DETERMINANTS OF INSTITUTIONAL DELIVERY SERVICE UTILIZATION IN ETHIOPIA: A SYSTEMATIC REVIEW

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Jimma, Ethiopia

FACTORS ASSOCIATED WITH INSTITUTIONAL DELIVERY SERVICE UTILIZATION IN ETHIOPIA: A SYSTEMATIC REVIEW

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ABSTRACT

Background: *Most obstetric complications occur unpredictably during the time of delivery, but can be prevented with proper medical care in the health facilities. Despite the Ethiopian government's efforts to expand health service facilities and promote health institution based delivery service in the country, an estimated 85% of births still take place at home.*
Objective: *The review was conducted with the aim of generating the best evidence on the determinants of institutional delivery service utilization in Ethiopia.*

Methods: *Both published journals and unpublished grey literatures from 2000 to 2014 were retrieved. The reviewed studies were accessed through electronic web based search strategy from PUBMED, HINARI, Medley reference manager, Cochrane Library for systematic reviews and Google Scholar. Review Manager V5.3 Software was used for meta-analysis. Mantel-Hansel Odds ratios and their 95% confidence intervals were calculated. Heterogeneity of the study was assessed using* I^2*test.*

Results: *From 202 retrieved studies, only 34 studies fulfilled the preset criteria and included for the Meta analysis. Living in urban areas (OR = 13.16), primary and above educational level of the mother and husband (OR = 4.95) and (OR = 4.43) respectively, ANC visit (OR = 5.11), visiting ANC as recommended (OR = 3.24), parity one women (OR = 3.05), encountered problems during pregnancy (OR = 2.83) and distance less than 5km from nearby health facility (OR = 2.6) showed significant association with institutional delivery service utilization. Women's autonomy was not significantly associated with institutional delivery service utilization.*
Conclusion and Recommendation: *Residence setting, educational attainment, Parity, Antenatal care visit, frequency of Antenatal care visit, Distance to health facility and problems during pregnancy were factors positively and significantly associated with institutional delivery service utilization. Promoting couples education beyond primary, health education regarding the danger signs of pregnancy and benefit of institutional delivery through available communication networks such as health development army for uneducated and rural mother and Promotion of antenatal care visits and the completion of four standard visits by pregnant women were recommended*

Key words: *systematic review, Ethiopia, institutional delivery, predictors, associated factors*

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Acronyms and Abbreviations

ANC	Antenatal Care
EDHS	Ethiopia Demographic and Health Survey
FMOH	Federal Ministry of Health
HDSS	Health and Demographic Surveillance System
ICPD	International Conference on Population Development
JBI	Joanna Briggs Institute
LMICs	Low and Middle Income Countries
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MOE	Ministry of Education
NGOs	Non-Governmental organization
ORHB	Oromia Regional Health Bureau
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Utilization of essential obstetric care services including but not limited to antenatal care, skilled attendance at birth and postnatal care contribute to the reduction of maternal and neonatal mortality and morbidity in LMICs (1,2). An estimated up to 75% or more of maternal deaths could be averted if all women had access to the interventions for preventing or treating pregnancy and birth complications, in particular emergency obstetric care (3). Institutional delivery service utilization is one of the key and proven interventions to reduce maternal death. It ensures safe birth, reduce both actual and potential complications and maternal death and increase the survival of most mothers and newborns (4).

In spite of the national and global efforts at reducing maternal morbidity and mortality through the safe motherhood initiative, there is no significant reduction in maternal morbidity and mortality in developing countries (5). Maternal mortality remains a major challenge to health systems worldwide and improving maternal health has been on the global health agenda for many years (6). Every day about 800 women die from pregnancy or childbirth related complications around the world. Nearly 75% of all maternal complications that account for deaths are from direct obstetric complication (7). Direct maternal deaths are those resulting from obstetric complications of the pregnant state, including hemorrhage, infection, Eclampsia, obstructed labour and unsafe abortion. whereas indirect maternal deaths are those resulting from previously existing diseases, or from diseases that developed during pregnancy and that were not due to direct obstetric causes but aggravated by physiological effects of pregnancy (8).

Most obstetric complications occur during the time of delivery and cannot be predicted, but can be prevented with proper medical care, as the health-care solutions to prevent or manage complications are well known (7,9). Despite proven interventions that could prevent death or disability during pregnancy and childbirth, maternal mortality remains a major burden in many developing countries. The maternal mortality disparity between developing and developed countries is very high. The maternal mortality ratio in developing regions is 230 death per 100,000 live birth which is 14 times higher than in the developed region (7,9,10). Maternal mortality

continues to be a major challenge in Africa (10). Sub Saharan African countries have the highest MMR in the world with 510 maternal deaths per 100,000 live births and accounting for more than half (62%) of the world's total maternal death (8–10). The adult lifetime risk of maternal mortality in women from sub-Saharan Africa was the highest at 1 in 38 (8).

Ethiopia is one of Sub Saharan country and accounts 420 maternal deaths per 100 000 live births and have estimated 13000 maternal death (4,7). Maternal deaths in Ethiopia represent 30% of all deaths to women age 15–49, in 2011 as compared to 21% and 25% in 2005 and 2000 EDHS respectively (11–13). Evidences show that skilled care before, during and after childbirth saves the lives of women and newborn babies (7). However, most deliveries in developing countries occur at home without skilled birth attendants. Health facility delivery can contribute to 16%–33% reduction of maternal death (14). The use of maternal health services also contributes to neonatal health outcomes as the health of the mother and the newborn is closely linked. Available evidence indicated that twenty nine percent (29%) reduction of neonatal death in low and middle income countries achieved by health facility delivery (15). It is therefore important that pregnant women have skilled obstetric attendance during delivery.

1.2 Statement of problem

Globally, there were an estimated 289 000 maternal deaths in 2013, yielding an MMR of 210 maternal deaths per 100 000 live births. Developing countries account for 99% (286 000) of the global maternal deaths (8). Hemorrhage and Hypertensive disorders are the leading causes of maternal mortality in developing countries (7). However, most of the maternal deaths are preventable if deliveries were overseen by skilled personnel (10). International conference on population and development aims at having at least 90% of deliveries attended by skilled health care providers by 2015 as a strategy in reducing maternal mortality (16). However, in developing regions 40 million births were not attended by skilled health personnel, and from which over 32 million occurred in rural areas in 2012 (9). Delivering at health facilities enables women receive proper medical attention and care during childbirth. This is fundamentally encouraged as a single most important strategy in preventing maternal and neonatal deaths. In almost all countries where more than 80% of deliveries attended by health professionals, MMR is below 200 per 100,000 live

births (17). There is disparity between developing and developed countries regarding maternal health care service utilization. In developed countries an approximate of 97% of the pregnant women receive ANC and almost all births , 99% use skilled obstetric service at delivery, while in developing countries only 52 per cent of pregnant women had four or more antenatal care visits during their pregnant time and skilled health personnel attended 68 per cent of deliveries in 2012 (9). Sub-Saharan Africa is the region with the lowest coverage of skilled delivery service utilization, with 53% of women having skilled delivery attendants (9).

Despite the Ethiopian government's efforts to expand health service facilities and promote institution based delivery service in the country, an estimated 85% of births still take place at home. This under-utilization of maternal healthcare services by a sizeable proportion of women in Ethiopia results in insignificant decline of maternal mortality ratio (18,19). No substantial reduction in home or unskilled deliveries was observed, especially in the rural community of Ethiopia in which urban births are more likely than rural births to be delivered in a health facility (63 percent versus 10 percent) (20). One critical strategy for reducing maternal morbidity and mortality is ensuring that every baby is delivered in the health facilities with the assistance of a skilled health attendant (9). Therefore, to reduce maternal deaths, the most efficient strategy for lower-income countries is to promote childbirth at health facilities with a referral capacity, as timely management and treatment can make the difference between life and death (7).

As evidenced from previous studies, utilization of institutional delivery service was determined by educational status of mothers and their husbands, knowledge of health problems during pregnancy, antenatal care visits, mothers' place of residence, age of the mothers, perceived distance to the nearest health facility (21–26). However, there are several inconsistent reports of the findings regarding Educational status of mother and maternal age (27–29), antenatal care visits(30,31), mothers' place of residence (32,33), knowledge of health problems during pregnancy (34,35), perceived distance to the nearest health facility (36), women's autonomy (29,34,37,38) and availability of radio or TV (36,37,39). Even though many individual studies conducted in Ethiopia identified determinants for institutional delivery service utilization, So far there was no systematic review conducted to show pooled effect of the determinants. Therefore, the aim of this review was to summarize the findings of all relevant individual studies regarding determinants for

institutional delivery service utilization in Ethiopia, thereby making the available Evidence accessible for decision makers.

