (SD)± 3.54) years. The majority of the respondents, 211 (61.1%) were females and the rest of 134 (38.8%) were male. The majority were midwives in profession 251(72.8%). Of these, 130 (37.7%) were diploma holder midwives Above half 179 (51.9%) were Orthodox Christians. (Table 1).

**Table 1. Socio-demographic characteristics of the obstetric care providers in Gamo and Gofa zone public health facility, Southern Ethiopia**

| Variables | Frequency | Percent (%) |
|---|---|---|
| **Age** | | |
| 20-25 | 190 | 55.1 |
| 26-30 | 114 | 33.0 |
| 31-35 | 34 | 9.9 |
| ≥36 | 7 | 2.0 |
| **Sex** | | |
| Male | 134 | 38.8 |
| Female | 211 | 61.1 |
| **Profession** | | |
| Midwife | 251 | 72.8 |
| Health officer | 57 | 16.7 |
| Nurse | 37 | 10.7 |
| **Religion** | | |
| Orthodox | 179 | 51.9 |
| Protestant | 131 | 38.0 |
| Muslim | 24 | 7.0 |
| Other | 11 | 3.2 |
| **Ethnicity** | | |
| Gamo | 137 | 39.7 |
| Gofa | 75 | 21.7 |
| Waleyta | 22 | 6.4 |
| Amhara | 50 | 14.7 |
| Oromo | 31 | 9.0 |
| Others | 30 | 8.7 |
| **Marital status** | | |
| Married | 229 | 66.4 |
| Divorced | 13 | 3.8 |
| Single | 101 | 29.3 |
| Widowed | 2 | 0.6 |
| **Educational status** | | |
| Diploma midwife | 130 | 37.6 |
| Bsc Midwife | 121 | 35.0 |
| Diploma Health officer | 37 | 10.7 |
| BSc health officer | 20 | 5.79 |
| Diploma nurse | 27 | 7.82 |
| Bsc Nurse | 10 | 2.89 |

### Attitude and clinical experiences of obstetric care providers

From the total respondent's, the majority of health care providers, 151(45.5%) had work experience of 3-5 years followed by less than or equal to 2 years' experience 125 (36.2%). More than half of the respondents have not heard about training on active management of the third stage of labor 203 (58.8%). Almost all of the health care providers 326 (94.5%) believe that proper management of an active third stage of labor can prevent post-partum hemorrhage. Above half 194, (56.2%) of health care providers mentioned that labor and delivery ward is not satisfactory to attend labor and delivery (Table 2).

**Table 2. Clinical experiences of obstetric care providers and health facility characteristics in Gamo and Gofa zone, Southern Ethiopia**

| Variables | Frequency | Percent (%) |
|---|---|---|
| **Clinical working experience** | | |
| ≤ 2 years | 125 | 36.2 |
| 3-5 years | 157 | 45.5 |
| > 5 years | 63 | 18.3 |
| **Have you ever heard AMTSL training** | | |
| Yes | 142 | 41.2 |
| No | 203 | 58.8 |
| **If you say yes which types of training you have taken** | | |
| In-service | 113 | 32.8 |
| Pre-service | 29 | 8.4 |
| **Do believe that proper usage of AMTSL can prevent post-partum hemorrhage** | | |
| Yes | 326 | 94.5 |
| No | 19 | 5.5 |
| **Do believe that AMTSL is important to prevent maternal mortality** | | |
| Yes | 321 | 93.0 |
| No | 24 | 7.0 |
| **Do you have conducivedelivery room in your institution** | | |
| Yes | 151 | 43.8 |
| No | 194 | 56.2 |
| **Number of staff in labor and delivery unit** | | |
| 1-3 | 20 | 5.8 |
| 4-6 | 183 | 53.0 |
| ≥7 | 142 | 41.2 |
| **Do you have the availability of drugs for the management of AMTSL** | | |
| Yes | 325 | 97.8 |
| No | 10 | 2.9 |
| **If you said yes which drugs** | | |
| Oxytocin alone | 136 | 39.4 |
| Ergometrn alone | 8 | 2.3 |
| Misoprostol alone | 2 | 0.6 |
| All drugs are available | 196 | 56.8 |
| **Do you have a storage facility for oxytocin** | | |
| Yes | 326 | 94.5 |
| No | 19 | 5.5 |
| **Do you have a standard document to manage AMTSL** | | |
| Yes | 140 | 40.6 |
| No | 205 | 59.4 |
| **Do you have a standard document to manage PPH** | | |
| Yes | 112 | 32.5 |
| No | 233 | 67.5 |

**Practices of obstetric care providers**

Almost all, 87% (n=300) of the study participants examined the abdomen before administering oxytocin drugs. The majority 94.2% (n=325) of the study participants gave the uterotonic drugs within one minute after the delivery of the baby. The majority of health care providers -67.2 % (n=232) performed essential components of active management of the 3rd stage of labor in three consecutive observations and 260 (75.4%) performed CCT correctly (Table 3).

**Table 3. Observational checklist to assess the practice of obstetric care providers on active management of the third stage of labor in Gamo and Gofa zone public health facility southern Ethiopia**

| Items on check list | Observational cheek list to assess practice | | | |
|---|---|---|---|---|
| | Observation 1 | Observation 2 | Observation 3 | Overall Observation |
| Health care provider palpates the abdomen before continuing to give oxytocin | Yes 318(92.2) | 317(91.9) | 317(91.9) | 300(87.0) |
| | No 27(7.8) | 28(8.1) | 28(8.1) | 45(13) |
| The health care provider provides oxytocin within 1 minute of delivery of the baby | Yes 245(71.0) | 241(69.9) | 235(68.1) | 325(94.2) |
| | No 100(29) | 104(30.1) | 110(31.9) | 20(5.8) |
| Health care provider records dose of uterotonic given | Yes 251(72.8) | 259(75.4) | 260(75.4) | 209(60.6) |
| | No 94(27.2) | 86(24.9) | 85(24.6) | 136(39.4) |
| Health care provider clamps and cuts cord for approximately 3 minutes and applies counter traction to stabilize the uterus | Yes 310(89.8) | 303(87.5) | 303(87.5) | 277(80.3) |
| | No 35(10.2) | 42(12.2) | 42(12.2) | 68(19.7) |
| Health care provider waits for strong uterine contraction (2-3 minutes) to apply CCT | Yes 300(87.0) | 243(70.4) | 300(87.0) | 216(62.6) |
| | No 45(13.0) | 102(29.6) | 45(13.0) | 129(37.4) |
| Health care provider applies controlled cord Traction/CCT/ correctly | Yes 283(82) | 280(81.2) | 279(80.9) | 260(75.4) |
| | No 62(18) | 65(19.1) | 66(19.1) | 85(24.6) |
| As the placenta delivers, holds it with both hands and twists slowly so the membranes are expelled intact. | Yes 309(89.6) | 304(88.1) | 309(89.6) | 290(84.1) |
| | No 36(10.4) | 41(11.9) | 36(10.4) | 55(15.9) |
| The care provider performs uterine massage immediately following the delivery of the placenta | Yes 310(89.9) | 312(90.4) | 312(90.4) | 289(83.8) |
| | No 35(10.1) | 33(9.6) | 33(9.6) | 56(16.2) |
| Examine the placenta, membranes, and cord for completeness | Yes 305(88.4) | 306(88.7) | 312(90.4) | 285(82.6) |
| | No 40(11.) | 39(11.3) | 33(9.6) | 60(17.4) |
| Ensures uterus doesn't relax after stopping uterine massage | Yes 301(87.2) | 307(89.0) | 304(88.4) | 278(80.6) |
| | No 44(12.8) | 38(11.0) | 41(11.9) | 67(19.4) |
| Inform & demonstrate to the mother how to massage the uterus every 15 minutes for the first two hours | Yes 221(64.1) | 262(75.9) | 170(49.3) | 144(41.7) |
| | No 124(35.9) | 83(24.1) | 175(50.7) | 201(58.3) |

The finding of this study presented that 166(48.1) of the health care providers demonstrated good practice towards AMTSL

**Factors Associated with the practice of Active management of the third stage of labor**

The result of multivariable analyses showed that

clinical years of experience, having a satisfactory delivery room, and taking in-service training were some of the factors associated with good practice towards active management of the third stage of labor. Respondents with clinical experience 5 years and above were 4.32 times more likely to demonstrate good practice than others (AOR = 4.32; 95%CI: (2.78-9.10). Respondents having in-service basic emergency obstetric care (B-EmOC) training were 2.34 times more likely performing good practice than others with (AOR = 2.34; 95%CI: 1.87-4.46)., Respondents having a satisfactory delivery room were 1.32 times more likely performing good practice than others with (AOR=1.86 95% CI 1.32-2.24. Additionally , health care providers having good knowledge of AMTSL were 3.42 times more likely performing good practice than others AOR=3.42 95% CI 2.78-9.21) (Table 4)

**Table 4. Bivariate and multivariable logistic regression analysis of the practice of AMTSL among obstetric care providers in Gamo and Gofa zone public health facility, southern Ethiopia**

| Variables | Practice of AMTSL | | COR (95%CI) | AOR (95%CI) | P-Value |
|---|---|---|---|---|---|
| | Good | Poor | | | |
| **Sex** | | | | | |
| Male | 66 | 68 | 1.07(0.69-1.66) | 0.45(0.74-2.89) | |
| Female | 100 | 111 | 1 | 1 | |
| **Qualification** | | | | | |
| BSc midwife | 38 | 83 | 0.78(0.40-1.52) | 0.84(0.22-3.48) | |
| Diploma midwife | 89 | 41 | 3.37(1.94-7.15) ** | 1.41(0.39-5.08) | |
| BSc nurse | 9 | 8 | 1.93(0.65-5.76) | 0.49(0.53-4.52) | |
| Diploma nurse | 9 | 11 | 1.40(0.50-3.94) | 0.81(0.10-6.59) | |
| BSc HO | 21 | 36 | 1 | 1 | |
| **Types of training taken** | | | | | |
| In –service BEMOC | 81 | 32 | 1.56(1.03-4.60) * | 2.34(1.87-4.46) * | 0.03 |
| Pre-service | 18 | 11 | 1 | 1 | |
| **Having a conducive delivery room** | | | | | |
| Yes | 92 | 59 | 2.10(1.63-3.91) ** | 1.86(1.32-2.24) * | 0.02 |
| No | 74 | 120 | 1 | 1 | |
| **Clinical years of experience** | | | | | |
| 1-5 years | 162 | 120 | 1 | 1 | |
| >5 years | 4 | 59 | 19.91(3.44-21.1) ** | 4.32(2.78-9.10) * | 0.001 |
| **Do you have the standard document to manage PPH** | | | | | |
| Yes | 64 | 48 | 1.71(1.09- 2.69) * | 0.91(0.31-2.27) | |
| No | 102 | 131 | 1 | 1 | |
| **Knowledge** | | | | | |
| Good knowledge | 146 | 94 | 6.60(2.411-11.78) * | 0.42(0.78-9.21) | |
| Poor knowledge | 20 | 85 | 1 | 1 | |

## DISCUSSION

In this study, the overall AMTSL practices were 48.1% with [95 % CI (43-53). This is lower than the study conducted in the Amhara region of Ethiopia, which showed 61.2% [12] of providers used AMTSL practices. The discrepancy might be due to the study area because the previous study focused only on referral hospitals and used only one observation to check practice of the third stage of labor.This study focused on both health centers and hospitals; additionally, it used three observations to check practices of the third stage of labor. But this result is comparable with similar studies conducted in Addis Ababa and Hawassa, Ethiopia which showed that 44- 47% of health care provides demonstrated good skills towards AMTSL [13,14]. However, the finding of this study is lower than a study conducted in maternity hospitals in Albania, which showed that 78% of health care providers have a good practice of active management of the third stage of labor [15]. The discrepancy might be due to the difference in knowledge and skill of health care providers, or to socio-economic and socio-cultural difference. Additionally, discrepancies might be due to the difference in study period and methods of data collection because this study used three observations to know the status of AMTSL practice. But, the number of those utilizing good practice are higher than studies conducted in Kenya and Nigeria, which found 31.5% and 28.3% of providers utilized good practice respectively [16,17]. The discrepancy might be due to socio-economic and cultural differences. Besides that, it might be due to the knowledge of health care providers. Theremight be a difference in the health care delivery systems.

The finding of this study showed that 94.2% of health care providers provide oxytocin within 1 minute of delivery and the most communally used root of oxytocin administration was intramuscular (IM), which is comparable with other studies conducted in Ethiopia [12-14]. This result was different from the study conducted in the Albanian maternity hospital, which showed that 56% of health care providers gave the uterotonic after cord clamping; intravenous oxytocin was usually the drug used, and 71% clamped the cord within one minute [15]. The discrepancy might be due to the difference in hospital protocol and guidelines used to manage active management of the third stage of labor. Similarly, the findings of the current study showed that health care provider provides oxytocin within 1 min of delivery of baby 94.2%, health care provider applied controlled cord Traction/CCT/ correctly, 75.4%, care provider performs uterine massage immediately following the delivery of the placenta 85.3%. The finding is different from a study conducted in Addis Ababa, Ethiopia, which showed that 77.9% had given oxytocin in the first minute, 89% used controlled cord traction, and 86% performed uterine massage within the first minute after delivery [13-14]. The discrepancy might be due to the presence of updated guidelines and improvement of hospital infrastructures, which is necessary or input for the provision of active management of the third stage of labor.

This study is similar to a qualitative study conducted in India, which found that the majority of health care providers use uterotonic drugs within one minute of labor delivery, control cord traction (CCT), and uterine massage following the delivery of the placenta [18].

The result of multivariable analyses showed that respondents with clinical experience 5 years and above were 4.32 times more likely to perform good practice than others and respondents having in-service BEmOC and other related pieces of training were 2.34 times more likely to perform good practice than others. Also, respondents having satisfactory delivery were 1.32 times more likely to perform good practice than others were. This was consistent with a study conducted in the Amhara region Ethiopia [12].

## CONCLUSION

In this study, the practice of obstetric care providers toward active management of the third stage of labor is still low. Because training, length of years of working experience, and having the presence of

a satisfactory delivery room were factors associated with the practice of the third stage of labor, the governmental and non-governmental organizations which work in health-related activities should plan to give both pre/in-service pieces of training on active management of the third stage of labor-related themes. In addition to this, the governmental and non –governmental organizations working to reduce maternal and child morbidity and mortality should fulfill infrastructure, which is necessary for labor and delivery.

**LIST OF ABBREVIATIONS**

AMTSL: Active management of third stage labor, BEmOC: basic emergency and obstetric care, PPH; Postpartum hemorrhage: WHO: World Health Organization, CCT: controlled cord traction, (ICM: international Confederation of Midwives, FIGO: International Federation of Gynecology and Obstetrics

**COMPETING INTERESTS**

The authors declare that they have no competing interests.

**FUNDING**

Arba Minch University. The university has no role in the design of the study, collection, analysis, and interpretation of the data and in writing the manuscript.

**ACKNOWLEDGMENT**

The authors thank all the study participants and Arba Minch University for financial support.

**CORRESPONDING AUTHOR**

Biresaw Wassihun, MSc.

**College of Medicine and Health Sciences, Arba Minch University, Arba Minch, Ethiopia**

Email: bireswas@gmail.com

## REFERENCES

1. Stanton C, Armbruster D, Knight R, Ariawan I, Gbangbade S, Getachew A, Portillo JA, Jarquin D, Marin F, Mfinanga S, Vallecillo J. Use of active management of the third stage of labor in seven developing countries.
2. World Health Organization. WHO recommendations for the prevention and treatment of postpartum hemorrhage. World Health Organization; 2012.
3. Gülmezoglu AM, Lumbiganon P, Landoulsi S, Widmer M, Abdel-Aleem H, Festin M, Carroli G, Qureshi Z, Souza JP, Bergel E, Piaggio G. Active management of the third stage of labor with and without controlled cord traction: a randomized, controlled, non-inferiority trial. The Lancet. 2012 May 5;379(9827):1721-7.
4. Taylor U DP, Miller S. Prevention and Treatment of postpartum Hemorrhage in Low-Resource Settings. FIGO Guidelines. 2012;117:108–18.
5. Hogan MC, Foreman KJ, Naghavi M, Ahn SY, Wang M, Makela SM, et al. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. The lancet. 2010;375(9726):1609-23.
6. Carroli G, Cuesta C, Abalos E, Gulmezoglu AM. Epidemiology of postpartum hemorrhage: a systematic review. Best practice & research Clinical obstetrics & gynecology. 2008;22(6):999-1012.
7. Ajenifuja K, Adepiti C, Ogunniyi S. Postpartum hemorrhage in a teaching hospital in Nigeria: a 5-year experience. African health sciences. 2010;10(1).
8. Organization WH. Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division: executive summary. 2015.
9. ICF CSACEa. Ethiopia Demographic and Health Survey Key Indicators Report. Addis Ababa, Ethiopia, and Rockville, Maryland, USA CSA, and ICF. 2016
10. Leduc D, Senikas V, Lalonde AB, Ballerman C, Biringer A, Delaney M, Duperron L, Girard I, Jones D, Lee LS, Shepherd D. Active management of the third stage of labor: prevention and treatment of postpartum hemorrhage. Journal of obstetrics and gynecology Canada. 2009 Oct 1;31(10):980-93.
11. Mfinanga GS, Kimaro GD, Ngadaya E, Massawe S, Mtandu R, Shayo EH, et al. Health facility-based Active Management of the Third Stage of Labor: findings from a national survey in Tanzania. Health Research Policy and Systems. 2009;7(1):6.
12. Adane D, Belay G, Arega A, Wassihun B, Gedefaw G, Gebayehu K. Practice and factors associated with active management of the third stage of labor among obstetric care providers in Amhara region referral hospitals, North Ethiopia, 2018: A cross-sectional study. PloS one. 2019 Oct 3;14(10):e0222843.
13. Tenaw Z, Yohannes Z, Amano A. Obstetric care providers' knowledge, practice, and associated factors towards active management of the third stage of labor in Sidama Zone, South Ethiopia. BMC pregnancy and childbirth. 2017;17(1):292.
14. Andualem Henok RY. Factors Associated With Knowledge, Attitude, And Practice Of Midwives On Active Management Of the Third Stage Of Labour At Selected Health Centers Of Addis Ababa, Ethiopia. Resources Development and Management. 2015;10.
15. Bimbashi A, Ndoni E, Dokle A, Duley L. Care during the third stage of labor: obstetricians' views and practice in an Albanian maternity hospital. BMC pregnancy and childbirth. 2010;10:4
16. Raams TM, Browne JL, Festen-Schrier VJ, Klipstein-Grobusch K, Rijken MJ. Task shifting in active management of the third stage of labor: a systematic review. BMC pregnancy and childbirth. 2018 Dec 1;18(1):47.
17. Oladapo OT, Fawole AO, Loto OM, Adegbola O, Akinola OI, Alao MO, Adeyemi AS. Active management of the third stage of labor: a survey of providers' knowledge in southwest Nigeria. Archives of gynecology and obstetrics. 2009 Dec 1;280(6):945.
18. Deepak NN, Mirzabagi E, Koski A, Tripathi V. Knowledge, attitudes, and practices related to uterotonic drugs during childbirth in Karnataka, India: a qualitative research study. PloS one. 2013;8(4):e62801

# IDEAL AGE AT FIRST MARRIAGE IS STILL BELOW THE LEGAL AGE OF MARRIAGE: THE CASE OF ADOLESCENT GIRLS IN WEST HARARGE ZONE, EASTERN ETHIOPIA: A MIXED METHOD STUDY

Wasihun Edossa, MPH[1], Yemane Berhane, MD, PHD[1], Alemayehu Worku, PHD[1], Anene Tesfa, MPH[1], Amare Worku, MD, PhD.[1], Hanna Gulema, MPH[1], Nebiyou Fasil, MPH[1], Dagmawit Tewahido, MPH[1], Selamawit Tesfaye, MPH[1]

## ABSTRACT

**BACKGROUND:** Early marriage is a harmful practice associated with serious adverse health and social outcomes. It is common practice in male dominated societies. Ethiopia has legislative provisions and stakeholders advocating for abolition of early marriage; however, the practice appears to continue due to perceived ideal age, which has not been monitored regularly. The aim of this study was to determine the ideal age at first marriage among adolescent girls and assess the role of girls' reference groups for early marriage in West Hararge Zone, Eastern Ethiopia.

**METHODS:** Descriptive analysis of ideal age at first marriage was done as part of a large cross-sectional survey. Participants were adolescent girls 13-17 years of age, male reference groups, and female reference groups. Both quantitative and qualitative data were used. Data were cleaned with SPSS version 20 and analyzed by STATA/SE version 13 and summarized by descriptive statistics. A thematic data analysis approach was utilized to summarize qualitative data.

**RESULTS:** The mean age which adolescent girls reported to be ideal at first marriage was 16.96 (95% CI: 16.81,17.11). Qualitative component of the study also revealed that girls still marry between ages of 12 and 15 years. Family, peer pressure, marriage intermediaries and community as a whole were found to influence decisions of young adolescent girls to marry early.

**CONCLUSION:** In conclusion, the age which adolescent girls reported as the ideal age for marriage in selected districts of west Hararge is below legal age of marriage in Ethiopia which is 18 years. This implies early marriage is still common practice in this study area. Since the role of family, peers, religious, and community leaders is relevant, in addition to young adolescent girls, working with all influential groups and communities as a whole could be necessary to decrease and eliminate early marriage.

**KEY WORDS:** Ideal age, first marriage, Legal age, early marriage, Ethiopia

(The Ethiopian Journal of Reproductive Health; 2021; 13;19-26)

1 Addis Continental Institute of Public Health

## INTRODUCTION

Early marriage, defined as marriage before the age of 18, is an issue that disproportionately affects women and girls. The term "early marriage" describes a marital union by people who are below 18 years of age. It can be considered as a harmful practice that can be both a cause and an outcome of reproductive rights violations [1]. Early marriage is common in male dominated societies and cultures [2]. Global and national evidences show early marriage is high in some communities and it has its own deep cultural and economic foundations in favor of early marriage. Though early marriage is declining globally, it remains high in sub-Saharan Africa and south Asia [3,4]. In 2012 UNICEF estimated 400 million women globally aged 20-49 got married before 18 years of age [(5)]. Similarly, a study done in India shows 7% of 20–24 year old females are married by age 15 [6]. According to report by the International Center of Research on Women (ICRW), the percentage of girls married before age of 18 ranged from 41% for Tanzania and 74.5% for Niger, while 49.2 % for Ethiopia. [7]

In Ethiopia women tend to marry considerably earlier than men. An Ethiopian demographic and health survey of 2016 shows the median age at first marriage was 17.1 years among women age 25-49 and 23.8 years among men in same age range. Similarly, fifty-eight percent of women and only 9% of men in the 25-49 age range married before their 18th birthday [8,9]. Early marriage affects girls' health, education, and psychological wellbeing. It leaves most girls out of school and exposes them to health risks related to sexually transmitted infections and pregnancy related complications which repeat the cycle of poverty [5].

Studies show married adolescent girls (15-19) years do have a higher chance of acquiring HIV infection when compared with unmarried counterparts. Additionally, being married is associated with frequent unprotected sex [4]. Evidences shows adolescent girls younger than 15 years are 5 times more likely to die in childbirth than those greater than 20 years of age [7]. Not only adolescent girls, but also their children face risk of malnutrition and low birth weight which compromise their cognitive ability [10]. Although most African countries have civil laws prohibiting child marriage and setting a minimum age for marriage, the situation remains persistent in part because of strong traditional and religious practices that hinder enforcing the law [11]. A study conducted in Nigeria shows early marriage is deeply entrenched in culture, tradition, and religion [12]. In areas where poverty is deeply rooted, child marriage offers opportunity to enlarge the social network in which girls their family depend during times of need. [13]

Lack of autonomy on issues that seriously affect their health and wellbeing leaves adolescent girls in compromised situations. Findings from Northwest Ethiopia indicated that girls whose parents perceive ideal marital age to be less than 18 were 3 times higher in practicing early marriage than those mentioned above 18 years of age [14]. Studies show among the interventions on ending early marriage, shifting gender norms by intervention targeting influential people and adolescent girls' family has been successful [15]. The impact of adolescent girls' education on delaying early marriage was also found to be significant in Ethiopia. When compared with those with no education, adolescent girls with primary and secondary education are found to marry 2 to 7 years later [16]. Ideal age in this paper is defined as the age at first marriage which adolescent girls and male reference groups report to be appropriate.

This study tries to determine ideal age for first marriage among adolescent girls and assess the role of reference groups on early marriage in west Hararge, eastern Ethiopia.

## METHODS AND MATERIALS

### Study setting, design and period

West Hararghe zone is composed of 13 Woredas (administrative areas) and one town. Based on the 2007 Census, the estimated population is 1,871,706. Women and girls account for 48.8% of the population. This paper presents description of

ideal age at first marriage of girls as part of large cross-sectional survey. It is part of baseline assessment for a project to improve adolescent reproductive health and nutrition through structural solutions (Abdi Boru project) in west Hararge zone of Oromia Regional State, Ethiopia. Qualitative data from in-depth interviews, focus group discussions and key informant interviews were used in addition to quantitative findings. The baseline survey was conducted from May 2016 to August 2016.

**Study population**

To prepare this paper, quantitative and qualitative data were primarily drawn from adolescent girls 13-17 year of age. The quantitative data were obtained from two individuals per household who are female and male people who were believed to influence decisions made by index girls. Similarly, besides the girls, participants of the qualitative study were female and male influential people to adolescent girls including parents, husbands, siblings, and in-laws. Selected key informants who were believed to be influential related to the girls' marriage were also part of the study population.

**Sample size determination**

The sample size was calculated assuming a reduction of early marriage from 22% to 15%, a 5 percent level of significance, 90 percent power, average cluster size of 30, a design effect of 1.5 and 10% non-response rate. Accordingly, a total of 3,420 adolescent girls, 3,420 male reference group members (influential people) and 3,420 female reference group in 3,420 households were included in the survey. For the qualitative part, purposive sampling with maximum variation technique and decided the sample size based on saturation. Accordingly, 20 focus group discussions, 32 in depth interviews, and 36 key informant interviews were conducted.

**Sampling technique**

A two-stage cluster sampling method was employed. A list of development army (a sub division of kebele) in each kebele was obtained from administration offices of the study districts and considered as clusters. In the first stage, 38 clusters were selected using simple random sampling technique in each selected woreda. In the second stage, a complete census of households and populations in the selected clusters was done to identify households with eligible adolescent girls aged 13-17 years. Based on the complete census conducted prior to data collection, 30 households were selected randomly using a computer-generated random number. Respondents for the qualitative study were recruited using purposive sampling. For focus group discussions (FGDs) and in-depth interviews (IDIs) the main criteria for selection were permanent residence in the study kebele and willingness to participate in the study. Key informants were selected from woreda offices and schools in the woreda.

**Data collection tools, procedure and analysis**

Quantitative data were collected using a structured and pre-tested questionnaire. All study tools were first developed in English and then translated into the local language, Afan Oromo. The ODK (Open data Kit), an electronic data collection program, was used to record data. Data were transferred to SPSS version 20 for further cleaning. Then the cleaned data were transferred on to STATA/SE version 13 statistical software for data analysis. Descriptive analysis of socio demographic data and information related with ideal age for first marriage was done. Frequency and percentages were used to present findings.

For the qualitative part, Focus Groups Discussions (FGDs), In-depth interviews (IDIs) and key informant interviews (KIIs) guides were first prepared in English. Then, these tools were translated into the local language 'Afan Oromo' by research assistants who were competent in both languages. Interview guides were thoroughly prepared by public health and social studies researchers in order to capture social norm related insights of the community. Purposive and snowball sampling was employed to recruit participants. Semi-structured questions, as well as vignettes were used to ensure trustworthiness of the collected information. Codebook was prepared in combination of both deductive and inductive approaches. Data analysis was assisted

by a computer software (Open Code version 4.02). A thematic data analysis approach was utilized to synthesize the data.

**Operational definition**

**Ideal age at first marriage:** Age at first marriage mentioned by adolescent girls and reference groups as appropriate.

**Legal age of marriage:** Legal age of marriage in Ethiopia is considered 18 years.

**Actual age of marriage**: Age at which adolescent girls married.

**Female reference:** Female influential person for the adolescent girl in the household such as mother, sister, mother-in-law and sister in-law.

**Male reference:** Male influential person for the adolescent girl in the household such as father, brother, husband, father-in-law and brother in-law.

## ETHICAL ISSUES

The research protocol was reviewed and approved by the Ethical Review Board of Addis Continental Institute of Public Health, (IRB Number 0029). Informed consent was obtained from all participants. All interviews among the study participants took place in a private setting.

## RESULTS

A total of 3420 adolescent girls aged 13 – 17 years were expected to participate in the study; 3186 (93.16%) actually participated. The majority of the girls 2811 (89.24%) were never married, 77% have attended at least primary education, 50.51% were students at the time of the survey, and 87.9% were Muslims (Table 1).

**Table 1: Socio demographic characteristics of adolescent girls (13-17 years old) in west Hararge zone, Oromia region, eastern Ethiopia, 2016.**

| Characteristics | | Frequency | % |
|---|---|---|---|
| **No. of adolescents visited** | | 3420 | |
| **No. of adolescents responded** | | 3186 | 93.16% |
| **Girls' educational status** | Never attended | 583 | 18.51% |
| | Primary(1-8) | 2427 | 77.05% |
| | Secondary (9-12) | 140 | 4.44% |
| **Fathers' educational status** | Never attended | 2086 | 66.22% |
| | Ever attended | 1064 | 33.78% |
| **Mothers educational status** | Never attended | 2621 | 83.21% |
| | Ever attended | 529 | 16.79% |
| **Religion** | Muslim | 2770 | 87.94% |
| | Orthodox | 335 | 10.63% |
| | Protestant | 8 | 0.25% |
| | Catholic | 35 | 1.11% |
| | Others | 2 | 0.06% |
| **Marital status** | Never married | 2811 | 89.24% |
| | Married/living together | 253 | 8.03 % |
| | Divorced | 66 | 2.10% |
| | Separated | 20 | 0.63% |
| **Ethnicity** | Oromo | 3043 | 96.60% |
| | Somali | 1 | 0.03% |
| | Amhara | 106 | 3.37% |
| **Occupation** | Farmer or Family farm work | 481 | 15.27% |
| | Household work/housewife | 767 | 24.35% |
| | Student | 1591 | 50.51% |
| | Others | 311 | 9.87% |

Similarly, a total of twenty Focus Groups Discussions with married and unmarried adolescent girls, adolescent boys, and parents of adolescents were conducted using locally developed vignettes. A total of 32 in-depth interviews with married and unmarried adolescent girls, husband of adolescent girls and mothers-in-law was conducted using in-depth interview guides. In addition, 36 key informant interviews were conducted with 7 government woreda level officials using semi-structured interview guides.

**Ideal age at first marriage**

The reported average ideal age at first marriage for adolescent girls was 16.96 (95% CI: 16.81, 17.11), Female and male references said that ideal age for girls to get married was 17.58(95% CI: 17.44, 17.73) and 17.63(95% CI: 17.53, 17.73) respectively. Adolescent girls who reported the ideal age at first marriage to be below 18 years of age were 44.9 % and all of those ever-married adolescent girls married before their 18th birth day (Table 2).

**Table 2: Adolescent girls and reference groups' response on ideal age of marriage in west Hararge zone, Oromia region, eastern Ethiopia, 2016**

| | Respondents | Mean ideal age at 95% CI |
|---|---|---|
| 1 | Adolescent girls thought about ideal age for first marriage | 16.96 (16.81-17.1) |
| 2 | Female references thought on ideal age for first marriage | 17.58 (17.44-17.7) |
| 3 | Male references thought on ideal age for first marriage | 17.63 (17.53-17.73) |
| 4 | Actual age at marriage of those ever married | 13.76 (13.49-14.02) |

Among adolescent girls participating in the study, 339 (10.6%) of them were married. The median age at their first marriage of those ever-married adolescents was 15 years; all of them married below 18 years of age. According to the qualitative findings, most adolescents would accept a marriage proposal at the perceived ideal age; which is around 15 years in the study area.

"If a girl refuses a marriage proposal, she is considered as if she has made a big mistake in her life, both by the community and her friends. It is conceived as if she missed out her chance. Even she will not get a boyfriend after that, people say she may also have another problem like health problems or she is abnormal so on average they marry at 15 and 16 years of age" according to one Unmarried adolescent boy.

Most of the participants have information about legal age of marriage in the country which is 18 years. Some of the parents mentioned that they may face punishment by the local government authorities if they marry their girls before the age of 18.

While it was generally assumed that early marriage is decreasing, most participants of the study revealed that girls still commonly marry between ages of 12 and 15 years. Some of the discussants mentioned 16 -17 years of age. When the girls marry at this early age, the majority of them discontinue their education.

"Most of the students when they complete grade 7, they discuss with their groups and engage in marriage. Even though their age is too small reaching 12 and 13, they rash to marriage. Their parents also did not say anything on such issues because they do not have enough awareness on education." Married adolescent girl.