CHAPTER TWO: LITERATURE REVIEW

Delivery at health institutions are affected by a complex range of factors, some of which are rooted in social and cultural norms, in the reproductive histories and individual women related background factors. Previous studies done in Ethiopia showed that there were variation in health facility delivery utilization, 12.3% in Munisa district (36), 4.3% of rural mothers and 40% urban mother in Arsi(21), 78.8% in Bahirdar (22), 4.1% in Tigray (23) and 12% in Southwestern Ethiopia (38). Available evidence on reason for home delivery was precipitating or short labor, health facility too far, home delivery is good for privacy of mothers and Not knowing the advantages of giving birth at health institution (21,24,37). In this review factors associated with institutional delivery is categorized as Predisposing factors, Enabling factors and Need factors after review of some of the relevant literatures.

Predisposing factors

Maternal and Paternal Educational status

The educational status of the women and that of their partners had strong relationship with the health facility delivery. Educated women most probably have better sense of appreciation and concern for their health. They have also improved ability to afford the expenditure of health care. Studies conducted in different parts of Ethiopia identified significant association of maternal education with utilization of institutional delivery service. Women's those attended secondary and above educational level were more likely to deliver in health institution than women with no formal education (25,32,34,37,39). However, the effect of a woman's level of education attainment did not have any statistical significance on delivery at health facilities in a cross-sectional study conducted in different parts of Ethiopia (27–29).

Similarly Educational Status of partner determined place of delivery. women whose their husbands attended secondary and above educational level were more likely to use health institution for delivery service than those women their husband were illiterate (34,40,41). The odds of using delivery care has decreased by around 29% for mothers whose husband had no formal education compared to those whose husbands had primary or higher education (42). Those women whose husbands were illiterate were less likely to choose health facility as delivery place when compared to women whose husbands received secondary education and above (43).

Maternal age

Age of the mother was the other predictor for institutional delivery service utilization. Several studies carried out in different parts of Ethiopia indicated that younger women are more likely to give birth in health institution than their counterpart (19,25,36,37,44). However, other studies conducted in different parts of Northwest Ethiopia: Bahirdar, North Gondar and Dabat district and central part of Ethiopia, Holeta district identified insignificant association of maternal age with institutional delivery service utilization (22,26,40,45). In contrary studies done in Wukro and Butajera districts in the Northern and South Central Ethiopia showed, the odds of delivery in health facility among women of 30 years old or above was about twice higher than those younger than 20 years old (32).

Women's Autonomy

Decision-making power regarding one's own healthcare may have impact on health facility use for delivery service. In many countries, women cannot decide on their own to seek care, but have to seek permission from a husband or mother-in-law. Furthermore, women may lack control over material resources needed to pay for expenses. Several studies identified association of women's autonomy with use of institutional delivery care. Autonomous women were more likely to utilize institutional delivery service than non-autonomous women (21,28,31,40,46). In addition, decision made by women only or with her husband jointly increases utilization of the service as compared to decision made by other as evidenced by study conducted by Birmata et al in 2013 (26). In contrast other study conducted by Hagos et al in 2014 showed that, women who were autonomous in decision making about place of delivery were less likely to deliver in health facility than non-autonomous (32). On the other hand, Autonomous women's and non-autonomous women's doesn't have difference regarding utilization of institutional delivery service as illustrated by different studies done in Ethiopia (29,34,37,38).

Parity

Institutional delivery service utilization is also determined by number of alive children the women have. Studies conducted in Ethiopia illustrated significant association between parity and institutional delivery. Women with parity of one are more likely to attended delivery service provided at health facility than women of parity two and above (19,21,26,27,36). However, other studies conducted in Ethiopia showed insignificant association of parity and institutional delivery

service utilization as evidenced by studies in Northwest Ethiopia Woldia district, bahirdar city administration and study in Dabat district(30,33,45).

Age at first pregnancy

Age at the women become pregnant for the first time was the other obstetric factors related with utilization of institutional delivery service as stated in literatures. Women's those become pregnant before they reach 20 years old were 60% less likely to utilize institutional delivery than their counter parts as shown in study conducted in Arsi zone(21). Other study in Assosa district, Benishangul gumuz regional state stated, women's who had their first pregnancy after 20 years were more likely to give birth in health facility than those become pregnant before 20year (47). In contrary, age at first pregnancy were not significantly associated with institutional delivery service utilization in other studies conducted in Ethiopia (40,48).

Enabling factors

Residence of the mother

The areas were the women lives determine place of delivery. Living in an urban area helps women to seek modern health care than living in rural areas due to health facilities accessibility in urban areas. Many studies in Ethiopia indicated significant association of residence setting with institutional delivery service utilization. women resided in urban area were more likely to deliver in health facility than their counterparts (22,36,45). In other word, mothers living in rural area were less likely to use institutional delivery services than urban mothers(30,40). However in some of studies there is no difference between urban and rural women regarding utilization of institutional delivery (32,33).

Knowledge of mother on danger sign

Mother's knowledge of danger sign during pregnancy, labor and delivery had relationship with health facility use for delivery service. In study conducted in Banja, Amhara regional state and Arsi, Oromia Regional state, mothers who had knowledge on danger signs of pregnancy were more likely to use institutional delivery service than mothers who were not knowledgeable (21,37). In addition , Mothers whose general knowledge about obstetric complications are poor were more likely to give birth at home than those mother whose general knowledge about obstetric complications were good as evidenced by case control study conducted in Bahirdar (22). In

contrary, study conducted in Ethiopia on determinant of delivery practice knowledge of danger sign during pregnancy did not have any statistical significance association with institutional delivery service utilization (34,35) .

Possession of Radio/TV

Possession of radio or TV was also the predictor for institutional delivery that researchers identified. Women's from household do not have Radio/TV were less likely to delivery at health institution than those women with access to radio or TV, as evidenced by studies conducted in Gondar (40), Holeta (26), North west Ethiopia, Dabat district (45) and Sekela district (25). However, in other studies, availability of radio or TV and institutional delivery service utilization was not significantly associated in different parts of Ethiopia (36,37,39).

Distance

Distance from nearby health facility, is one of factors related to physical accessibility to health institution which determine use of health facility for delivery service. The scarcity of vehicles especially in remote areas, cost of transport, poor road conditions and the difficulty of walking for hours to the nearest health facility may also pose problems for pregnant women. women who traveled less hours to reach health facility is more likely to deliver at health institution than those who travel more time (24,25,39,49). In addition study conducted in Gilgel Gibe HDSS in Jimma zone, Southwestern Ethiopia, also identified association between distance and institutional delivery service utilization , women who live in distance of greater than one hour from health facility is less likely to deliver in health institution than their counterpart (38). However, other studies conducted in Arsi zone ,munesa district, distance to health facility is not significantly associated with institutional delivery (36).

Need factors

Antenatal care visit

Antenatal care with a skilled provider is one of the interventions that reduce maternal mortality. In addition to detecting malformation problem and other risks antenatal care visit provide opportunity to delivery at health institution by giving information on advantage of giving birth in health facility and influence women`s decision to have a skilled attendance during child birth. Majority of studies in Ethiopia identified as antenatal care visit was the most important predictors for institutional delivery service utilization. Women who had at least one registered prenatal visit were more likely to utilize the service than those who did not attended it, (21,35,50,51). In contrary ANC attendance did not show statistically significant association with institutional delivery service utilization in some of studies conducted in Ethiopia (30,31).

Frequency of ANC visit

WHO recommends that every pregnant woman should have at least four standard antenatal care visits during a pregnancy, visiting ANC as recommended was expected to increases utilization of institutional service. This might be because during an antenatal care visit women's were provided with health education and information about the benefits of giving a birth in the health facility for the child as well as for the mother's health. women with more ANC visit were more likely to deliver with the assistance of a skilled attendant as shown from studies in different parts of Ethiopia (27,39,45,49). In contrary, in study conducted in Bale zone oromia regional state, attending at least four standard antenatal care visits did not show significant association with institutional delivery service use (34).

Type of pregnancy (planned or unplanned)

Planned pregnancy were expected to increase utilization of institutional delivery service. But the available evidence in different parts of Ethiopia indicated insignificant association of type of pregnancy as defined by planned and unplanned with institutional delivery service utilization. Women's those planned their pregnancy were doesn't showed significant disparity regarding utilization of institutional delivery service from those not planned their pregnancy as evidenced by researches conducted in different parts of Ethiopia (27,38,51).

Problems during pregnancy

Problem during pregnancy attached greater importance to the acceptance and utilization of medical care including utilization of institutional delivery service utilization than those who had uncomplicated pregnancy. History of experienced problem during pregnancy increases utilization of health institution for delivery service as shown from available evidences in Ethiopia. Women encountered problem during pregnancy were more likely to deliver in health institution than those women not encountered problem during pregnancy (27, 31,38–40, 52, 53).

Conceptual framework

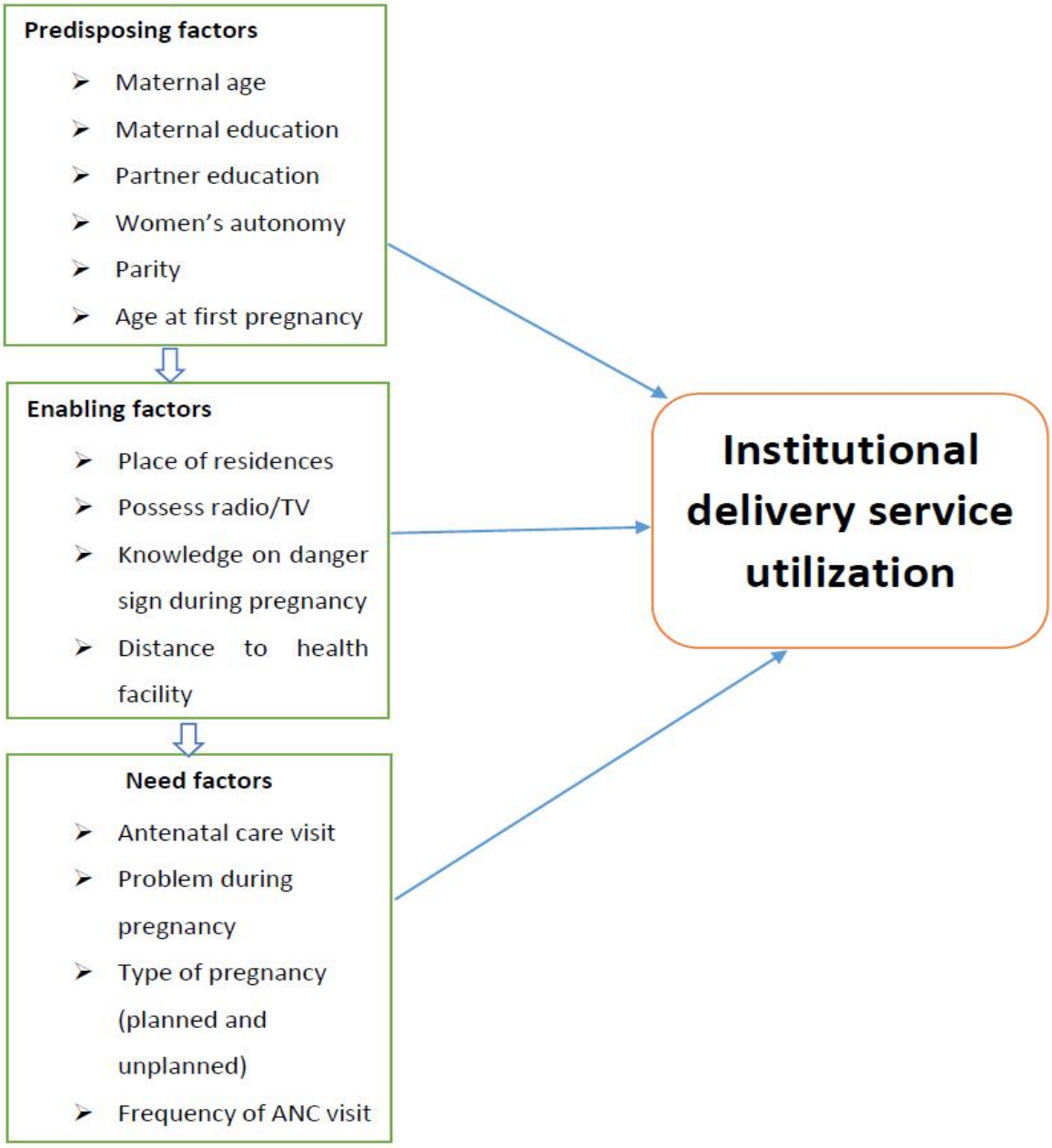

Figure 1 conceptual frame work adapted from Karkee R et al 2011 and Melaku Fekadu, Nigatu Regassa, 2014

Significance of the review

Health care decisions should be informed by the best available research evidence. However, this can be difficult given the large amounts of information generated by individual studies which may be biased, time and context dependent. Furthermore, individual studies can reach conflicting conclusions. This was also true for available evidence regarding determinants of institutional delivery service utilization in Ethiopia. In such situations, it was not always clear which results are the most reliable or basis for best practice and policy decisions. Previously there was systematic review conducted in developing and Sub-Saharan countries on factors associated with institutional delivery service utilization. However, in meta-analysis conducted in developing countries, even though there are studies from Ethiopia included, the review focus on socio demographic factors and studies included from other African countries might have influence on estimated effect size. In the review conducted in sub-Saharan Africa small numbers of studies conducted in Ethiopia were included that affect the generalizability of the results to Ethiopia and also statistical summarizations of the factors were not done. Synthesizing the finding of all relevant studies is important for planning interventions, developing effective strategies and to make sound decision for addressing determinants of institutional delivery service institution by making available evidence accessible for decision makers. The results also benefits the society in general and women and children in particularly to have a better utilization of the services which will improve their health status and wellbeing if effective implementation done to address the identified determinants. As well as setting out what we know about particular available evidence, this review can also help to reveal where knowledge is lacking which can then be used to guide future research.

CHAPTER THREE: OBJECTIVE AND REVIEW QUESTION

3.1 General Objective

The main aim of this review was to synthesize the available evidence on determinants for institutional delivery service utilization among women who have had at least one birth in Ethiopia, 2015.

3.2 Specific objectives

- ✓ To synthesis predisposing factors for utilization of institutional delivery service in Ethiopia.
- ✓ To synthesis Enabling factors for utilization of institutional delivery service in Ethiopia.
- ✓ To synthesis need factors for utilization of institutional delivery service in Ethiopia

Review Question

What is the best available evidence on determinants for utilization of institutional delivery service in Ethiopia?

CHAPTER FOUR: METHOD AND MATERIALS

4.1 Inclusion criteria

Type of participant and setting

The settings for the review focus on Ethiopia by attempting to provide the national decision makers with best available evidence regarding determinants for institutional delivery service utilization. Ethiopia is one of Sub Saharan country with total population of 95.9 million in 2014. The country is a Federal Republic having nine Regional States, two city administrations. The country is among the least urbanized country in the world with 83% living in rural areas whilst 17% of the total population living in urban areas(54). The maternal health service coverage of the country was ,42% family planning of any method, from which 40% modern FP methods, 40% Ante natal care visit and 34% ANC visit as recommended by WHO, 15% and 12% birth in health facility and received postnatal care within the first two days of delivery respectively (20).

The study participant of interest in this review was Women of reproductive age group, in age range of 15-49 years, who have had at least one birth.

Focus of the review /phenomena of interest

The phenomena of interest of this review were Epidemiological Association of:-
Predisposing factors with institutional delivery service utilization.
Enabling factors with institutional delivery service utilization and,
Need factors with institutional delivery service utilization in Ethiopia.

Types of Studies

All observational study designs (cohort, case–control and cross-sectional studies) that assessed predictors or determinants of institutional delivery service utilization were included in the review.

Outcome

For this review studies reporting institutional delivery service utilization or facility based delivery as the outcomes of interest for their study were included.

4.2 Search strategy

Literature search strategies were implemented with the aim of finding both published and unpublished primary studies conducted in Ethiopia from 2000 to 2014 on determinants of institutional delivery service utilization. The reviewed studies were accessed through electronic web based search strategy from PUBMED, HINARI, Mendley reference manager, Cochrane Library for systematic reviews and Google Scholar. A three-step search strategy were utilized in this review. An initial limited search of PUBMED and HINARI were undertaken followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe article. A second search was undertaken across all included databases using all identified keywords and index terms. Thirdly, the reference list of all identified reports and articles were searched for additional studies. Hand searching were conducted for studies in Jimma university libraries regarding topic of review.

4.3 Study selection

Articles were identified by first analyzing titles and abstracts for relevance and compliance with preset selection criteria. Relevant articles were classified as included and excluded. Full texts of articles categorized as included were extracted systematically by using a standardized data extraction tool from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instruments. The following Search terms were used**:** “determinants”, “associated factors” and “predictors” with “Institutional delivery service utilization”, “Facility based delivery” and “maternal health service utilization” using the Boolean logic (AND, OR). Articles that not reported required data for meta-analysis were excluded.

4.4 Assessment of Methodological Quality

The scientific quality of selected studies was assessed. Standardized critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instruments were used to assess the methodological quality of studies. According to JBI criteria's for assessing quality of primary studies, those primary studies which met 60% and above were included for meta-analysis. Any disagreements that arise were resolved through discussions. Quality assessment tool is attached as Appendix 1.

4.5 Data collection

Quantitative data were extracted from papers included in the review using the standardized data extraction tool. From all selected studies, the following data were extracted: name of author, year of publication, region were study conducted, study design, sample size, predictor variables assessed. Standardized data extraction tool from Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instruments were used. Data extraction tool is attached at Appendix 2

4.5 Data Synthesis

Synthesis was begun by constructing a clear descriptive summary of the included studies. This was done by tabulating details about name of author, year of study or year of publication, study design and numbers of participants. Quantitative data were pooled in statistical meta-analysis using Review Manager Software V5.3. All results were subject to double data entry. Association effect sizes and their 95% confidence intervals were calculated for analysis. Heterogeneity was assessed using the standard I^2 test.

4.6 Data Quality control measures

Search beyond published literature was done to reduce the risk of publication bias and quality of included studies were assessed by using standardized critical appraisal tool from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instruments.

4.7 Ethical Consideration

Ethical approval letter was obtained from Ethical Review Board of Jimma University. Letter of support was also obtained from Jimma University College of health science, Department of population and family health.