This study also shows 44.9% of adolescent girls responded that the ideal age at first marriage is below 18 years of age and all of those ever-married adolescent girls married before their 18th birth day. Community and reference groups were also found to have considerable to influence on adolescent girl's decision to marry early.

"In this community, girls would marry at the age of 15 and below. The major reason that makes them get married at this age is peer pressure. if a girl is beautiful and her family has large farm land, she will immediately engage to marriage even while she is below the mentioned age. If girls do not get married at 15, they will be disgraced and this will enforce them to make wrong decisions." Husband of adolescent girl.

The influence of community and family on the acceptability of early marriage is revealed by the qualitative finding. Pressure and sanctions from family, marriage intermediaries and community were found to be influential.

"The community's opinion and insult affect her very much. More than mother's opinion and insult, the neighbors are hurtful to those girls." Women Association officer "I can say the big influence is played by intermediaries; they strongly talk to her for negotiation. Adolescent girls of same age help intermediaries by bringing the lady to him to discuss in person." Women Association officer.

Fathers of adolescent girls also emphasized that early marriage of girls is customary in the study area due to the different pressures. Eighteen is perceived as the maximum limit age that girls can remain unmarried by whom? .(the community? The family?) "When intermediaries come, we collaborate with them and marry even girls who are 14 or 15 years old. Most girls in this local area normally marry between the age of 14- 18. If a girl could not find a husband and remains single elapsing 18 years of age she will be called "haftu" meaning, the one who could not find a man. Thus, people say to girls once your time is over you cannot find a man so get married before that happens." Father of adolescent girl

## DISCUSSION

Findings of this study show ideal age for first marriage is still below legal age of marriage in Ethiopia, which is 18 years. The average ideal age at first marriage mentioned by adolescent girls was 16.96 at 95% confidence interval (16.81-17.1). Median age at first marriage of those ever married is 15 years which is similar with the Ethiopian demographic and health survey report of 2011 and 2016 which shows median age at first marriage among women aged 25-49 to be 16.5 and 17.1 respectively [8].

This is supported by reports from many African countries and south Asian countries which shows persisting early marriage practices contrary to reduction seen at the global level. [7]

Both quantitative and qualitative results of this study are consistent indicating low ideal age at first marriage. Reference groups (influential people to adolescents) have also mentioned the ideal age of marriage to be below 18 years. A report by UNICEF in 2016 was based on analysis of 2007 Ethiopian demographic health survey data which indicated that there are numerous factors which influence decisions to marry at an early age. Similarly, variations were observed among regions of Ethiopia and even at zone and district level indicating existence of microclimate regarding early marriage.[17]

Though there are legal frameworks in many countries, decision regarding age of marriage is influenced by family, peers, and norms in the community and religion [7]. Findings from Nigeria indicated religious leaders have a role in marriage related decisions [12]. This is similar to findings of this study, which revealed if adolescent girls do not get married early, it is considered as shame and has backlash, but boys are not expected to marry as early as girls. Another study done in Northwest Ethiopia shows family income, perceived ideal age of marriage, and knowing legal age of marriage were determinants of early marriage [14].

In this study, qualitative results show there are also other drivers like peer pressure and family's' economic status which contribute to the decision to marry early. This is supported by a study which assessed early marriage in Africa which concluded with "countries with highest rate of poverty are also with highest rate of early marriage and highest population growth rates" [18]. Similarly another study in Ethiopia shows that in areas where girls'

education and employment is limited, marriage is considered as a rational option by parents [2].

When age at marriage is below the legal age, the consequences related with early marriage continue. In this study area, persistence of early marriage could be due to lack of disapproval by community and mentioned drivers, such as poverty.

Finally, this study revealed age at first marriage accepted as ideal age by adolescent girls and reference groups is below legal age of marriage in Ethiopia. This indicated commonness and approval of early marriage in the study setting. The study used adequate sample size, data was collected by professionals with adequate knowledge of the locality, and carefully designed questionnaires and interview guides were utilized. Therefore, the findings likely represent the actual situation in west Hararge where the majority of people share similar lifestyle, religion and culture.

One of the limitations of the study is that people may not know their exact date of birth and age, which they self-reported in the study. There are no adequate studies done in Ethiopia on ideal age except data on actual age at first marriage. Ideal age at first marriage does not equate with actual age at first marriage but it can indicate commonness of early marriage. To gain additional understanding, more segmented analyses are needed that cover not only geographic variety, but religion, ethnicity, education, and social class to know the differences among countries regarding child marriage [9].

## CONCLUSION AND RECCOMMENDATION

Ideal age at first marriage of adolescent girls' in selected districts of west Hararge is below the legal age of marriage in Ethiopia. This implies early marriage is not discouraged and could remain common practice in this study area unless intervention occurs. Intensifying interventions to end early marriage of adolescent girls' is crucial. Since the role of family, peers, religious and community leaders is influential, working with all influential group and community as a whole could be necessary to decrease and eliminate early marriage.

## ACKNOWLEDGEMENT

We would like to thank, West Hararge zone administration and sector offices for their continuous support during the survey, we would also like to thank all community members who tirelessly responded to the questions.

## COMPETING INTERESTS

The authors declare no conflict of interest for this study

## CORRESPONDING AUTHOR

Wasihun Edossa Toli, MPH
Addis Continental Institute of Public Health
Email: wasihuneaciph@gmail.com
wasihunchange@gmail.com

## REFERENCES

1. Jones, N., Tefera, B., Emirie, G., Gebre, B., Berhanu, K.Presler-Marshall, E., Walker,D. Gupta, T. and Plank, G.. The patterning and drivers of child marriage in Ethiopia's hot districts. 2016. 2016.
2. Pankhurst, A. Child marriage and female circumcision (FGM/C): Evidence from Ethiopia. 2014;
3. UNICEF. The state of the world's children 2016: A fair chance for every child. New York: UNICEF. 2016.
4. Clark S, Bruce, J, Dude, A. Protecting young women from HIV/AIDS: the case against child and adolescent marriage. International family planning perspectives. 2006;79–88.
5. UNICEF. Progress for children: A report card on adolescents (Number 10, April 2012). New York, Division of Communication. 2012;
6. IIPS I. National Family Health Survey (NFHS-4), 2015–16. International Institute for Population Sciences (IIPS), Mumbai, India. 2017;
7. Walker J-A. Early marriage in Africa–Trends, harmful effects and interventions. African journal of reproductive health. 2012;16(2):231–240.
8. Ethiopia Demographic and Health survey. Addis Ababa, Ethiopia and Rockville, Maryland, USA: CSA and ICF.: Central Statistical Agency; 2016 Jul.
9. Erulkar, A. Early marriage, marital relations and intimate partner violence in Ethiopia. International Perspectives on Sexual and Reproductive Health. 2013;6–13.
10. Santhya, KG. Early marriage and sexual and reproductive health vulnerabilities of young women: a synthesis of recent evidence from developing countries. Current opinion in obstetrics and gynecology. 2011;23(5):334–339.
11. Union, A. Campaign to End Child Marriage in Africa: The Effects of Traditional and Religious Practices of Child Marriage on Africa's Socio-Economic Development (Addis Ababa, Ethiopia: African Union). 2015.
12. Adedokun, O., Adeyemi, O., Child, D. Marriage and maternal health risks among young mothers in Gombi, Adamawa State, Nigeria: implications for mortality, entitlements and freedoms. African health sciences. 2016;16(4):986–999.
13. Boyden, J, Pankhurst, A, Tafere Y, Draft ,F. Harmful Traditional Practices and Child Protection: Contested Understandings and Customs of Female Early Marriage and Genital Cutting in Ethiopia. Available at: View. 2011;
14. Workineh, S, Kibretb, GD, Degu, G. Determinants of early marriage among female children in Sinan District, Northwest Ethiopia. Health Science Journal. 2015;9(6):1.
15. Gage, AJ. Child marriage prevention in Amhara Region, Ethiopia: Association of communication exposure and social influence with parents/guardians' knowledge and attitudes. Social Science & Medicine. 2013;97:124–133.
16. Marshall, EP, Lyytikainen, M, Jones, N, Montes, A, Pereznieto, P, Tefera, B. Child marriage in Ethiopia. London: Overseas Development Institute (ODI); 2016.
17. Marshall, EP, Lyytikainen, M, Jones, N, Montes A, Pereznieto P, Tefera B. Child marriage in Ethiopia. 2016.
18. Walker, J-A. Early marriage in Africa–Trends, harmful effects and interventions. African journal of reproductive health. 2012;16(2):231–240.
19. Greene ME. Ending Child Marriage in a Generation. What Research is Needed. 2014;

.

# IMPACT OF UTILIZING THE WHO SAFE CHILDBIRTH CHECKLIST ON REDUCING MATERNAL AND PERINATAL DEATH: A SYSTEMATIC REVIEW AND META-ANALYSIS

Lemi Belay Tolu, MD[1], Tadesse Urgie, MD[1], Balkachew Nigatu, MD[1], Thomas Mekuria, MD[1]

## ABSTRACT

**BACKGROUND:** The World Health Organization (WHO) Safe Childbirth Checklist (SCC) is a 29-item checklist designed to address the primary cause of maternal death, intrapartum stillbirth, and early neonatal death. The objective of this review was to locate literature reporting on the effect of utilizing the WHO safe childbirth checklist on maternal and perinatal death.

**METHODS:** We searched MEDLINE, google scholar, Cochrane Central Register of Controlled Trials (CENTRAL), met-Register of Controlled Trials (m-RCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov) and the WHO International Clinical Trials Registry Platform (ICTRP) (www.who.int/stop/search/en) to retrieve all available comparative studies published in English after 2008. Two reviewers did study selection, critical appraisal, and data extraction independently. We did a random or fixed-effect meta-analysis to pool studies together and effect estimates were expressed as an odds ratio. Quality of evidence for major outcomes was assessed using the Grading of Recommendations, Assessment, development, and evaluation (GRADE).

**RESULTS:** We retained two cluster randomized trials and three pre-and-post intervention studies reporting on WHO SCC's. The WHO SCC utilization reduced still birth (OR =0.92[95% CI 0.87-0.96]). However, the utilization of the checklist had no impact on early neonatal death (OR=1.07[95%CI [1.01-1.13]) and maternal death (OR =1.06[95% CI 0.77-1.45]).

**CONCLUSION:** WHO SCC was effective in reducing stillbirth. Moderate quality of evidence indicates that WHO SCC reduce stillbirth, whereas low and very low quality of evidence suggests that WHO SCC has no impact on maternal and early neonatal death, respectively. A lot of things might contribute to perinatal and maternal death. Therefore, it is imperative to contextually modify the checklist (WHO safe childbirth checklist) to address major events contributing to intrapartum maternal death, still birth and early neonatal death.

**KEY WORDS:** Maternal health, Newborn health, WHO Safe Childbirth Checklist, maternal mortality, perinatal mortality.

(The Ethiopian Journal of Reproductive Health; 2021; 13;27-37)

1 Department of Obstetrics and Gynaecology, Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

## INTRODUCTION

The World Health Organization (WHO) estimates nearly 2,87,000 maternal deaths, 1 million intrapartum related stillbirths, and 3 million newborn deaths during the neonatal period per year [1]. As a solution, the World Health Organization (WHO) has introduced a safe childbirth checklist(SCC) in 2008, a 29-item evidence-based essential childbirth practice to help health-care workers to deliver consistently high quality maternal and perinatal care [2]. The WHO Safe Childbirth Checklist (SCC) incorporates major causes of maternal death, intrapartum stillbirth, and early neonatal death and expected to have an impact on maternal and perinatal morbidity and mortality [3].

One observation study reported that SCC has no impact on perinatal or maternal mortality [3]. Another prospective interventional study conducted at a tertiary care hospital in India found that implementation of a safe childbirth checklist has no impact on maternal or neonatal mortality reduction. However, there was increased partograph use, antibiotic administration, and active management of the third stage of labour [4]. The Better-Birth trial in north India, where peer coaching was used to increase adherence of workers to WHO SCC at sub-district and primary health care facilities, reported a significant increase in health care worker's adherence to essential practices. However, the study indicated that the utilization of the tool didn't reduce perinatal and maternal death [5].

A recent quasi-experimental study conducted in the Rajasthan district of India found out that implementation of SCC program potential averts 40,000 intrapartum deaths per year, the most reduction being from prevention of stillbirths [6]. Contradicting results from different studies on WHO SCC's impact on maternal and perinatal death despite an improvement of essential practices mandates searching for robust evidence on the effectiveness of SCC implementation on reduction of maternal and perinatal deaths. Therefore, this systematic review is aimed to investigate the effectiveness of utilizing the WHO safe childbirth checklist on improving maternal and perinatal deaths (still births and early neonatal death).

**Review question(s)**

The review sought to locate international literature reporting on the impact of WHO SCC utilization. Specifically, the review questions were:

- What is the effectiveness of the WHO safe childbirth checklist on improving maternal death?
- What is the effectiveness of the WHO safe childbirth checklist on reducing perinatal death?

## METHODS

This systematic review was prepared using PRISMA reporting guidelines (S2 table) for systematic reviews [7]. The review was conducted per Cochrane handbook for a systematic review of interventions [8], and a prior protocol registered in PROSPERO 2019, CRD42019137092 available at https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=137092. During the conduct of the review, we considered the following inclusion criteria:

**Participants**

For the sake of this review, we considered health professionals directly involved in the care for mothers and newborns during labour, delivery, and post-partum periods and mothers and newborns in any health care settings.

**Intervention**

The intervention we considered for this review was the utilization of the WHO safe childbirth checklist by health professionals.

**Comparator**

The comparator considered for this review was labouring mothers and newborn care without WHO safe childbirth or any other structured checklist.

**Outcomes:**

The outcomes considered for this review were the incidence of early neonatal death, stillbirth and maternal death.

**Early neonatal death (END):** Death of newborn within seven days of delivery.

**Stillbirth:** Intrapartum foetal death after the admission of the patient for labour and delivery. Studies that included foetal death before admission of the patient to a health facility were excluded. For this review, we defined perinatal death as intrapartum stillbirth and newborn death within seven days of delivery

**Maternal death:** the death of mothers caused by obstetric related events within the health facilities.

Maternal morbidity: blood transfusion, hysterectomy, maternal sepsis, postpartum bleeding, and maternal seizure.

**Types of studies**

This review considered all studies with comparative designs, such as randomized controlled trials (RCTs), and, before and after studies published from 2008 to November 11/2019(the day literature search was done) in English. This date range was selected because the WHO safe childbirth checklist was introduced in 2008 [2].

**Search strategy**

An initial limited search of MEDLINE was undertaken, followed by an examination of the text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles. A second search using all identified keywords and index terms was then undertaken across all included databases. Thirdly, the reference list of all identified reports and articles was searched for additional studies. The data basis searched were: MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), met-Register of Controlled Trials (m-RCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov) and the WHO International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictrp/search/en). Likewise, a search for grey literature was conducted using Google Scholar, Open-Grey (System for Information on Grey Literature in Europe) (www.opengrey.eu/), and WHO websites. A detailed search strategy for MEDLINE was provided in a supplementary file (S1 table).

**Study selection**

Following the search, all identified citations were loaded into EndNote, and duplicates were removed. Two independent reviewers screened titles and abstracts for assessment against the inclusion criteria for the review. The full texts of potentially eligible studies were retrieved and assessed in detail against the inclusion criteria by two independent reviewers.

**Assessment of methodological quality**

Eligible studies were critically appraised by two independent reviewers for methodological quality, using Cochrane risk of bias assessment tool from Rev man [8]. All disagreements that arose were resolved through discussion and, there was no requirement for a third reviewer. All studies regardless of the results of their methodological quality were undergone data extraction, and the results of critical appraisal were reported in narrative form and a table.

**Data extraction and synthesis**

We extracted data using the Rev Man version 5.3. The relevant information such as population characteristics, authors, study setting, study design, publication year, interventions, and summary of the findings was extracted. Where necessary, we asked primary authors to provide additional information on the articles. Studies were pooled in a statistical meta-analysis using Rev Man version 5.3. Effect sizes were expressed as odds ratios (for dichotomous data), and their 95% confidence intervals were calculated for analysis. We assessed heterogeneity statistically using the Tau2 and I2 tests. We considered I2 tests above 50% as indicative of significant heterogeneity. Besides, the statistical heterogeneity among studies was checked in terms of study settings, sample size, and study design. We conducted leave out analyses by excluding studies with very large or very low effect estimates and different study designs. Also, we compared the random and fixed-effects model, and the decision was made based on the best-fitting model to the data [9].

The certainty of the quality of evidence was assessed using a software package (Grade pro) developed by

the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) [10], group for the following outcomes: neonatal death, stillbirth, and maternal death.

## RESULTS

The search yielded a total of 458 records. After removing duplicates, 130 documents were retained for further examination. After screening the titles and abstracts, 9 papers were retained for full-text review. Based on pre-defined inclusion criteria, five records were included in the systemic review.

From four studies excluded by reason, two (Delaney et al 2017 [11] and Kara et al 2017 [12]) reported on the impact of peer coaching on adherence to WHO SCC and one study (Patabendige, M and Senanayake, H. 2018 [13]) reported effects of Sri-Lanka context-specific modified WHO Safe Childbirth Checklist on adherence to WHO SCC. One cross-sectional study was excluded because of the non-comparative nature of the study (Patabendige, M and Senanayake, H. 2015 [14]).

### Characteristics of included studies

All the five studies included compared WHO SCC use to none use of WHO SCC. Among the five studies included in this review, Varghese et al(6) and Semrau et al [15], reported on the finding of a randomized cluster trial conducted in India. Also, another two pre-and-post intervention studies were conducted in India (Spector et al. 2012 [3], and Varaganti et al. 2018 [4]). One pre-and-post intervention studies was conducted in Namibia (Kabongo et al. 2017 [16]. One study was conducted at a tertiary health facility (Varaganti et al 2018 [4]) whereas two (Kabongo et al. 2017 [16], and Varghese et al. 2019 [6]) at the district health facility, the other two studies (Semrau et al. 2017 [15] and Spector et al. 2012 [3]) at the subdistrict health facility (Table 1).

**Table 1: Characteristics of included studies.**

| Study ID. | Study design | Setting/country. | Participants | Number of participants in Intervention (WHO SCC)/comparison (Without WHO SCC) groups | Outcomes |
|---|---|---|---|---|---|
| Kabongo et al 2018(16) | pre-and-post intervention. | District hospital /Namibia | Labouring mothers and newborns. | Intervention: 1526 Comparasion:1401 | Perinatal outcome. |
| Semrau et al 2017(15) | Cluster randomized., | Subdistrict hospital and primary and community health centers/India. | Labouring mothers and newborns. | Intervention: 1048 Comparasion:1090 | perinatal outcome, maternal death, and morbidity. |
| Spector et al 2012(3) | pre-and-post intervention. | Subdistrict hospital /India. | Labouring mothers and newborns. | Intervention: 639 Comparasion:405 | Perinatal outcome. Maternal death. |
| Varaganti et al. 2018(4) | pre-and-post intervention | Tertiary hospital /India. | Labouring mothers and newborns. | Intervention: 620 Comparasion:635 | Maternal death. Perinatal outcome. |
| Varghese et al., 2019(6) | Cluster -randomized. | District/secondary level facility/India | Labouring mothers and newborns. | Intervention: 77231 Comparasion:59800 | -Stillbirth. -Early neonatal death. |

The methodological quality of the included studies Five of the Included studies were judged to be risk for allocation concealment, whereas three and two of included studies were judged to be high and low risk for random allocation respectively (Fig 1).

**Allocation**

There is no central allocation in five of the included studies. Two studies were cluster-randomized (Varghese et al. 2019 [6] and Semrau et al. 2017 [15],). Three studies pre-and-post intervention studies (Kabongo et al. 2017 [16], Spector et al. 2012 [3] and Varaganti et al. 2018 [(4)]) (Fig 1).

**Incomplete outcome data (Attrition Bias)**

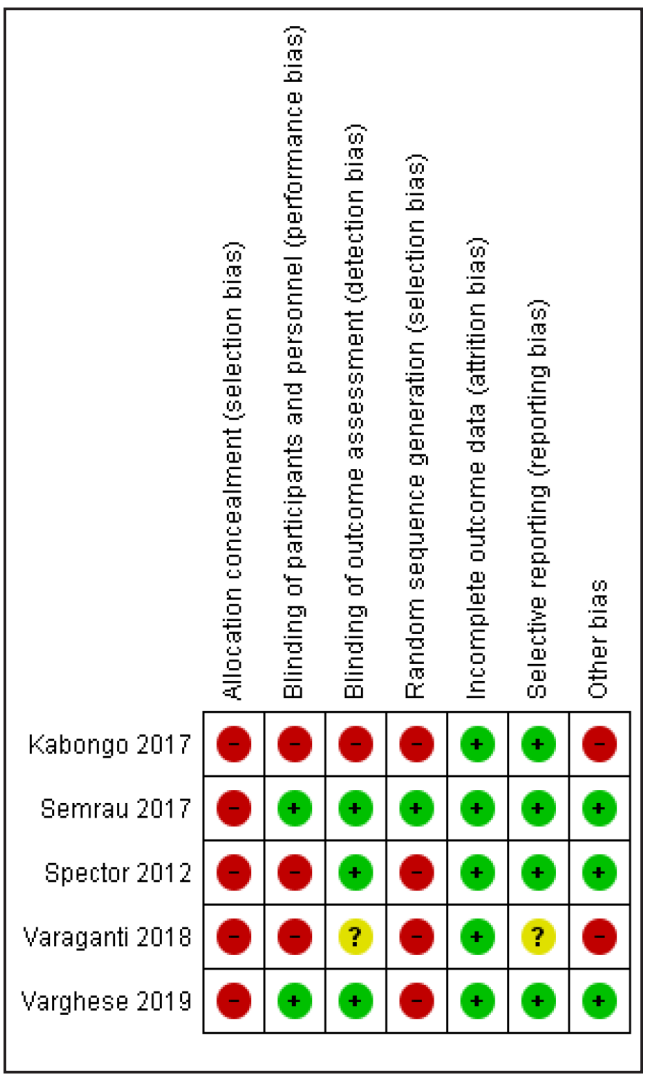


**Fig 1: Risk of bias summary: review authors' judgments about each risk of bias item for each included study.**

Five of the included studies were at low risk of attrition bias (Fig 1).

**Blinding of participants (performance Bias)**

Blinding of health professionals is not possible in all studies as it involves training and introduction of the checklist. Still, two of the studies are cluster randomized with similar data collection for both control and intervention facilities (Varghese et al. 2019 [6] and Semrau et al. 2017 [15]). Three studies collected data by observation of health workers practice which might have introduced hawthorn effect Kabongo et al. 2017 [16], Spector et al. 2012 [3], and Varaganti et al 2018 [4]) (Fig 1).

**Blinding of outcome assessment**

Data collectors didn't know intervention and control facilities in two studies (Varghese et al. 2019 [6] and Semrua et al. 2017 [15]). In two studies data collectors were not blinded but used a pre-defined checklist and unlikely to affect the outcome of the study (Kabongo et al. 2017 [16], and Spector et al. 2012 [3]). However, investigators were involved in data collection in Kabongo et al. 2017 [16] study and data collection methods not reported by Varaganti et al. 2018 [4] (Fig 1).

**Selective reporting (reporting bias)**

Four studies used a pre-defined data collection protocol, and all outcomes of interest were reported. One study didn't use a clear study protocol (Varaganti et al. 2018 [4]) (Fig 1).

**Other potential sources of bias**

Two cluster-randomized studies considered design effect during a sample size calculation, had a control group, and had similar baseline similarity in terms of health professionals (Varghese et al. 2019 [6] and Semrua et al. 2017 [15]). Three of the studies were pre-and-post-intervention without a control group and didn't consider the design effect. Still, all had similar baseline health professionals (Kabongo et al. 2017 [16], Spector et al. 2012 [3], and Varaganti et al. 2018 [4]) (Fig 1).

## REVIEW FINDINGS

### 1. Stillbirth

Utilization of WHO SCC by health professionals reduces fresh stillbirth by 8% compared to none use of WHO SCC (OR 0.92, 95% CI 0.87-0.96, I2= 0%, five studies, 299,952 participants, moderate quality of evidence) (Fig 2).

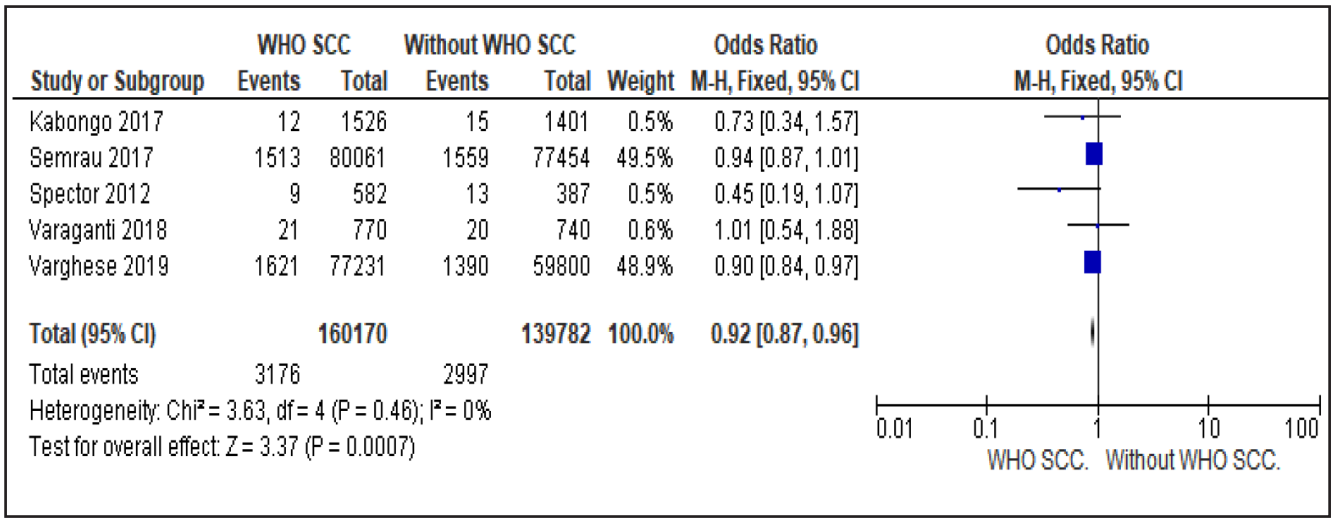


Fig 2: Forest plot of comparison: 1 WHO SCC use and None use., outcome: 1.6 Stillbirth.

### 2. Early neonatal death

There is no statistically significant difference in early neonatal death with or without WHO SCC utilization (OR 1.07,95% 0.01-1.13, I2 =50% five studies, 293,467 participants, very low quality of evidence). Random effect meta-analysis was utilized for this outcome because of heterogeneity (I2= 50%) (Fig 3).

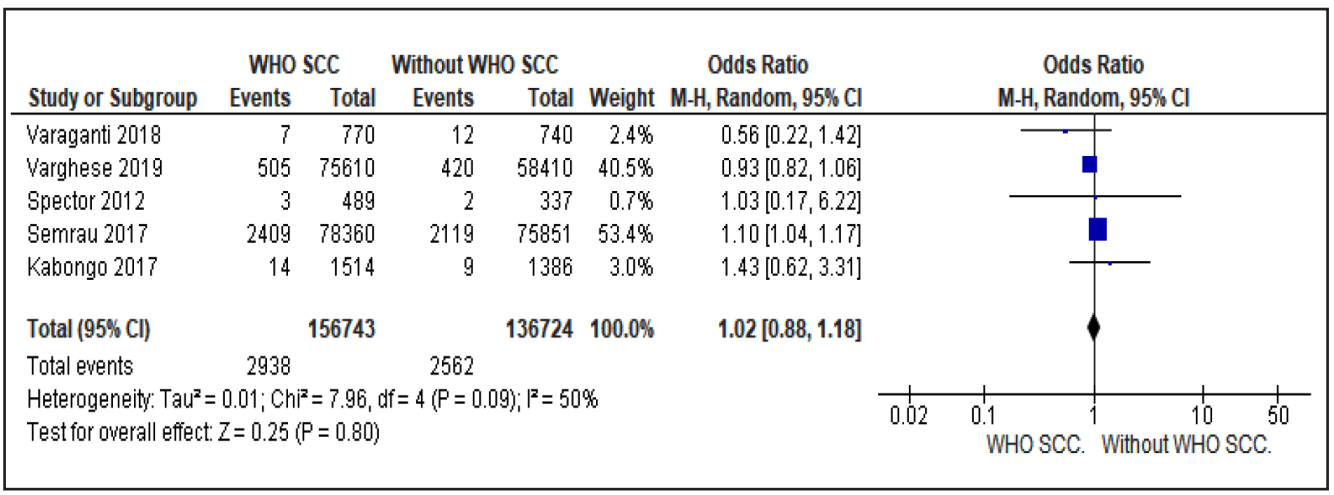


Fig 3: Forest plot of comparison: 1 WHO SCC use and None use., outcome: 1.7 Early neonatal death.

### 3. Maternal death

There is no statistically significant difference in maternal death with or without WHO SCC utilization (OR 1.06,95% 0.77-1.57, I2 =0% three studies, 159,934 participants, low quality of evidence) (Fig 4).

### 4. Maternal morbidity

One study (Semrau et.al 2017 [15]) reported that WHO SCC utilization has no statistical significant impact on maternal seizure (OR 0.93,95% 0.66-1.30), PPH (OR 0.94,95% 0.91-0.98), maternal sepsis (OR 1.02,95% 0.98-1.07), peri partum hysterectomy (OR 1.02,0.54-1.95) and blood transfusion (OR 0.99,0.89-1.11).

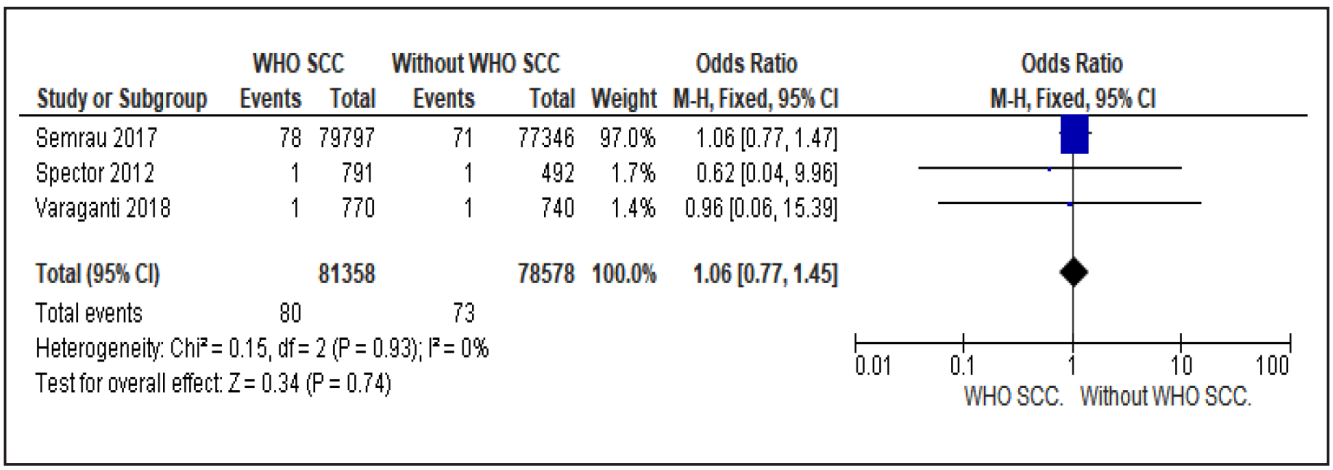


**Fig 4: Forest plot of comparison: 1 WHO SCC use and None use. Outcome: 1.7 Maternal death.**

Methodological quality was assessed for three of the outcomes using the GRADE approach (Shown in table 2 below). The outcome stillbirth was assigned moderate-quality evidence scores. The outcome maternal death was assigned low-quality evidence scores, where-as early neonatal death outcome was assigned very low-quality evidence scores (Table 2).

**Table 2: Summary of Finding (SOF) table**

Summary of Findings (SOF)

WHO SCC compared to Usual care without WHO SCC for laboring mothers and newborn evaluation and management

Patient or population: health professionals, laboring mothers, and newborns.
Setting: sub-district, district, and tertiary health care.
Intervention: WHO SCC
Comparison: Usual care without WHO SCC

| Outcomes | Anticipated absolute effects* (95% CI) The risk with Usual care without WHO SCC | (95% CI) The risk with WHO SCC | Relative effect (studies) | No. of participants evidence(GRADE) | The certainty of the |
|---|---|---|---|---|---|
| Still birth. | 21 per 1,000 | 20 per 1,000 (19 to 21) | OR 0.92 (0.87 to 0.96) | 299952 (5 RCTs) | ⊕⊕⊕◯ MODERATE[a] |
| Early neonatal death | 19 per 1,000 | 20 per 1,000 (19 to 21) | OR 1.07 (1.01 to 1.13). | 293467 (5 RCTs) | ⊕◯◯◯ [c] VERY LOW [a, b,] |
| Maternal death. | 1 per 1,000 | 1 per 1,000 (1 to 1) | OR 1.06 (0.77 to 1.45) | 159936 (3 RCTs) | ⊕⊕◯◯ LOW [c, d] |

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).
CI: Confidence interval; OR: Odds ratio; RR: Risk ratio

GRADE Working Group grades of evidence
High certainty: We are very confident that the actual effect lies close to that of the estimate of the impact
Moderate certainty: We are moderately confident in the effect estimate: The real impact is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low certainty: Our confidence in the effect estimate is limited: The actual impact may be significantly different from the estimate of the effect
Very low certainty: We have very little confidence in the effect estimate: The exact result is likely to be substantially different from the estimate of effect

Explanations
a. Two clusters -randomized, three pre-and-post intervention studies were included. Downgraded one level for risk of bias of included studies.
b. Lowered one level for inconsistent outcomes across studies.
c. Wide and statistically non-significant confidence interval.
d. One cluster-randomized trial and two pre-and -post-intervention studies were included. Downgraded one level for risk of bias of included studies.