4.8 operational definitions and definitions of terms

Antenatal care visitor: If a women visited health facility during pregnancy for getting pregnancy related service.

Antenatal care non visitor: If a woman not visited health institution during pregnancy for obtaining a service related to pregnancy.

Close to health facility: If a woman travelled less than 5killometer to reach health facility (49)

Far from health facility: If a woman travelled 5killometer and more than to reach health facility,

Home delivery: when a mother gave birth at her home or others home (neighbor, relatives, family) or when a birth takes place outside of health institution (23).

Institutional delivery utilization: when a mother gave birth at health institution (health center, hospital and private clinic)

Knowledgeable: women were considered knowledgeable about danger signs related to pregnancy if they scored above the mean or median of knowledge questions and not knowledgeable if otherwise (21).

Woman's autonomy: if a woman were decided on place were to give birth by herself or with her husband jointly.

Non-autonomous women: If a decisions on place were to give birth was made by others (husband only, mother in law, father in law, or other people).

4.9 Plan for dissemination

The results will be presented to Jimma University, population and family health department. It will also be communicated to concerned bodies (Regional Health Bureau, Federal Minister of Health and different Non-governmental organizations) through report and may also be presented in different seminars, meetings, workshops. Further efforts will be made to publish the findings on national or international peer reviewed journal.

CHAPTER FIVE: RESULTS

5.1 Description of studies

A total of 202 articles were retrieved. After removing duplicated retrievals, 82 articles remained, of which 41 were excluded during the initial assessment due to inconsistency with inclusion criteria set for the review. For the remaining 41 articles, abstracts were accessed and screened. However, three of the articles were removed because outcome variables are not the same with the outcome measured definition of the review. As a result, 38 articles screened for full text based on the pre-set criteria. Finally, 34 studies fulfilled the eligibility criteria and included in quantitative meta-analysis. From a total of 34 articles that meet inclusion criteria for meta-analysis, eight of the studies were grey literatures. Three out of the 34 studies used secondary data from Ethiopian demographic and health survey data. All of the studies that meet inclusion criteria relayed on household survey.

Regarding study design 30 out of 34 studies employed community based cross sectional study design; three were employed case control study design while the left one used prospective cohort. The original sample size for each study ranged from 295 in prospective household follow up study in Jimma town, Oromia regional state to 7978 study that analyzed Ethiopian demographic data of 2000. Majority of the articles were published in 2013. Out of 31 studies that collected primary data nine were conducted in Oromia regional state, twelve in Amhara regional state, four in Southern Nation Nationalities and peoples of Ethiopia, two in Benishangul Gumuz regional state, two in afar regional state, one in Tigrai regional state, and the other one study conducted in two regions of Ethiopia Tigrai and SNNP.

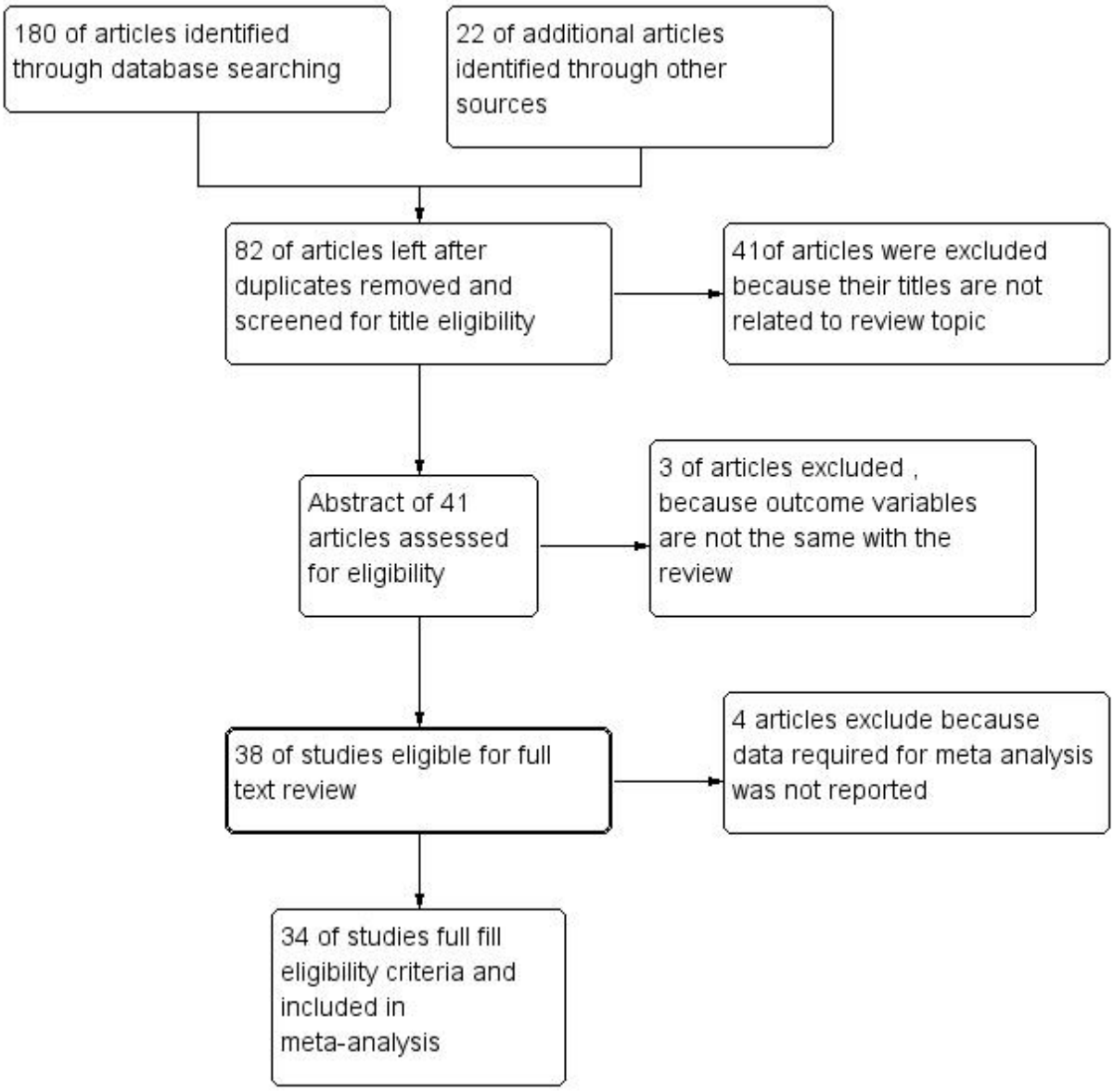

Figure 2 *flow chart showing the procedure of selecting studies for the meta-analysis of factors associated with institutional delivery service utilization in Ethiopia, 2000-2014*

Table 1 Summary of studies included for Meta-analysis of determinants for institutional delivery service utilization in Ethiopia, 2000-2014.

Author	**Year**	**Country/Region**	**Study design**	**Sample size**
Mekonnen Y et al	2003	Ethiopia	Community based cross sectional	7,978
Nigussie M et al	2004	Amhara region, North gonder	Community based comparative cross sectional	1242
Melkamu Fanta	2005	Afar region, Assaita & dubti	Community based cross sectional	642
Gurmessa T et al	2008	B/Gumuz, Metekel zone	Community based cross sectional	1038
Abiyot Asres	2008	SNNP, sheka zone	Community based cross sectional	554
Freweini G/Hiwot	2009	Amhara region, Ephratanagidim district	Cross sectional household survey	605
Eyerusalem Dagne	2010	Ethiopia	Community based cross sectional	5115
Tarekeny et al	2014	Ethiopia	Community based cross sectional	7,908
A. Wolelie *et al*.	2014	Amhara Region, Banja District,	community-based cross sectional	394
Abebe et al.	2012	Bahir Dar Special zone	case control study	324
Abeje et al.	2014	Bahir Dar City administration	Community based cross sectional	484
Kebede et al	2013	Chilga, Northwest Ethiopia	community-based cross-sectional	475
Mengesha et al.	2013	Dabat district, Northwest Ethiopia	community based nested case control	1065
Fikre and Demissie	2012	Oromia region ,dodota Woreda	community based cross section	506
Feyissa TR, Genemo GA	2014	East Wollega zone, Oromia regional	Retrospective unmatched case control	320
Endalkachew Desalegn *et al.*:	2013	Amhara Region, Fogera District	Cross-sectional community based	412
Daniel B et al.	2014	Goba woreda, Bale zone, oromia regional state	Community based cross sectional	580

Author	Year	Country/Region	Study design	Sample size
Worku et al.	2013	North Gondar Zone, Amhara Region	linked facility and population-based survey	1668
Amano et al	2012	Munesa Woreda, Arsi Zone, Oromia Regional state	community-based cross-sectional	855
Teferra et al.	2012	Sekela District, Amhara Region	Community-based cross-sectional	371
Hailemichael F,et al	2013	Wolaita Sodo (Sodo) town,SNNP	Community based cross-sectional study	844
Zegeye et al	2014	Jimma Horro District, Kellem Wellega Zone, Oromia Regional State	community-based cross-sectional	528
Tsegay et al.	2013	Tigray regional state , Samre-Saharti district	community-based cross-sectional	1115
Worku Awoke *et al.*:	2013	Woldia, North Ethiopia, Amhara Region	Community based cross sectional	478
Hagos et al	2014	Wukro and Butajera. Tigray Regional state and SNNP respectively	community based cross sectional	4949
Mekonnen MG et al	2012	Afar regional state	cross-sectional design	502
Shiferaw et al.	2013	Kembatta-Tembaro,	cross sectional household survey	909
Wado et al.	2013	Gilgel Gibe, Jimma zone, Southwestern Ethiopia	cross-sectional study	1370
Mulumebet A. et al	2011	Arsi zone, oromia regional state	comparative cross-sectional community based	1089
Muluwas Amentie	2012	Assosa District, B/Gumuz regional state	community based cross sectional	536
Ewnetu Getachew	2012	Debre Markos town, Amhara regional state	Community based cross sectional	376
Chencha Melaw	2012	Chencha distric G/Gofa zone ,SNNP	Community based cross sectional	651
Fetene T et al	2014	West wollega zone, oromia regional state	Community based cross sectional	425
Biniyam Ayele	2005	Jimma town, oromia region	Prospective community based follow up	295

5.2 Findings of the review

5.2.1 Predisposing factors that determined institutional delivery service utilization

Mother's age

The age of the mother was significantly associated with institutional delivery service utilization. Younger mothers (age less than 25 years old) were 1.8 times more likely to deliver in health institution than older mothers (25 years and above) [OR (95%CI) 1.77(1.29, 2.42)]. Heterogeneity test is (I^2 = 75%), thus random effect model was assumed in the analysis. Sensitivity analysis was done no change was distinguished in the overall odds ratio.

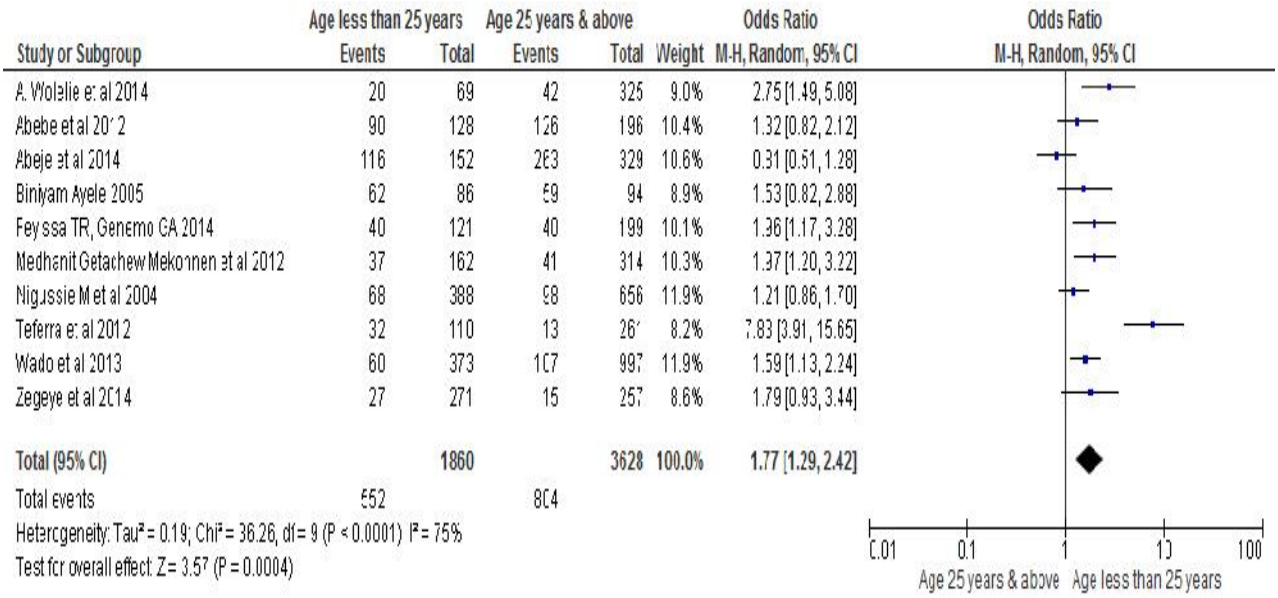

Figure 3 ***Association of maternal age with institutional delivery service utilization in Ethiopia, 2000-2014.***

Mother's educational level

The finding of review indicated significant association between mother educational status and utilization of institutional delivery service. Mothers those attended primary and above primary educational level were almost five times more likely to give birth at health institution than uneducated mother [OR (95%CI) 4.95 (3.94, 6.21)]. Heterogeneity test is I^2 = 93%, therefore random effect model was assumed in the analysis. Sensitivity analysis did not bring significant change in the overall odds ratios.

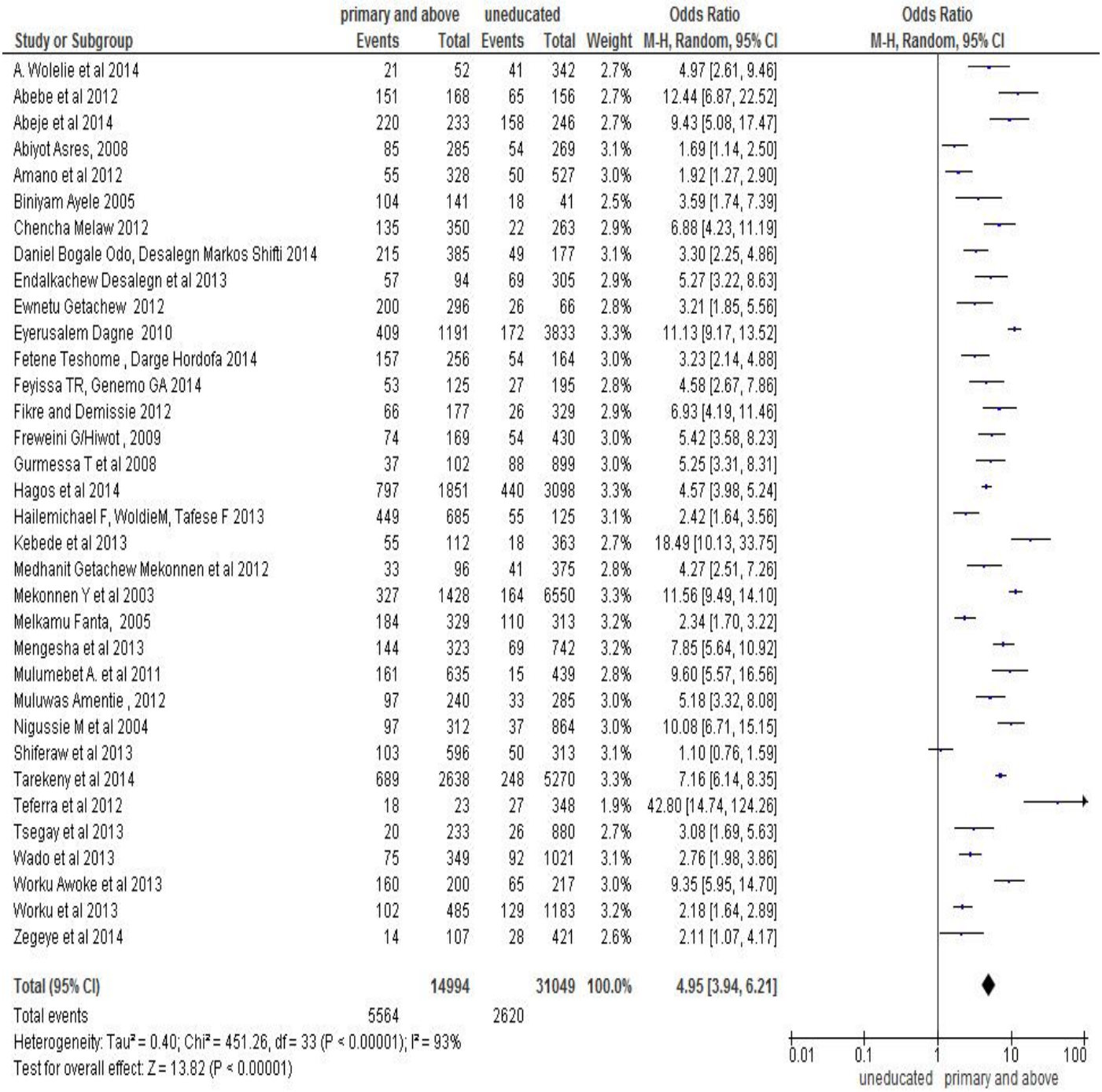

Figure 4 *Educational status of the mother with institutional delivery service utilization in Ethiopia, 2000-2014.*

Husband educational level

The chance of delivering in health facilities among those women that their husband attended primary and above primary educational level were 4.4 fold higher than those women their husband

not attended any educational level [OR (95%CI) 4.43(3.16, 6.21)]. The heterogeneity test is I^2 = 88%. So, random effect model was assumed in the analysis. Sensitivity analysis was done and revealed the stability of overall effect size.