## DISCUSSION

This systematic review attempted to locate available evidence on the impact of WHO SCC utilization on maternal and perinatal deaths. Studies included in the review were two cluster randomized trials and three pre-and-post intervention studies. The studies did not undergo proper random allocation and allocation concealment and were judged to be at high risk of bias because of poor design.

Moderate quality of evidence indicates that utilization of WHO SCC by health professionals reduces fresh stillbirth by 8% compared to none use of WHO SCC. Five studies reported on the outcome still birth. Fixed effect metanalysis was employed since the studies were homogenous and consistent.

Low quality of evidence indicates that the utilization of WHO SCC has no impact on maternal death. Only three studies reported on the outcome maternal death and fixed effect metanalysis was used to pull studies together. Further studies are needed as only three primary studies were combined which might not reveal small changes since maternal death is a rare event. Very low quality of evidence indicates that the utilization of WHO SCC has no impact on early neonatal death. Five studies reported on the outcome early neonatal death. We used random effect metanalysis to pull studies together because of moderate heterogeneity of included studies. Besides, moderate heterogeneity with I2 =50%, the primary studies included are of poor-quality mandating further well-designed studies.

Only one randomized cluster study (Semrau et al. 2017 [15]) reported that WHO SCC utilization has no statistically significant impact on maternal seizure, PPH, maternal sepsis, peripartum hysterectomy, and blood transfusion. This mandates further study to provide evidence on the impact of WHO SCC on maternal morbidity reduction. In this review the extent and quality of utilization of the checklist by professionals was not assessed which might be one reason creating difference in effects between early neonatal death and still birth. Additionally, the studies reporting on outcome early neonatal death were heterogenous and of poor quality. However, the review highlights the need to use structed checklist (WHO safe childbirth checklist) for intra-partum follow up of labour and delivery.

## CONCLUSIONS

### Implications for practice

WHO SCC was effective in reducing stillbirth. Moderate quality of evidence indicates that WHO SCC reduce stillbirth, whereas low and very low quality of evidence suggests that WHO SCC has no impact on maternal and early neonatal death, respectively. A lot of things might contribute to perinatal and maternal death. Therefore, it is imperative to contextually modify the checklist (WHO safe childbirth checklist) to address major events contributing to intrapartum maternal death, still birth and early neonatal death.

### Implications for research

Number of included studies were limited and of poor quality. The evidence regarding the effect of utilizing WHO SCC on early neonatal death has moderate heterogeneity and only three studies reported on maternal death. Hence, further well-designed studies with modified checklist are needed to provide evidence on WHO SCC's impact on the maternal and perinatal death.

### List of abbreviations

END: Early Neonatal Death
GRADE: Grading of Recommendations, Assessment, Development, and Evaluation
OR: Odds Ratio
RCT: Randomized Controlled Trials
SCC: Safe Childbirth Checklist
SOF: Summary of Finding
WHO: World Health Organization.

## DECLARATIONS

Ethics approval and consent to participate
Not applicable

### Consent to publish

Not applicable

### Availability of data and materials

The datasets used and/or analysed is contained within the manuscript and available from the corresponding author on reasonable request.

## COMPETING INTERESTS

The authors declare no conflict of interest in this review.

## FUNDING

Authors did not get any funding support from any organization for this systematic review.

## AUTHORS' CONTRIBUTION

All authors have read and approved the manuscript
Conceptualisation : LBT, TU, BN
Data curation : LBT, TU, BN
Formal analyses : LBT, TU, BN
Funding acquisition : NA.
Investigation : LBT, TU, BN
Methodology : LBT, TU, BN
Project administration : LBT, TU, BN
Ressources : LBT, TU, BN
Software : LBT, TU, BN
Supervision : LBT, TU, BN
Validation : LBT, TU, BN

## ACKNOWLEDGMENTS

We are thankful to Saint Paul's Hospital Millennium Medical College centre of excellency for reproductive health (SP HMMC COE) for coordinating training on systematic review.

## CORRESPONDING AUTHOR

**Lemi Belay, MD**
**Department of Obstetrics and Gynecology, St. Paul's Hospital Millennium College**
**Email: lemi.belay@gmail.com**

## REFERENCES

1. Simon JL, Daelmans B, Boschi-Pinto C, Aboubaker S, Were W. Child health guidelines in the era of sustainable development goals. The BMJ. 2018;362 %U https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6081993/.
2. WHO | WHO Safe Childbirth Checklist [updated 2019/08/09/12:21:32. Available from: http://www.who.int/patientsafety/topics/safe-childbirth/childbirth-checklist/en/files/642/en.html.
3. Spector JM, Agrawal P, Kodkany B, Lipsitz S, Lashoher A, Dziekan G, et al. Improving quality of care for maternal and newborn health: prospective pilot study of the WHO safe childbirth checklist program. PloS one. 2012;7(5):e35151.
4. Varaganti N, Sangabathula H, Guthi VR. Effectiveness of safe child birth checklist on maternal and perinatal outcomes in tertiary level hospitals. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2018.
5. Kara N, Firestone R, Kalita T, Gawande AA, Kumar V, Kodkany B, et al. The BetterBirth Program: pursuing effective adoption and sustained use of the WHO Safe Childbirth Checklist through coaching-based implementation in Uttar Pradesh, India. Global Health: Science and Practice. 2017;5(2):232-43.
6. Varghese B, Copas A, Kumari S, Bandyopadhyay S, Sharma J, Saha S, et al. Does the safe childbirth checklist (SCC) program save newborn lives? Evidence from a realistic quasi-experimental study, Rajasthan, India. Maternal health, neonatology and perinatology. 2019;5:3.
7. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Medicine. 2009;6(7 %U https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2707599/).
8. Higgins JP, Green S. Cochrane handbook for systematic reviews of interventions: John Wiley & Sons; 2011.
9. Tufanaru C, Munn Z, Stephenson M, Aromataris E. Fixed or random effects meta-analysis? Common methodological issues in systematic reviews of effectiveness. International journal of evidence-based healthcare. 2015;13(3):196-207.
10. GRADEpro G. GRADEpro guideline development tool [software]. McMaster University. 2015;435.
11. Delaney MM, Maji P, Kalita T, Kara N, Rana D, Kumar K, et al. Improving adherence to essential birth practices using the WHO safe childbirth checklist with peer coaching: experience from 60 public health facilities in Uttar Pradesh, India. Global Health: Science and Practice. 2017;5(2):217-31.
12. Kara N, Firestone R, Kalita T, Gawande AA, Kumar V, Kodkany B, et al. The BetterBirth Program: Pursuing Effective Adoption and Sustained Use of the WHO Safe Childbirth Checklist Through Coaching-Based Implementation in Uttar Pradesh, India. Global health, science and practice. 2017;5(2):232-43.
13. Senanayake HM, Patabendige M. Piloting of WHO Safe Childbirth Checklist using a modified version in Sri Lanka. 2018;11(1):896.
14. Patabendige M, Senanayake H. Implementation of the WHO safe childbirth checklist program at a tertiary care setting in Sri Lanka: a developing country experience. BMC pregnancy and childbirth. 2015;15:12.
15. Semrau KE, Hirschhorn LR, Marx Delaney M, Singh VP, Saurastri R, Sharma N, et al. Outcomes of a coaching-based WHO safe childbirth checklist program in India. New England Journal of Medicine. 2017;377(24):2313-24.
16. Kabongo L, Gass J, Kivondo B, Kara N, Semrau K, Hirschhorn LR. Implementing the WHO Safe Childbirth Checklist: lessons learnt on a quality improvement initiative to improve mother and newborn care at Gobabis District Hospital, Namibia. BMJ open quality. 2017;6(2):e000145.

Supporting information

S1 Table: Search strategy for the MEDLINE database. It indicates a detailed search strategy for PubMed.

S2 Table: PRISMA ch ecklist. It describes the review against the checklist for the PRISMA reporting guideline.

.

# PREMISES AND RATIONALE OF CONTRACEPTIVE SERVICES ACCESSING IN SOUTHERN ETHIOPIA: A PHENOMENOLOGICAL EXPLORATION

Abraham Alano, PhD.[1], Lori Hanson, PhD.[2], Mellese Madda, PhD.[3]

## ABSTRACT

**BACKGROUND:** Despite the encouraging engagements of stakeholders in contraceptives provision in Ethiopia, there was paucity of information on service providers' and users' experiences about the premises for accessing services. Therefore, the study was conducted to explore service providers' and user's lived experiences under which premises the services are being given.

**METHODS:** Interpretative phenomenological qualitative methodology was employed to explore the lived experiences of contraceptive services stakeholders. Data were collected using focus group discussions and key informant interviews. Data were analyzed using an interpretive phenomenological analysis framework including phases of data immersion, transcribing, coding, theme development, and phenomenological interpretation through hermeneutic circle.

**RESULTS:** The study captured enabling context for contraceptive service provision and use from various rationales, organization, and expansion of contraceptive services to the community and households. The findings indicated that contraceptive service provision from the demographic and socio-economic perspectives was understood adequately all in the positional hierarchies, but the human rights-based rationale was less obvious, except for higher level health leaders.

**CONCLUSION:** The study concludes that the bigger picture premise for contraceptive services provision, the human right approach, remained elusive as one moves down the hierarchy in health care organizations. On the other hand, the demographic, economic, and health rationales are more obvious. Hence, the study recommends the disconnect in the broader premises of providing contraceptive services (the human rights approach) must properly be communicated to the lower-level stakeholders.

**KEY WORDS:** Demography, Economy, Human rights, Contraception, Phenomenology, Rationale

(The Ethiopian Journal of Reproductive Health; 2021; 13;38-45)

1 College of Medicine and Health Sciences, School of Public Health, SNNPR Policy Research Institute, Hawassa University, SNNPR, Ethiopia

2 Department of Community Health and Epidemiology, College of Medicine, University of Saskatchewan, Saskatoon, Canada

3 College of Social Sciences, Hawassa University, SNNPR, Ethiopia

## INTRODUCTION

Modern contraceptive services are practiced primarily based on demographic rational[1]. Currently, the program comprises the health and human rights rationale, and practiced in many western countries [1]. The latter is strongly recommended by the WHO [2].

Sexual and reproductive rights are inalienable human rights, inseparable from other basic rights [3]. Sexual and reproductive rights can be defined in terms of power and resources: the power to make informed decisions over one's own fertility, procreation and childcare, and sexual activity, as well as the resources to carry out those decisions safely and effectively [4]. The link between reproductive rights and women's empowerment and the role of contraceptive utilization is obvious [5]. The ability of women to control their sexuality and fertility through proper use of contraceptives is the cornerstone to ensuring other aspects of women's and human rights [6,7].

Although women's rights in relation to contraceptive use have been invoked since the early 1900s, this rationale remained obscure due to lack of public attention. Strong global women's movements rising against the overemphasis of overpopulation on the issue of contraceptive services have made remarkable progress over the past two decades in re-situating contraceptive provision as part of the broader issue of women's rights and desires [8]. These movements assert that any policy and program geared towards contraceptive services provision should consider the social justice and individual rights in all social and economic situations [9-11].

The International Conference on Population Development (ICPD) program stressed that women's empowerment was one of the strategies identified as critical to addressing the population and development problems in achieving the proposed goals [12]. Since the release of the ICPD, the issue of contraceptive provision has recognized women's rights as reproductive rights, and as being included in all reproductive health components [12].

In Ethiopia, a significant amount of research has been conducted in relation to contraceptive use. Some of these studies addressed the benefits of contraceptive use related to demographics and health benefits [9]. There is a dearth of information about the benefits of contraceptive use from the perspectives of human rights/women's rights. The government of Ethiopia has realized the importance of providing family planning from the perspective of human/women's rights and designed a new family planning strategy emphasizing these rights and has incorporated similar considerations in the health extension program. This study was conducted with the aim of investigating the lived experiences of Ethiopian women using contraceptive, as well as service providers and managers about the broad perspectives of providing contraceptive services. It purports that service provision from a human right- based approach would further enhance the accessibility, acceptability, and sustainable use of service to ensure the multidimensional benefits of contraceptive services.

## METHODS

### The Research Context

This study was conducted from September 2013 until May 2014 in three districts of Sidama Zone. Sidama Zone is one of the thirteen zones in the former Southern Nations Nationalities and People's Regional state (SNNPR) of Ethiopia. The Zone is bordered with Oromia Regional state in the southeast, east and north, Gedeo zone in the south and with Wolaita Zone in the west [13].

### Study Design

The study employed an interpretive phenomenological qualitative methodology for understanding the lives of the study participants. It focused on describing the meanings given by the individuals and how these meanings influence the access to the services [14]. The study aims to explore the life experiences of study participants related to the premises of accessing contraceptive services [15].

### Data collection

Focus group discussions (FGDs) and key informant

interviews were used. Three female research assistants with educational and professional experience conducted the interviews and discussions. A purposive sampling method was used to include well-informed participants [16].

A total of 82 women of reproductive age group participated in the focus group discussions. Eighteen key informants were involved in the interview based on the designated position they hold in their respective institution (Additional file 1). Semi-structured interview guides were utilized for the interviews and the discussions. Participants were encouraged to speak up about their experiences through diligent probing [17].

Once participants took their seats, the health extension worker introduced them to the research team. Permission to audiotape and to take notes was secured to document the discussion. The researcher moderated the discussion session and the research assistant translated to the women. Care was taken to involve all participants equally so each could discuss their lived experiences in a session of 60-90 minutes.

All the key informants' interviews were conducted individually in the informant's office. Copies of study support and ethical clearance letters were presented to the informants after establishing rapport. After making sure that the informant had read the letters, the research team asked permission to continue and gave the informant a consent form to read and sign. Once the research team obtained a final signed consent form from the key informant, the interview was conducted.

In accordance with the procedure of the qualitative study and the interpretive phenomenological approach, discussion was carried out thoroughly based on the study guide and opportunities to probe more issues as they emerged. The interviews lasted from 60 to 90 minutes and the research team made sure the entire interview was documented both in the form of an audio recording and notebooks 18.

**Data analysis**

Analysis was done using the guiding principle of interpretive phenomenological analysis (IPA) [19]. An adapted flow diagram from the IPA was used to guide the analysis (Additional file 2). All the audiotaped materials were transcribed verbatim, first in Amharic then translated to English and then back to Amharic by a professional linguist (additional file 3-5). The principal investigator checked for consistency in every step. Key informants were given the chance to comment on summary transcripts. Field notes were organized under the guiding research questions. The principal researcher made several readings on the transcripts to reach data immersion. Margin notes and descriptive coding were then completed for all the materials. Data reduction was done in a stepby-step approach, beginning with the transcripts, followed by descriptive coding, and then distilling this material into themes by bringing similar ideas and concepts together. Themes were identified using side notes and were guided by the research questions. The analysis process made use of the idea of a hermeneutic circle; in brief, the back-and-forth iterative linking of data from both perspectives of the researcher and study participants [19].

Quality assurance or trustworthiness was done in line with the qualitative data quality assurance steps: credibility, transferability, dependability, and conformability [19]. It was carried out by: 1) presenting the summary of transcripts to the study participants to give them an opportunity for further comment; 2) reviewing of the preliminary findings to ensure the early findings reflect what they know and experienced; 3) sharing the preliminary summary findings with the health leaders and service providers to check interpretations.