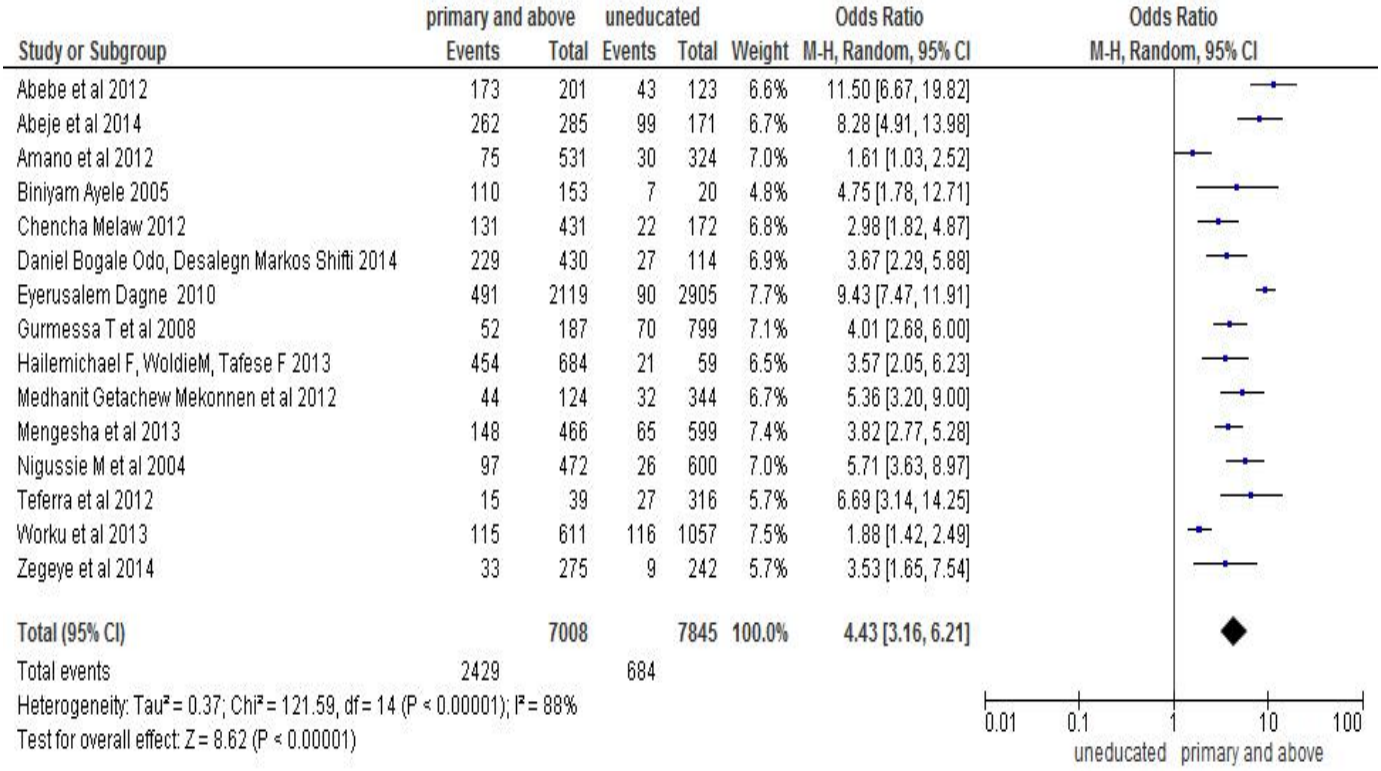

Figure 5 *Educational status of the husband with institutional delivery service utilization in Ethiopia, 2000-2014.*

Women's autonomous

The finding of this review showed insignificant association of utilization of institutional delivery service with women's autonomy [OR (95%CI) 0.8 (0.47, 1.36)]. Random effect model was assumed during analysis due to heterogeneity test (I^2 = 95%). Sensitivity analysis was done and no change was noted on overall odds ratio

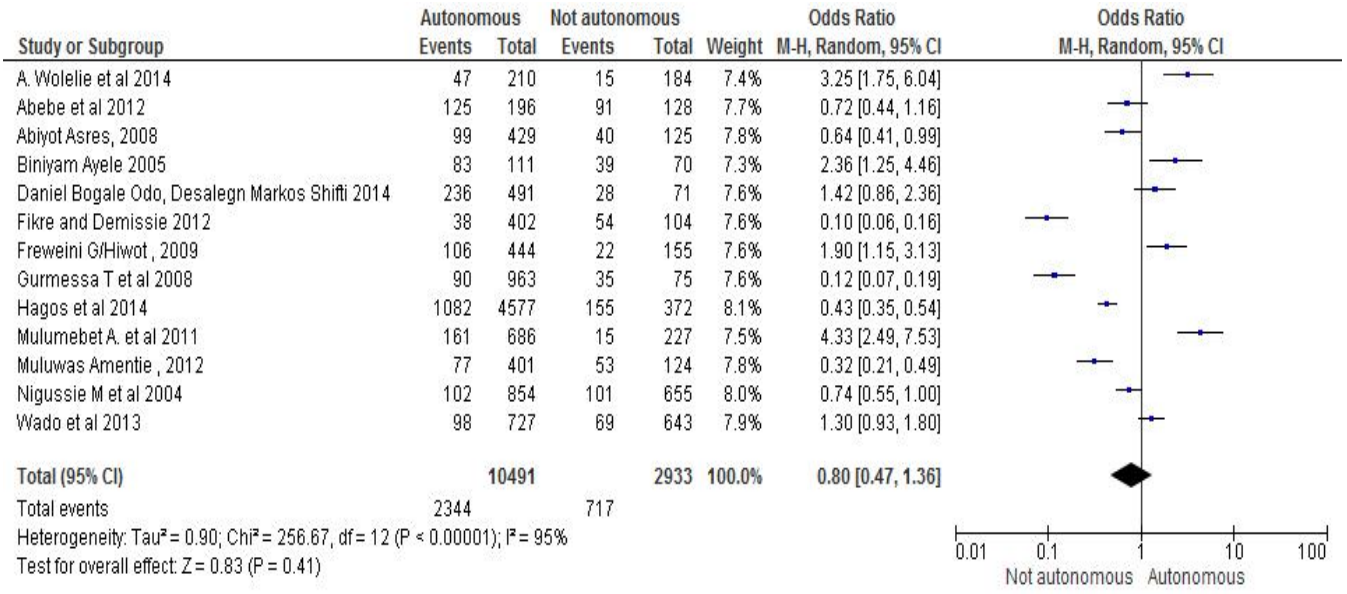

Figure 6 *Association of women's autonomy with institutional delivery service utilization in Ethiopia, 2000-2014*

Parity

Number of children the women delivered was significantly associated with institutional delivery service utilization. Parity one women were three times more likely to give birth in health facility than multiparous women [OR (95%CI) 3.05(2.68-3.49)]. Heterogeneity test is I^2= 72%. Therefore, random effect model was assumed in analysis. Sensitivity analysis was done and no significant change was observed in overall odds ratio.

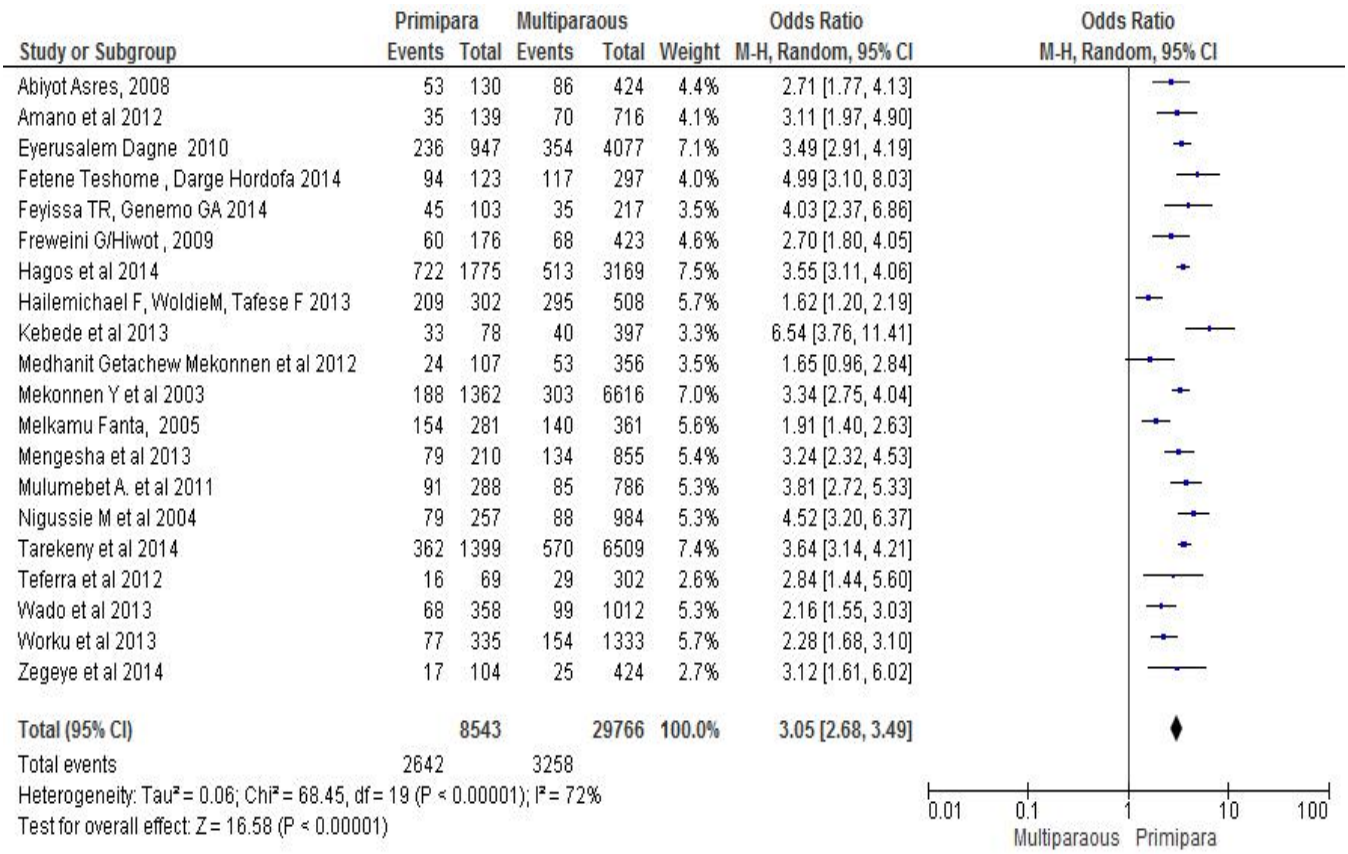

Figure 7 *Association of parity with institutional delivery service utilization in Ethiopia, 2000-2014*

Age at first pregnancy

Age at first pregnancy were associated with institutional delivery service utilization. Women's who had their first pregnancy after 20 years were 2.8 times more likely to give birth in health facility than those become pregnant before 20years. [OR (95%CI) 2.75 (1.83, 4.16)]. Heterogeneity test is I^2= 85%, thus random effect model was assumed in the analysis. Sensitivity analysis was done and illustrated stability of overall odds ratio.

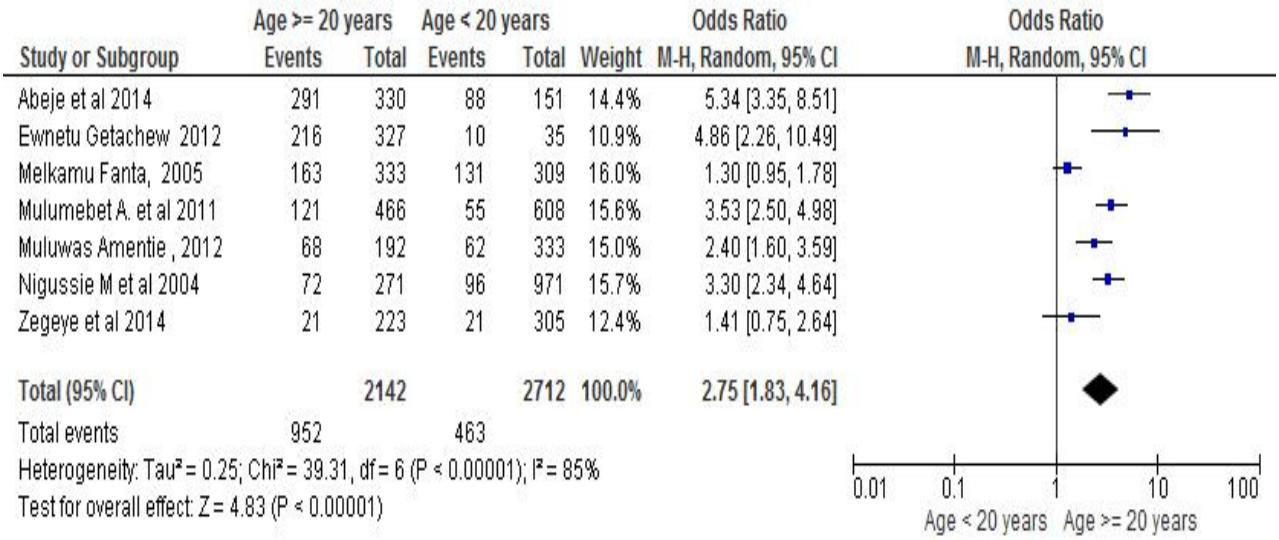

Figure 8 *Association of age at first pregnancy with institutional delivery service utilization in Ethiopia, 2000-2014*

5.2.2 Enabling factors that determined institutional delivery service utilization

Residence

Findings of this review showed residence setting (as defined by rural and urban) was one of the enabling factor that determine utilization of institutional delivery service. Women from urban area were 13.2 times more likely to deliver in health institution than women from rural area [OR (95 CI), 13.16(9.44-18.35)]. Heterogeneity test is (I^2 = 95%), thus random effect model was assumed in the analysis. Sensitivity analysis was done no change was noted in the overall odds ratio.

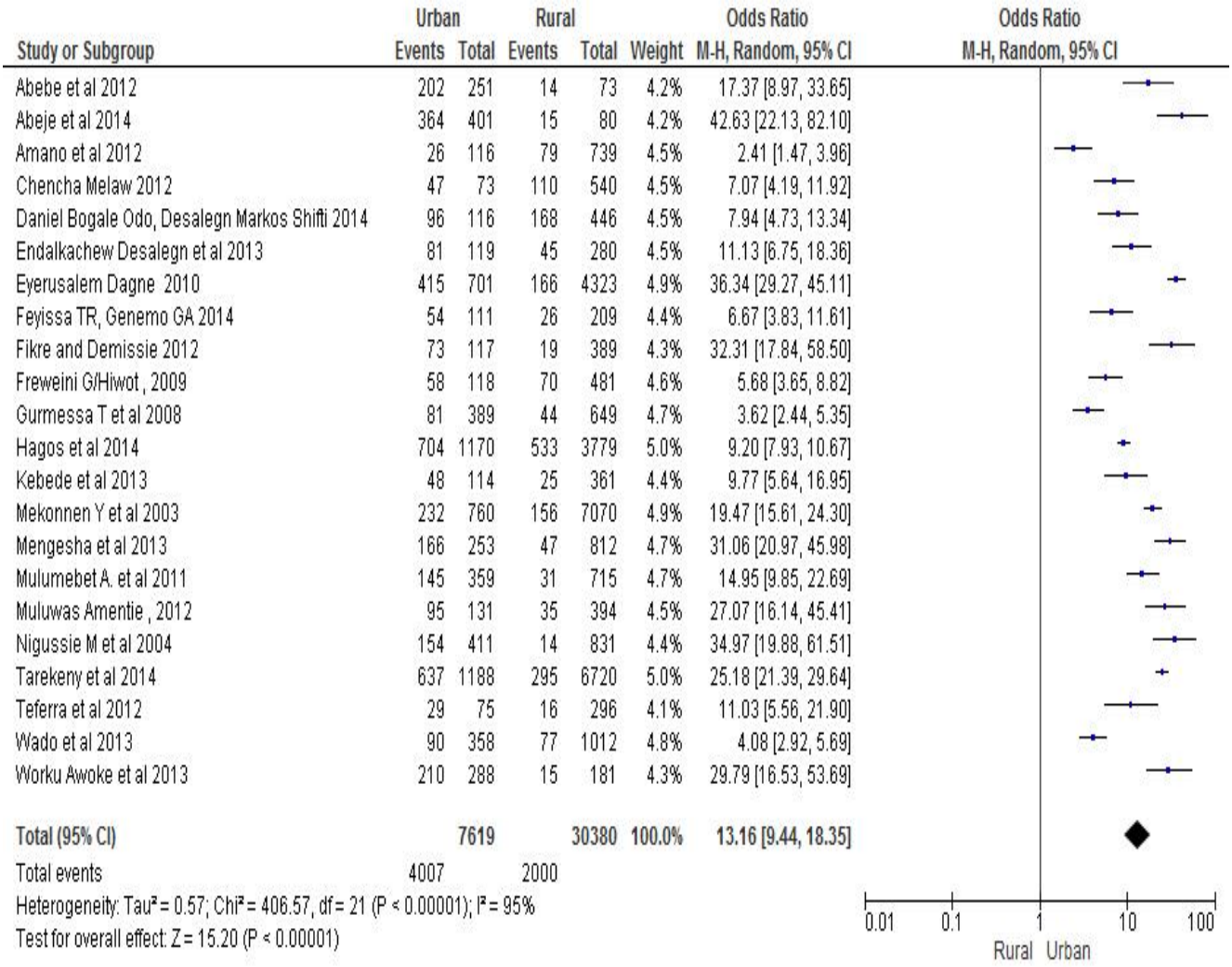

Figure 9 *Association of place of residence on institutional delivery service utilization in Ethiopia, 2000-2014.*

Knowledge of mothers on danger sign during pregnancy

Knowledge of danger sign during pregnancy was increases the probability of utilizing health institution for delivery service. Women's who were knowledgeable about danger sign during pregnancy were 2.2 times more likely to give birth in health institution than those women who were not knowledgeable about danger sign during pregnancy [OR (95%CI) 2.17(1.17, 2.76)]. Heterogeneity test illustrated moderate variability, I^2 = 61%. Thus random effect model was assumed in the analysis. Sensitivity analysis was done no change was observed in the overall odds ratio.