**RESULT**

The study finding is presented under the respective questions relating to the lived experiences of the health managers, service providers, and service users about the premises of providing contraceptive services in the study environs. Experiences of the study participants about the broad premises of providing contraceptive service as one of the enabling situations for service provision: Our interest was to learn the broad premises on which

the contraceptive service is delivered to clients. Discussions with key informants revealed that contraceptive service is being given to improve the health status of mothers and children and to harmonize the number of children with one's economic capacity. The key informants mentioned the health and economic rationale as the major reason and this can be understood from the following quotes given at the levels of managerial and service provision: One of the goals is improving the health status of mothers which further contributes to the health of the family, community, and the country at large. Ethiopia, as a developing nation, has many sociodevelopmental challenges. For example, the nation has nearly eighty percent of its population live in the rural area where farmland size is depleting over time. This means that the rural land ratio to the population is significantly reduced and thus agricultural productivity remains strained. It is obvious that the district has no means to expand the land size. Some of the challenges are related to unregulated fertility which could have been normalized through providing contraceptive services to our clients (Gurumu, a district manager aged 27). Furthermore, the health and economic rationale/ benefits were well expressed by the women who use services. The study revealed that the livelihood changes of most service users were positive in comparison to pre-contraceptive use period. The following excerpt taken from focus group discussion and supports this claim: From the time I began using contraceptive service, I started to space pregnancy for five years at least. I got adequate time to handle my children properly, breast feed adequately, and grow well. My health status is improved, and I gained strength. I reached to state of deciding when and how to get pregnant in connection to my health and economic status (Dangure, used the service for five years and aged 28).

On the other hand, health managers at higher levels have expressed the human rights rationale for providing contraceptive service. One of the informants at the higher level of health administration expressed this as follows: The main reason for provision of contraceptive service to the citizens in our Country is based on the national constitution which indicates health as the right of the people. The constitution enshrines that every woman has the right to decide on the number and timing of bearing children as she wants. Reproductive rights are basic human rights. Therefore, citizens have the right to get proper knowledge and services related to reproductive health including contraceptive service. The other one is related to the desire of couples to limit or space the number of children they want to have (Markos one of the higher-level leaders aged 32). Furthermore, discussions with key informants clearly reveals that the economic or demographic and health rationale is being given the major emphasis in the provision of services. The informants stated that Ethiopia as a developing country strongly needs to regulate the population growth in relation to its socio-economic status. Similarly, the study area is characterized by such a perspective, with the aforementioned rationales being topmost in the agenda. This idea is further elaborated by one of the key informants and top health managers at the regional level: The demographic rationale of contraceptive service for a nation like ours is mandatory and no negotiation is needed on this matter. This is not only from the global or national perspectives but if you go to the family level, they tell you about it. You can easily observe a family postponing pregnancy for long time even without having one child. When we ask them why, they tell us the challenges they anticipate in up bringing them related to demographic and economic problems.

To demonstrate the progress in respect to socioeconomic dimensions, the country must harmonize the population growth with the economic growth. However, there is a disconnect in the comprehensive understanding regarding contraceptive service provision from the human rights rationale, and this affects the provision of contraceptive services from the premises of the ICPD agreed plan of action and proliferation of the

human rights-based approach. The study revealed that most women did not understand that their challenges are related to issue of human rights. This is demonstrated by the quote from one of the FGD discussants in the following way: We receive the services on our respective appointment dates without any worries and return home to do our work. In the grace of our Lord and due to the commitment of the government, now we are freed from challenges related to mistimed and unplanned pregnancies and their related burdens (Balesse, a 25-year-old woman in the sixth grade).

## DISCUSSION

The study examined the broad premise of contraceptive service access from historical trajectories and current trends. The level of emphasis given to contraceptive service and the underlying rationales differ across the world despite the global consensus [2]. In relation to this, the study examined the rationale governing the contraceptive service provision in the study area.

Service providers and health leaders revealed different experiences about the ultimate rationale for contraceptive service accessing. Health leaders at higher levels clearly internalized the broad premises of providing contraceptive services. Their experiences showed that Ethiopia has endorsed the rights rationale as the backbone for reproductive health service provision.

The leaders expressed that a health issue is a human rights issue [2], to which Ethiopia reveals its commitment. It was enforced by including the health issue as part of human right issue in the constitution. The revised reproductive health strategy of the country confirms that provision of contraceptive services is part of reproductive health under the rights rationale and is a priority of the country. In this case, the experience of higher-level leaders matches with the international consensus. Ensuring reproductive rights through reproductive health service provision supports the attainment of the highest possible level of reproductive outcomes [20].

However, the study has uncovered lack of consistency of the phenomenon, the rationale from the perspectives of lower lever participants including service users. When one goes down to the operational hierarchy, it was easy to hear the demographic, economic, and health rationales automatically, but the issue of the rights rationale was a gray area. District managers emphasized the demographic and economic rationale when considering their district's socio-economic context. They expressed the seriousness of poverty, the everdiminishing land size, and the loss of agricultural productivity as the reason for their emphasis on the demographic and economic rationale. They ardently expressed that the economic and demographic rationale cannot be overlooked [21,22].

The experience of the lower-level health managers and service providers is commensurate to the dominant demographic and economic rationale, despite 20 years of advocacy related to other rationales, the rights-based approach. The study ascertained that health leaders and health service providers strongly emphasized economic and demographic rationales more readily than others. Women's experiences also revealed that the primary purpose for which they are using contraceptive services is related to economic and health issues [23]

The health rationale is another area that health professionals associated with. They expressed their experiences and attitudes in this regard, stating that contraceptive service is lifesaving for both mothers and children. Women's experiences also substantiated this, as their health status has improved due to contraceptives use. The study disclosed women's feeling that the government offers contraceptive services as a measure of goodwill and blessing, but that they do not see the service as an inherent right the government is obligated to provide. This may be due to the long-standing reproductive health and livelihood challenges they had faced and their low level of awareness of rights and privileges to which they are entitled. The perspectives in this study are distant from those of the ICPD declaration and global

agreements that nations have obligation to provide access to reproductive health services, including family planning, to their citizens [4,9].

It can further be argued that the reproductive health rationale (human rights rationale) for providing contraceptive services is not well communicated and that there is inadequate emphasis on the issue. It can be argued that such undertakings affect the rights of women to make decisions regarding their reproductive health. Moreover, the information gap that existed in the health hierarchy demonstrates that the level of understanding towards rights issues is inadequate. This lack of attention to contraceptive use as a right may negatively influence the rapid expansion of services [9]. It can be substantiated that a service that "respects, protects and fulfills" reproductive rights enables sustainable use by reducing the power gaps that exists between the service providers and the women[2].

Whereas contraceptive service has a wide spectrum of benefits, the narrow focus of service only from demographic/economic and health premises limits not only the rapid expansion of service (accessibility & availability), but also the quality and sustainability of service, hence the outcome and impact [2]. If contraceptive provision program is established from a human rights perspective across all the service providing outlets, the service will further ensure rapid attainment of global and national development goals by putting women at the center [2]. The human rights approach offers a broad lens for action by envisioning the changes in political, economic, social, cultural, and individual spheres. Moreover, providing contraceptive services from rights premises fundamentally ensures the notion that a service should respect, protect, and fulfill the human rights [24]

It can be argued that the 'disconnect' between the higher-level leaders and grass root level service providers in utilizing the rights premises is the crucial area that need more attention. The frontline health workers acquaintance with the rights perspective is a key in reaching to husbands and elders [25]. Establishing a notion that contraceptive service provision must consider women as an end but not only as a means is fundamental to ensure the reproductive rights of women 18, 44. The observed disconnect among the service leaders and providers towards human rights premises is a deviation from the international agreement for contraceptive service provision, in which the rights approach is embedded. The WHO guideline clearly stipulates that reproductive services that respect, protect, and fulfill human rights exhibit better health outcomes [2].

**Strengths and limitations**

The limitations of the study may be the inability to include men in the FGD. The delimitation of this study is explained as such that the study was carried out with the intention to explore the experiences of women contraceptive service users, service providers and health managers in the Hawassa University research villages established with the intention to observe the impact of university-based research in knowledge generation, technology transfer, and the livelihood of the residents.

## CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study it can be concluded that despite twenty years of advocacy for the right based approach for reproductive health service provision, the bigger picture and rationale for providing contraceptive services, the human right approach, remained elusive/unclear as one moves down to the hierarchy in health care organizations including the service users.

**Recommendations**

The study recommends the followings for the sustainable contraceptive use:

1. A clear acquaintance to the rights-based reproductive health service delivery approach is needed by the frontline health care workers. Strategy should be designed to train, monitor, and evaluate whether the reproductive services are being given from the human rights perspective.
2. Service users ought to be made aware that it is their right to receive contraceptive services through rights-based education.

3. Deeper questions also remain that deserve consideration. Why has the rights approach to contraceptive service remained obscure?

Other rationales for contraceptive use have been straightforward, translating readily to the practices of service providers; does the lack of uptake and understanding of the rights approach relate to the underlying socio-political context? If so, in what manner?

## ACKNOWLEDGEMENT

We would like to extend our appreciation to the University of Saskatchewan, Canada and Hawassa University, Ethiopia for financial and technical supports. We also appreciate the contributions of study participants, national, regional, and zonal health authorities in the endeavor of this study.

### List of Abbreviation

WHO: World Health Organization; PHC: Primary Health Care; MOH: Ministry of Health; HEP: Health Extension Program; HEW: Health Extension Worker; SNNPRG: South Nation, Nationalities and People's Regional Government; FGD: Focus Group Discussion; IPA: Interpretive Phenomenological Analysis; ICPD: International Conference on Population Development.

## DECLARATION

### Ethical considerations

Ethical clearance was obtained from the University of Saskatchewan Research Ethical Review Board in Canada and Hawassa University Institutional Review Board in Ethiopia. Signed consent forms were obtained from the study participants and participants were assured rights to participate or withdraw from the study. Anonymity of the direct words of the participants is maintained by using the pseudonyms. The quotes from key informants were presented without indicating the identity of the individual. Study participants were informed about communication of the study finding in various meetings, workshops and publications and verbal consents were obtained.

### Availability of Data and Materials

The data for this study is available in the form of transcripts. All the three sources' transcripts are attached as supporting documents.

## FUNDING

The original PhD dissertation was funded by the joint contribution of Hawassa University, Ethiopia and the University of Saskatchewan, Canada. There is no interference of the funding entities in all undertakings of the study.

## COMPETING INTEREST

It was the efforts of all authors primarily dedicated for academic purpose. The financial supports from both universities were in support of a PhD study. Hence, there were no competing interests either from the funding sources or the authors.

## AUTHORS' CONTRIBUTION

AA was responsible for conducting data collection, analysis and the write up. LH was responsible for revising transcription, analysis, editing and supervising all steps. MM was involved in designing the study, manuscript preparation, editing of the manuscript.

## CORRESPONDING AUTHOR

Abraham Alano, PhD.
College of Medicine and Health Sciences, School of Public Health, Hawassa University, Policy Research Institute, SNNPR, Ethiopia
Email: alanoabraham@yahoo.com;

## REFERENCES

1. Robinson, W. C. & Ross, J.A. The global family planning revolution: Three decades of population policies and programs. P.World Bank. Washington, DC; 2007.
2. WHO Ensuring human rights in provision of contraceptive services: guidance and recommendations; 2014.
3. Shalev, C. (2000). Rights to sexual and reproductive health: the ICPD and the convention to eliminate all forms of discrimination against women. Human health human right, 4(2), 38-66.
4. Correa, S. &Petchesky, R. (1994). Reproductive and Sexual Rights: A Feminist perspective, In A. Germain and L. Chen (eds.), Population Policies Reconsidered. Cambridge:Harvard University Press.
5. Bongaarts, J. (2014). The impact of family planning program on unmet need and demand for contraception. Studies in Family Planning 45(2), 247-262.
6. Barroso, C., (2010). The Benefits of Investing in Family Planning: New Evidence and Regional Experiences," presentation to panel discussion sponsored by the Guttmacher Institute, IPPF, New York.
7. Fantahun, M., Berhane, Y., Wall, S., Byass,P. &Hogberg, U. (2006). Women's involvement in household decision-making; -crucial factors for child survival in Ethiopia. ActaPaediatrica, 96(4). DOI. 1111/j.1651-2227.2007.0014.7x.
8. Alexander, A.C., & Wetzel, C. (2011). Empowering women: The role of emancipative beliefs. European Sociology Review, 27(3), 364-384. Doi:10.1039/esr/jcq012
9. Hardee, K., Kumar, J., Newman, K., Bakamjian, L., Harris, S., Rodirguez, M., & Brown, W., (2014). Voluntary, Human Right-Based Family Planning: A Conceptual Framework.
Studies in Family Planning, 2014;45 (1), 1-18.
10. Kaler, A. "Who has told you to do this thing?" Toward a feminist interpretation of contraceptive diffusion in Rhodesia, 1970-1980. Sign,2000; 25(3): 677:708.
11. Dugassa, B.F., (2005). Women's right and health: The case of Oromo women in Ethiopia. Health care women international. 2005; 26: 149-169.
12. Central Statistical Authority of Ethiopia (CSA). Population and housing census. Addis Ababa: 2008.
13. Sidama Zone Health Department. Zonal health profile. (unpublished); 2012.
14. Flood A. (2010) Understanding phenomenology. Nursing research,2010;17(2):7-15.
15. Munhall PL. Nursing research. A qualitative perspective. Fifth edition. Jones &Bartlet Learning. Miam, Filorida. 2012.
16. Patton, M. Q. Qualitative research and evaluation methods(3rd ed.). Thousand Oaks, CA: Sage. 2002.
17. Krueger RA and Casey MA. Focus groups: A practical guide for applied research( 4thEd.). Thousand Oaks, CA: Sage Publications. 2009.
18. Wojnar, D.M. & Swanson, K.M. Phenomenology: an exploration. Journal of holistic nursing, 2007; 25(3), 172-180.
19. Rolfe, G. Validity, trustworthiness and rigour: quality and the idea of qualitative research. Journal of advanced nursing, 2006;53(3), 304-10.
20. UNFPA. The right to choose: reproductive rights and reproductive health, UNFPA, New York. 1997.
21. Degu, G. &Worku, A. Examining perceptions of rapid population growth in north and south Gondar Zones, northwest Ethiopia. Health Population and Nutrition, 2009;27(6), 784- 793.
22. Getahun, C. Population and development in Ethiopia: Investigating the impact of fertility on household economy (emphasis on selected case studies in Amhara National Regional State). Pop Pov Research Network. 2010.
23. Gribble, J., & Voss, M. Family planning and economic well-being: new evidence from Bangladesh. PRB, Policy brief, New York, USA. 2009.
24. Bruce, J. Fundamental elements of the quality of care: a sample framework. Studies in Family Planing,1990; 21(2), 61-91
25. Gulzar, J., Ali, M. &Kuroiwa, C. A social marketing approach to quality improvement in family planning services: a case study from Rawalindi, Pakistan. Biosciences trends, 2008;2 (1), 15-21.

.

# STILLBIRTH AND ASSOCIATED FACTORS AMONG WOMEN DELIVERED IN PUBLIC HOSPITALS, SOUTHWEST ETHIOPIA

Tsegaye Lolaso, MPH[1], Fekede Weldekidan, MPH[2], Tesfaye Abera, MSc.[2], Tilahun Mekonnen, MSc.[2], Lalisa Chewaka, MSc.[2]

## ABSTRACT

**BACKGROUND:** Stillbirth has decreased substantially worldwide in the past 40 years. Yet there is still a large gap in the incidence of stillbirth between developing and developed countries. Data on prevalence and main risk factors for stillbirth are limited in developing countries, including Ethiopia. Identifying the prevalence and risk factors of stillbirth is important for planning maternal and child health care services.

**OBJECTIVE:** To assess the magnitude and associated factors of stillbirth among women delivered at public hospitals in Southwest Ethiopia from February 01 to March 30, 2018.

**METHODS:** A cross-sectional study was conducted on 1,980 delivering women from randomly selected hospitals from February 01 to March 30, 2018. All women who gave birth at public hospitals of Bench-Maji, Kaffa and Sheka Zones during the study period were included. Data was collected by pretested questionnaire in a face to face interview and then entered to Epidata version 3.0 and exported to SPSS version 21 for analysis. Logistic regression analysis was carried out to identify independently associated factors at CI of 95% and significance level of P-value<0.05.

**RESULTS:** The magnitude stillbirth in this study was 99 per 1000 livebirths, 95% CI: 85 to114 per 1000 livebirths. Rural residence [AOR = 2.76 (CI 1.57-4.85)], maternal undernutrition [AOR = 2.99 (CI 1.90-4.72)], had no iron/folate intake during pregnancy [AOR = 8.26 (CI 4.82-14.16)], having delivery complication [AOR = 3.77 (CI 2.31-6.16)], induced labor [AOR = 2.25 (CI 1.26-4.00)] and underweight [AOR = 7.60 (CI 3.73-15.48)] were factors significantly associated with stillbirth.

**CONCLUSION:** In the study area magnitude of stillbirth was found as a public health concern. Residence, nutritional status, iron folate intake during pregnancy, delivery complication, induced labor, and low birth weight were factors significantly associated with stillbirth. This could call for improvement of nutritional status of the mothers; supplementation of iron folate during pregnancy; as well as prevention, early diagnosis and management of obstetric complications.

**KEY WORDS:** Stillbirth, factors, southwest Ethiopia.

(The Ethiopian Journal of Reproductive Health; 2021; 13;46-54)

1 School of Public Health College of Health Science and Medicine Wolaita Sodo University, Wolaita Sodo, Ethiopia

2 College of Health sciences, Mizan Tepi University, Mizan-Aman Southwest Ethiopia

## INTRODUCTION

The World Health oOrganization (WHO) defines stillbirth as a baby born dead at 28 weeks of gestation or more, with a birth weight of ≥1000g, or a baby length of ≥ 35cm [1]. An estimated 2.62 million stillbirths occurred in the world in?? the year 2015 [2]. In sub-Saharan Africa, an estimated 1,060,000 babies die as stillbirths [2]. Ethiopia is fifth of the top ten courtries in the world with the highest stillbirth numbers with stillbirth of 97,000 in 2015 [2].

The worldwide stillbirth rate has declined by 6.3%, from 24.7 stillbirths per 1000 births in 2000 to 18.4 stillbirths per 1000 births in 2015. But in the African region, there was only an annual decline of less than 1.4%. The stillbirth rate for developed countries is estimated between 3.4 and 3.5 per 1000 births, whereas for the developing world, the estimate ranges from 20 to 32 per 1000 births. Two thirds of all stillbirths occur in just two regions; South-East Asia and Africa [2-3]. It is estimated that babies who die before the onset of labor, or ante partum stillbirths, account for two-thirds of all stillbirths in countries where the mortality rate is greater than 22 per 1,000 births [4].

Stillbirth can trigger anxiety as parents attempt to cope with the crisis [5]. Grief can be devastating to the parents; the stillborn infant represents the loss of their future, "the world that should be." Although individual reactions are determined by cultural and religious beliefs, the birth crisis typically causes fear and worry as the family adapts. Sociocultural expectations of grief for varying gestational ages may not be congruent with the parents' experience. Some women have unexpected and profound grief after a first stillbirth [6]. The effects of stillbirth have a burden of funeral cost, loss of work, and resultingunemployment for parents [5].

From previous studies, preterm birth, increasing maternal age, history of stillbirth, reported hypertension, extremes of neonatal birth weight, cesarean delivery, operative vaginal delivery, and assisted breech delivery were all significantly associated with stillbirth [7-9]. Stillbirth is still major public health problem in Ethiopia. In general, epidemiological data on the magnitude and risk factors of stillbirth are important for planning maternal and child health care services in developing countries.

Though there are various studies conducted in low-income countries including Ethiopia [7, 10-12], there is no report about stillbirth and associated factors in the study area. Hence, this study assessed magnitude and associated factors of stillbirth among women delivered at public hospitals in Southwest Ethiopia.

## METHODS AND MATERIALS

### Study design and setting

An institutional based cross-sectional study was conducted in public hospitals found in Bench Maji, Sheka and Bonga zones namely, Mizan Tepi University Teaching Hospital, Tepi General Hospital, Chena Primary Hospital and Gebretsadik Shawo General Hospital from February 01- March 30/2018. The three zones Keffa, Benchi-Maji and Sheka are located 460km, 583km, and 633km far from Addis Ababa respectively [13]. The zones have one referral hospital, two general hospitals, three primary hospitals and 93 health centres. All of these facilities were providing delivery services. The zones has 1853 obstetric care providers

### Sample size and sampling procedure

The sample size was calculated by using a single population proportion sample size calculation formula considering the following parameters. d = margin of error of 2% with 95% significance level, p=proportion expected prevalence of adverse birth outcome are 25% [11] and considering none response rate of 10% it gives as 1980. For the second objective we use different factors to calculate sample size; having low birth weight gives sample size of 855. We took the maximum and the final sample size was 1,980.

Simple random sampling was used to select public hospitals. The total sample size was allocated proportionally to the four selected public hospitals namely, Mizan Tepi University Teaching Hospital, Tepi General Hospital, Chena Primary Hospital and Gebretsadik Shawo General Hospital. Since

the study was based on delivery case flow, the source of population of each hospital was estimated from the past six months (July 2017 to December 2017) delivery report. The sample size allocation for each hospital was based on the total number of deliveries in the past six months prior to the study period. All women who gave birth in the selected hospitals during data collection period were interviewed.

**Inclusion and Exclusion criteria**

All laboring mothers who gave birth in the selected public hospitals were included and those mothers with multiple or twin pregnancy were excluded.

**Data collection method**

Both primary data collection and record review were implemented. The data was collected using pre-tested structured questionnaires in face to face interviews, follow-up from admission to discharge, MUAC(Mid Upper Arm Circumference) measurement using Shakir strip tape, and record review for hemoglobin test result. The questionnaire was developed based on instruments that were applied in different related studies[3, 11-12, 14-15]. Questionnaires were developed in English and translated to Amharic by expert, and translated back to English to see consistency of the question. The questions were grouped and arranged according to the particular objectives that they could address. The data was collected by trained first degree midwives.

**Data quality control**

The instruments were pretested by trained data collectors in Mizan and Sheko health centers among 99 delivering mothers before actual data collection and few modifications were made.

**Operational Definition**

Stillbirth: the birth of an infant that has died in the womb or during intra partum after 28 weeks of gestation.

**Anemia:** The hemoglobin level of a pregnant woman less than 11gm/dl irrespective of her trimester of pregnancy

Mid Upper Arm Circumference (MUAC): Measurement taken from the mothers' left extended & relaxed arm just at the mid-point of the tip of shoulder girdle and elbow using Shakir strip tape; MUAC <21cm(undernourished) and MUAC ≥21cm(normally nourished).

**Baby weight:** The weight of a naked neonate taken right after birth and/or within first hour after home delivery using ordinary baby weight scale; <2500gm (underweight) and ≥2500gm (normal weight).

**Data management and analysis**

Epidata software version 3.1 and Statistical Package for Social Sciences (SPSS) software version 21.0 was used for data entry and analysis. After organizing and cleaning the data, frequencies & percentages were calculated to all variables that were related to the objectives of the study. Variables with P- value of less than 0.25 in bivariate analysis were entered into the multivariable logistic regression analysis to control confounds so that the separate effects of the various factors associated with stillbirth could be assessed. Finally, variables with p-value less than 0.05 in multivariable logistic regression analysis were considered as independently significant association with stillbirth. Odds ratio was used to determine the strength of association with stillbirth.

**Ethical Considerations**

The letter of ethical clearance was obtained from Mizan-Tepi University, College of Health Science, Institutional Health Research Ethics Review Committee (IHRERC). Further permission was obtained from the Medical Directors of the selected health facilities. Confidentiality was maintained by making the data collectors aware not to record any identification information. After explaining the objectives of the study in detail, informed verbal consent was taken from all study participants. Privacy was maintained by using private room and examination screening during interview and follow-up.

## RESULT

Socio-demographic characteristics of the participants

A total of 1,980 women participated in the study, with a response rate of 100%. Mean and standard deviation of the participants was 24.73(±4.82) years. Slightly less than half 905(45.7%) were rural residents/dwellers, and one fourth 505(25.5%) of

the study participants were unable to read and write. Almost all, 1,911,(96.5%) were married and more than three fourths 1,562(78.9%) were housewives in occupation (Table 1).

**Obstetric characteristics of the participants**

Regarding the intention of the pregnancies, almost all (1,888 or95.4%) of the pregnancies were intended. The majority (1826 or 92.2%) of

**Table. 1. Socio-demographic characteristics of respondents in public hospitals of Benchi-Maji, Kaffa and Sheka zones, 2018.**

| Variables | Category | Frequency | Percent (%) |
|---|---|---|---|
| **Age** | 15-19 | 178 | 9 |
| | 20-24 | 854 | 43.1 |
| | 25-29 | 585 | 29.5 |
| | 30-34 | 230 | 11.6 |
| | 35+ | 133 | 6.7 |
| **Residence** | Rural | 905 | 45.7 |
| | Urban | 1075 | 54.3 |
| **Educational status** | Unable to read and write | 505 | 25.5 |
| | Able to read write(without formal education) | 413 | 20.9 |
| | Primary education | 643 | 32.5 |
| | Secondary education | 263 | 13.3 |
| | College and above | 156 | 7.9 |
| **Marital status** | Married | 1911 | 96.5 |
| | Single | 40 | 2 |
| | Divorced | 7 | 0.4 |
| | Widowed | 10 | 0.5 |
| | Separate | 12 | 0.6 |
| **Religion** | Orthodox | 897 | 45.3 |
| | Muslim | 404 | 20.4 |
| | Protestant | 679 | 34.3 |
| **Occupation** | Housewife | 1562 | 78.9 |
| | Merchant | 177 | 8.9 |
| | Gov't employee | 126 | 6.4 |
| | Non-gov't employee | 22 | 1.1 |
| | Daily labor | 93 | 4.7 |

the participants had ANC follow-up and also the majority 1664(84%) took iron folate during the pregnancy. Regarding complications, 266 (13.4%) and 385 (19.4%) developed complication during pregnancy and delivery respectively. About one fifth 378 (19.1%) of the participants were anemic. 546 (27.6%) of the participants were undernourished and 148 (7.5%) of the newborns has low birth weight (Table 2).

**Magnitude of stillbirth**

The magnitude of stillbirth in this study was 99 per 1000 livebirths, (95% CI 85-114 per 1000 livebirths).

**Factors associated with stillbirth**

Twenty four variables were included in bivariate analysis and thirteen of them were included in the final model. Rural residence, undernutrition, no iron/folate intake during pregnancy, having delivery complication, induced labor, and being underweight were factors significantly associated with stillbirth.

**Table. 2 Obstetric and nutritional characteristics of respondents in public hospitals of Benchi-Maji, Kaffa and Sheka zones, 2018.**

| Variables | Category | Frequency | Percent (%) |
|---|---|---|---|
| **Pregnancy status** | Intended | 1888 | 95.4 |
| | Unintended | 92 | 4.6 |
| **ANC follow-up** | Yes | 1826 | 92.2 |
| | No | 154 | 7.8 |
| **Iron folate intake** | Yes | 1664 | 84 |
| | No | 316 | 16 |
| **Complication during current pregnancy** | Yes | 266 | 13.4 |
| | No | 1714 | 86.6 |
| **Hypertensive disorders of pregnancy** | Yes | 90 | 33.8 |
| | No | 176 | 66.2 |
| **APH** | Yes | 54 | 20.3 |
| | No | 212 | 79.7 |
| **Gestational age** | <37weeks | 182 | 9.2 |
| | ≥37 | 1798 | 90.8 |
| **Complication during current labor** | Yes | 385 | 19.4 |
| | No | 1595 | 80.6 |
| **Status of current labor** | Spontaneous | 1737 | 87.7 |
| | Induced | 243 | 12.3 |
| **Alive birth** | Yes | 1801 | 91 |
| | No | 179 | 9 |
| **Birth weight** | <2500gm | 148 | 7.5 |
| | ≥2500gm | 1832 | 92.5 |
| **Anemia(using Hgb)** | Yes | 378 | 19.1 |
| | No | 1602 | 80.9 |
| **Nutritional status(using MUAC)** | Under nutrition | 546 | 27.6 |
| | Normal | 1434 | 72.4 |

Mothers from rural residence were three times more likely to face stillbirth as compared to their counterpart in urban areas [AOR 2.76, 95% CI (1.57-4.85)]. Mothers who did not take iron folate during pregnancy were eight times more likely to have stillbirth as compared to their counterpart [AOR 8.26, 95% CI (4.82-14.16)]. Mothers those whose MUAC was <21cm (undernourished) were three times more likely to have stillbirth as compared to those whose MUAC ≥21cm (normally nourished) [AOR 2.99, 95% CI (1.9-4.72)]. Mothers who developed complication during delivery were four times more likely to have stillbirth as compared to their counterpart [AOR 3.77, 95% CI (2.31-6.16)]. Mothers whose labor was induced were two times more likely to have stillbirth compared to spontaneous labor [AOR 2.25, 95% CI (1.26-4.)]. Mothers who had an underweight neonate were seven times more likely to have stillbirth as compared to mothers who had neonates of normal weight [AOR 7.60, 95% CI (3.73-15.48)] (Table 3).

**Table. 3 Factors associated with stillbirth among deliveries in public hospitals of Benchi-Maji, Kaffa and Sheka zones, 2018.**

| Variable | Category | Stillbirth | | COR (95% CI) | AOR (95% CI) |
|---|---|---|---|---|---|
| | | Yes | No | | |
| Residence | Rural | 138 | 767 | 4.54(3.16-6.51) | 2.76(1.57-4.85)* |
| | Urban | 41 | 1034 | 1 | |
| Educational status | Cannot write and read | 77 | 428 | 4.25(2.47-7.32) | 0.48(0.22-1.06) |
| | Read and write(without formal education) | 37 | 376 | 2.33(1.29-4.20) | 0.73(0.34-1.55) |
| | Primary education | 48 | 595 | 1.91(1.08-3.37) | 0.56(0.27-1.15) |
| | Secondary school and above | 17 | 402 | 1 | |
| Pregnancy status | Intended | 160 | 1728 | 1 | |
| | Unintended | 19 | 73 | 2.81(1.65-4.78) | 1.58(0.72-3.46) |
| ANC follow up | Yes | 115 | 1711 | 1 | 1 |
| | No | 64 | 90 | 10.58(7.29-15.35) | 1.61(0.84-3.07) |
| In take Iron folate | Yes | 59 | 1605 | 1 | |
| | No | 120 | 196 | 16.66(11.79-23.52) | 8.26(4.82-14.16)* |
| Current pregnancy complications | Yes | 61 | 205 | 1 | 1 |
| | No | 118 | 1596 | 4.03(2.86-5.66) | 1.76(0.96-3.22) |
| Current delivery complication | Yes | 113 | 1482 | 2.71(1.96-3.76) | 3.77(2.31-6.16)* |
| | No | 66 | 319 | 1 | 1 |
| Status of current labour | Spontaneous | 135 | 1602 | 1 | 1 |
| | Induced | 45 | 198 | 2.64(1.82-3.82) | 2.25(1.26-4.00)* |
| Nutritional status (using MUAC) | Normal (MUAC <21cm) | 69 | 1365 | 1 | 1 |
| | Under nutrition (MUAC ≥21cm) | 110 | 436 | 4.99(3.63-6.87) | 2.99 (1.90-4.72)* |
| Anemia (using HGB) | Yes | 76 | 302 | 1 | 1 |
| | No | 103 | 1499 | 3.66(2.66-505) | 1.08(0.645-1.83) |
| Status of birth weight | Normal | 92 | 1740 | 1 | 1 |
| | Under weight | 87 | 61 | 26.97-18.29-39-79) | 7.60 (3.73-15.48)* |
| Gestational age | 37 and above weeks | 94 | 1704 | 1 | |
| | Less than 37 weeks | 85 | 97 | 15.89(11.11-22.72) | 1.69(0.85-3.36) |

AOR= Adjusted Odd Ratio; CI= Confidence Interval, COR= Crude Odd Ratio; *=p-value <0.05

## DISCUSSION

The magnitude of stillbirth was found to be 99 per 1000 livebirths (95% CI: 85-114 per 1000 livebirths). Moreover; rural residence, undernutrition, no iron/folate intake during pregnancy, having delivery complication, induced labor, and being underweight were factors significantly associated with stillbirth.

The findings of this study are consistent with the study done in Hosana which found 8.6 % of births per 1000 were stillbirths. [11]. In this study the magnitude of still birth is higher than the study done in Tanzania (2.7%) [14], Gondar University Hospital in Ethiopia (7.1%) [12], and Ghana (2.22) [10]. The discrepancy might be due study area difference, care provider competency, or the technology available in health facilities, and topography and infrastructure of the study. And also Additionally, health seeking behavior of pregnant mother in the study area might be not similar with mothers in Tanzania and Gondar. Additional studies are required to analyze the reasons for the differeing results.

In this study residence is significantly associated with stillbirth. Mothers whose who are rural residents were more likely to have stillbirth. This finding is congruent with study from Ethiopia [16]. Similarly, mothers who did not take iron folate during pregnancy were more likely to have stillbirth. This could be due to the fact that iron folate improves the level of anemia and anemia is one of the causes of stillbirth [16].

This study revealed that complication during delivery was significantly associated with stillbirth. Mothers who developed delivery complication were more likely to have a stillbirth. This finding is consistent with studies conducted in Zambia, Southern Ethiopia, and Gondar Ethiopia [7, 12, 17]. Maternal undernutrition is significantly associated with stillbirth. Undernourished mothers were more likely to have stillbirth. This may be due to the fact that maternal undernutrition can cause intrauterine growth retardation and result in low birth weight, and finally can result in stillbirth. This finding is in agreement with studies from Tanzania, Hosanna and Kembata Tembaro zone Ethiopia [11, 14, 17].

This study also revealed that induced labor was a risk factor for stillbirth. Mothers whose labor was induced were two times more likely to develop stillbirth as compared to their counterparts. This may be due to the fact that induction can result in tetanic contraction and finally result in fetal distress. Similarly, low birth weight is significantly associated with stillbirth. Neonates with low birth weight were more likely to be stillborn. This findings also consistent with studies conducted in Ghana, Zambia, Tanzania, Gondar, and Hossaina [7, 10-12, 14].

## CONCLUSION

The magnitude of stillbirth in the study area was found to be higher than comparable regions. Residence, nutritional status, iron folate intake during pregnancy, delivery complication, induced labor and low birth weight were factors significantly associated with stillbirth. This could call for improvement of nutritional status of the mothers; supplementation of iron folate during pregnancy; in addition to prevention, early diagnosis, and management of obstetric complications.

## DATA AVILABILITY

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest in any aspect of the article.


## FUNDING STATEMENT

The study was funded by Mizan Tepi University.


## AUTHOR'S CONTRIBUTION

TL- The principal investigator designed the study, collected, analyzed and interpreted the data, and also drafted the manuscript. FW, TA, TM and LC - Participated in conceptualization of the study, design, analyses and interpretation of results as well as drafting and review of the manuscript. All authors read and approved the final manuscript.

**ACKNOWLEDGEMENT**

We are thankful for Mizan Tepi University for funding the study. Our gratitude also goes to data collectors, supervisors and study participants.

**CORRESPONDING AUTHOR**

Tsegaye Lolaso, MPH
School of Public Health College of Health Science and Medicine, Wolaita Sodo University, Wolaita Sodo, Ethiopia
Email address: tlolaso71@gmail.com

## REFERENCES

1. WHO. (2015). "Stillbirths." september 04, 2019. from http://www.who.int/maternal_child_adolescent/epidemiology/stillbirth/en.
2. Blencowe, H., Cousens, S., Cousens, S., Jassir, B. F., Say, L., Chou, D., Mthers, C., Hogan, D., Sheika, S., Quresh, S., You, D., and Lawn, J. E. (2016). "National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analy sis." Lancet Glob Health 4: e98–108.
3. Lawn, J. E., Davidge, R., Paul, K. V., Xylander, V. S., Johnson, G. J., Costello, A., Kinney, V. M., Segre, J., and Molyneux, L. (2013). "Born Too Soon: Care for the preterm baby." Reproductive Health 10(Suppl 1:S5).
4. Graft-Johnson, J.., Kerber, K., Tinker, A., Otchere, S., Narayanan, I., Shoo, R., Oluwole, D., and Lawn, J. (2011). Opportunities for Africa's Newborns Practical data, policy and programmatic support for newborn care in Africa. The maternal, newborn, and child health continuum of care.
5. Heazell, A. E. P., Siassakos, D., Blencowe, H., Burden, C., Bhutta, A. Z., Cacciatore, J., Dang, N., Das, J., Flenady, V., Gold, J. K., Mensah, K. O., Millum, J., Nuzum, D., Donoghue, D. K., Redshaw, M., Rizwi, A., Roberts, T., Saraki, T. H. E., Stoney, C., Wo jcieszek, M. A., and Downe, S. (2016). "Stillbirths: economic and psychosocial consequences." Lancet 387: 604-616.
6. Dinter, M. C. V. and GRAVES L. (2012). "Managing Adverse Birth Outcomes: Helping Parents and Families Cope." American Family Physician 85(9): 900-904.
7. Stringer, E. M., Vwalika, B., Killam, P. W., Giganti, J. M., Mbewe, R., Chi, H. B., Rouse, D., Goldenberg, L. R., and Stringer, A. S. J. (2011). "Determinants of Stillbirth in Zambia." Obstetrics & Gynecology 117 (5 ).
8. McClure, E. M. and Goldenberg R. L. (2014). "Stillbirth in Developing Countries: A review of causes, risk factors and prevention strat egies." Journal of Maternal-Fetal and Neonatal Medicine 22(3): 183-190.
9. Zhu, J., Liang, J., Mu, Y., Li, X., Guo, S., Scherphier, R., Wang, Y., Dai, L., Liu, Z., Li, M., He, C., Deng, C., Yi, L., Li, Q., Dang, K., Ma, X., Wen, C., Mu, D., and Ronsmans, D. (2016). "Sociodemographic and obstetric characteristics of stillbirths in China: a census of nearly 4 million health facility births between 2012 and 2014." Lancet Global Health ; : 4: e109-118.
10. Alhassan, A.,. Ayikai, L. A., Alidu, H., and Yakog, V.N. (2016). "Stillbirths and associated factors in a peri-urban District in Ghana " Journal of Medical and Biomedical Sciences 5(1): 23-31.
11. Abdo, R., Endalemaw, T., and Tesso, F. (2016). "Prevalence and associated Factors of Adverse Birth Outcomes among Women At tended Maternity Ward at Negest Elene Mohammed Memorial General Hospital in Hosanna Town, SNNPR, Ethiopia." Journal of Womens Health Care 5(4).
12. Adane, A., Ayele, T., Zeleke, B., Ararsa, L., and Bitew, B. (2014). "Adverse birth outcomes among deliveries at Gondar University Hos pital, Northwest Ethiopia." BMC Pregnancy and Childbirth 14(90).
13. CSA & UNFPA. (2012). "2007 Population and Housing Census of Ethiopia." November, 23/2019. Fromhttps://www.google.com/search?q=2007+population+and+housing+census+of+ethiopia&oq=2007+POPULATION+and+HOUSING+CENSUS+OF+ETHIOPIA&aqs=chrome.0.0l4.2216j0j1&sourceid=chrome&ie=UTF-8.
14. Watson-Jones, D., Weiss, H. A., Changalucha, M. J., Todds, J., Gumodoka, B., Bulmer, J., Balira, R., Ross, D., Mugeye, K., Hayes, R., and Mabey, D. (2007). "Adverse birth outcomes in United Republic of Tanzania impact and prevention of maternal risk factors." Bul letin of the World Health Organization 85(1): 9-18.
15. Zenebe, K., Awoke, T., and Birhan, N. (2014). "Low Birth Weight & Associated Factors Among Newborns in Gondar Town, North West Ethiopia: Institutional Based CrossSectional Study " Indo Global Journal of Pharmaceutical Sciences 4(2): 74-80.
16. Berhie, K. and Gebresilassie, H. (2016). "Logistic regression analysis on the determinants of stillbirth in Ethiopia" maternal Health, Neonatology, and Perinatology, 2:1 DOI 10.1186/s40748-016-0038-5.
17. Lolaso, T., Oljira, L., Dessie, Y., Gebremedhin, M., and Wakgari, N. (2019). "Adverse birth outcome and associated factors among newborns delivered in Public Health Institutions, southern ethiopia" East African Journal of Health and Biomedical Sciences, Volume 3(2): 35-44.

# DICEPHALUS PARAPAGUS TRIBRACHIUS DIPUS CONJOINED TWINS: A CASE REPORT

MandefroYilma Asfaw, MD[1], Workiye Menber Molla, MD[1]

## ABSTRACT

Dicephalus parapagustribrachius dipus conjoined twins are a very rare phenomenon. We present a case of stillborn dicephalus parapagustribrachius dipus female conjoined twins. The twins were delivered after nine months of amenorrhea by cesarean section for labor abnormality at second stage of labor. It is supposed that with proper early diagnosis, this case should be better if terminated at first or second trimester of pregnancy.

**KEY WORDS:** Dicephalus parapagustribrachius dipus; conjoined twins; stillborn

(The Ethiopian Journal of Reproductive Health; 2021; 13;55-58)

1 Department of Obstetrics and Gynecology,Wollo University, Dessie, Ethiopia

## INTRODUCTION

Conjoined twins are rare complication of monozygotic twinning [1].They occur 1 in 50,000 to 1 in 100,000 live births [1,2] and 1 in every 200 identical twins [3]. Females in conjoined twins predominate at the ratio of 3:1 and 75% die within the first 24 hours [1,4, 5]. Conjoined twins is a condition believed to be caused by either delayed splitting of fertilized ovum (after 13 days of ovulation) or incomplete division of the developing embryo[6]. This event gives rise to mono-chorionic monoamniotic placentation with conjoined fetuses [1].

## CASE REPORT

A 34 year-old gravid V, para III (all alive), abortion I (spontaneous) woman was referred from a local health center to our hospital (Dessie Referral Hospital) with the diagnosis of prolonged second stage of labor after vacuum delivery was attempted for better management. The fetal heart rate was negative as reported on the referral paper. She had ultrasound scanning for the first time at the gestational age of four and a half month, which was found to be a suspected conjoined twins. For this reason she was referred to a senior radiologist and was diagnosed with dichorionic diamniotic twins. She started to have labor after uneventful pregnancy course. There was no self or family history of twinning.

On physical examination, her vital signs were within normal range. She had contractions and one head was already delivered with chignon mark over the right occipito-parietal region. There was right medio-lateral episiotomy.

Ultrasound done at the hospital showed one head within the uterine cavity, only one cardiac shadow and one trunk was seen. The fetal heart beat was negative, placenta was fundal, and gestational age by femoral length was 38 weeks and 5 days.

After informed written consent was obtained, lower uterine segment transverse cesarean section was made to effect the delivery of 4800 grams freshly dead female conjoined twins by reverse breech extraction and a third assistant push the delivered head back to the uterus. The extraction of the heads were somewhat difficult, extracted turn by turn, without any complications. The babies had one trunk, two well-formed upper limbs, a rudimentary arm in between two heads and necks and two lower extremities. There was a single placenta and umbilical cord. The cord had single umbilical artery and one umbilical vein. (Figure 1 & 2) Episiotomy was repaired.

**Figure 1.Conjoined twins with two heads, two well-formed upper limbs and single rudimentary arm and shared trunk.**

**Figure 2.Conjoined twins with two heads, two well-formed upper limbs and single rudimentary arm and shared trunk, a pair of lower limbs, female genitalia and a single umbilical cord.**

## DISCUSSION

Four days after fertilization the trophoblast differentiates. If the split occurs before 8th days, the monozygotic twins will have separate amnions and there is no direct contact between fetuses. If the split occur after 8th day and before 13th day, the twins will share of their chorion and amnion. If the embryonic disk starts to differentiate after day 13, then the twins will share body parts in addition to sharing their chorion and amnion [7, 8].

Conjoined twins are classified according to the union's site, with the suffix pagus, meaning fixed. Thorax(thoracopagus), abdomen (omphalopagus), sacrum(pyopagus), pelvis(ischiopagus), skull (cephalopagus), and back(rachipagus) [9,10]. It can be further classified by the number of limbs present: two arms (dibrachius), three arms (tribrachius), four arms (tetrabrachius), two legs (bipus), three legs (tripus) and four legs (tetrapus) [8,9]. Parapagus is a term used where there is extensive side to side fusion [8].

Dicephalus parapagus tribrachius dipus conjoined twins are rare variants of conjoined twins. It is asymmetric or parasitic form of twining where one twin is a potential survivor and usually appears normal while the other is incomplete and attached as a parasite. They are usually stillborn or die immediately after birth, but some have lived for a number of years [5, 6]. In this case report, the twins were stillborn.

## CONCLUSION

Conjoined twins should be suspected in all monochorionic, monoamniotic twin pregnancies and careful early ultrasound assessment with an experienced hand should be performed to rule out the presence of union site between fetuses. If conjoined twins are diagnosed earlier, the parents can be counseled for options of management including termination of pregnancy.

## ACKNOWLEDGMENTS

The authors appreciate the contribution of the resident doctors and operation theatre staffs of Dessie Referral Hospital in the management of this patient.

## DECLARATION

Conflict of interest statement

The authors declare that there is no conflict of interest.

**Funding**

The authors didn't receive any funding to conduct this case report.

**Ethical approval**

No ethical approval was needed.

**Consent**

Informed written consent was obtained from the woman.

## CORRESPONDING AUTHOR

Mandefro Yilma, MD
Department of Obstetrics &Gynecology
Wollo University,Dessie,Ethiopia
Email:ymande23@gmail.com

## REFERENCES

1. Gabbe SG, Niebyl JR, Simpson JL, Landon MB, Galan HL, Jauniaux ER, Driscoll DA, Berghella V, Grobman WA. Obstetrics: normal and problem pregnancies e-book. Elsevier Health Sciences; 2016 Mar 18.
2. Kaveh M, Kamrani K, Naseri M, Danaeian M, Asadi F, Davari-Tanha F. Dicephalic parapagustribrachius conjoined twins in a triplet pregnancy: a case report. Journal of family & reproductive health. 2014 Jun;8(2):83.
3. Osmanağaoğlu MA, Aran T, Güven S, Kart C, Özdemir Ö, Bozkaya H. Thoracopagus conjoined twins: a case report. ISRN Obstetrics and Gynecology. 2011;2011.
4. Swar MO, Khawaga MA, Altahir SA. Dicephalus tribrachius conjoined twins: A case report and review of literature. Sudan J Pediatrics 2011; 11(2):50-53.
5. Edmonds LD, Layde PM. Conjoined twins in the United States, 1970–1977. Teratology 1982; 25:301–8
6. Byers CD, Young JR, Connell M. Parapagus dicephalus dibrachius dipus conjoined twin case. Applied Radiology. 2018 May 1;47(5):29-32.
7. Ibinaiye PO, Mshelbwala PM, Abdulgafar N, Lawal AK. Dicephalus dipus tetrabrachius conjoined twins of Zaria: Case report and literature review. Nigerian Journal of Clinical Practice. 2013;16(3):395-7.
8. Sahu SK, Choudhury PR, Saikia M, Das TK, Talukdar KL, Bayan H. Parapagus Dicephalus Tribrachus Tripus Conjoined Twin: A Case Report. International Journal of Scientific Study. 2015 Feb 1; 2(11):211-3.
9. Mondal M, Biswas B, Mandal P. Dicephalus, tetrabrachius, dipus conjoined twins. Journal of Mahatma Gandhi Institute of Medical Sciences. 2015 Jul 1;20(2):196-197.
10. Aparna C, Renuka IV, Sailabala G, Nayudamma Y. Dicephalus dipus tribrachius: A case report of unusual conjoined twins. Indian journal of Pathology and Microbiology. 2010 Oct 1;53(4):814.

.

# INSTRUCTION TO AUTHORS

**1. Type of Articles**

The Ethiopian Journal of Reproductive Health (EJRH) publishes original articles, review articles, short reports, program briefs, and commentaries on reproductive health issues in Ethiopia, and the African region. EJRH aims at creating a forum for the reproductive health community to disseminate best practices, and relevant information on reproductive health.

**Original Articles:** Articles reporting on original research using quantitative and/or qualitative studies could be submitted to EJRH.

**Review Articles:** Review articles on all aspects of reproductive health issues could be considered for publication in the EJRH.

**Commentaries:** Commentaries on any aspects of reproductive health in Ethiopia or the African region will be considered for publication in the EJRH.

**Program Briefs:** A one or two pages of description of a program run by governmental or non-governmental organizations could be submitted for publication. These briefs should give short summaries about the objectives, strategies for implementation, and expected outputs of programs that are executed by different organizations.

**Short Reports:** Preliminary research findings or interesting case studies could be presented in a summarized form to the journal.

**2. Uniform Requirements**

In order to fulfill uniform requirements for the journal, the following instructions have to be followed by authors: The manuscript should be a total of 3000 to 4000 words. Manuscript layout: Manuscripts should be written in English and typed double-spaced leaving generous margins. Pages should be consecutively numbered. The body of the manuscript should be organized under appropriate headings and sub-headings such as introduction, methods, results, discussion, acknowledgements, and references.

**Title page:** The title page should have title of the article; name of each author and institutional affiliation, and address of the corresponding author.

**Abstracts:** It should not be more than 250 words. It should summarize the background, objective, methods, major findings and conclusions.

**Tables and Figures:** All tables and figures should be submitted on separate sheets of paper and be clearly labeled in the order of their citation in the text. A reader should be able to read only the tables and easily understand all information without reading the text.
References: References have to be numbered consecutively in the order in which they are first mentioned in the text. References must also follow the Vancouver system.

EJRH

Visit us at www.ejrh.org

ISSN: 2520-0275 (Print)
ISSN: 2520-0283 (Online)