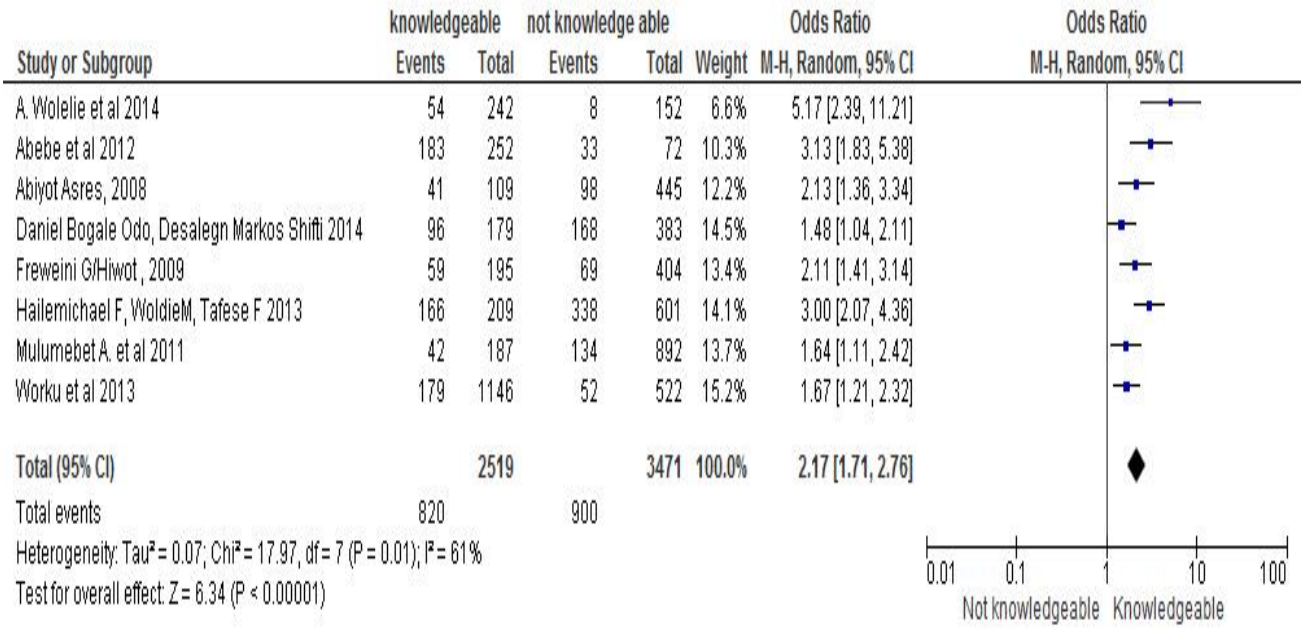

Figure 10 Association of knowledge of danger sign during pregnancy with institutional delivery service utilization in Ethiopia, 2000-2014

Possession of radio /TV

Those mothers possess radio or TV were 3.6 times more likely to utilize delivery service in health facilities than households who did not have radio or TV [OR (95%CI) 3.63(2.05, 6.41)]. Heterogeneity test was I^2 = 93%, consequently random effect model was used during analysis. Sensitivity analysis was done and no significant change was demonstrated on the overall odds ratio.

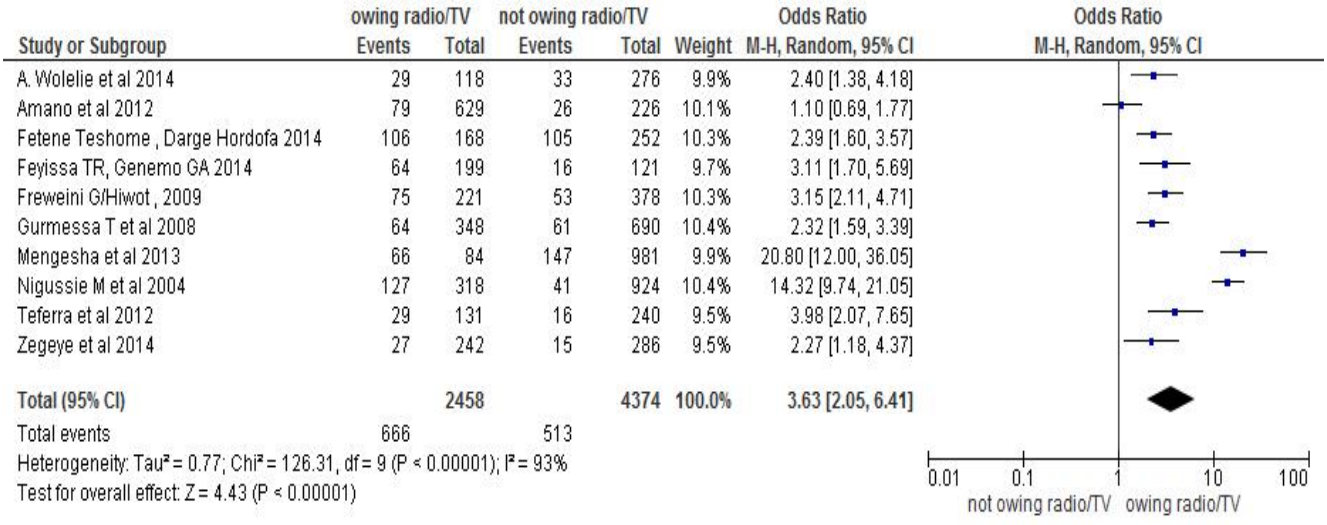

Figure 11 Association of availably of radio or TV with institutional delivery service utilization in Ethiopia, 2000- 2014

Distance from nearby health facility

Distance from nearby health facility was predictor for institutional delivery service utilization. Those women traveled less than five kilometer to nearby health facility were 2.6 times more likely to deliver in health institution than those women traveled more than five kilometer[OR(95%CI) 2.64(1.72, 4.05)]. Heterogeneity test was 80%, so random effect model was assumed in the analysis. Sensitivity test was done and no significant variability of overall odds ratio was observed.

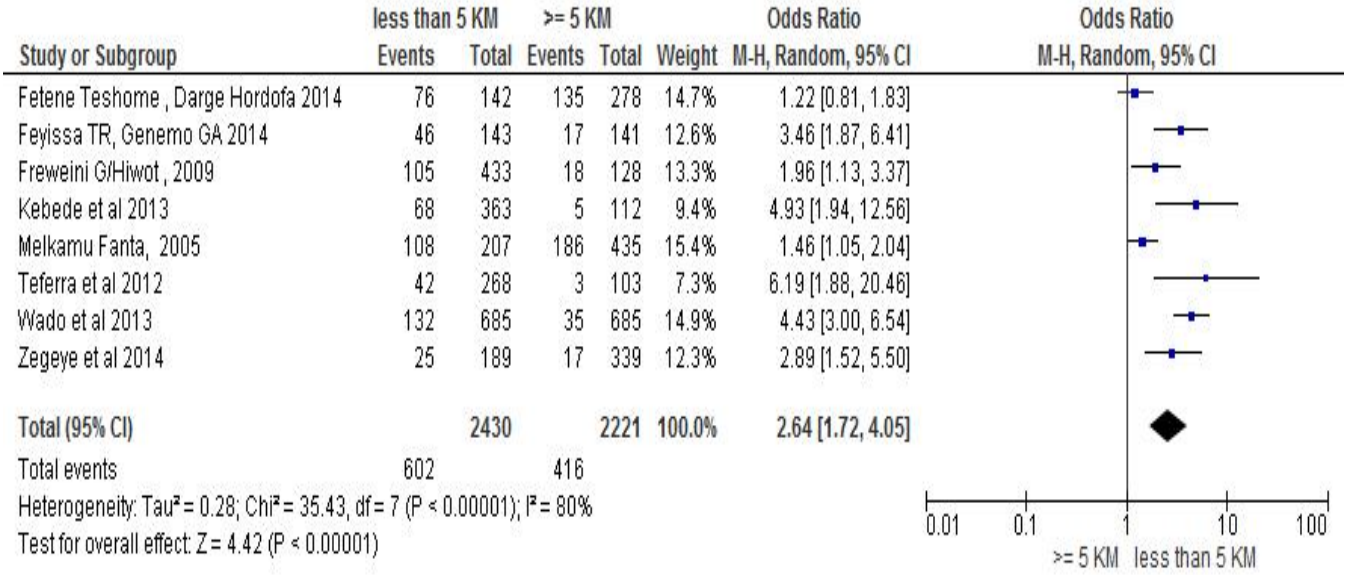

Figure 12 *Association of distance from nearby health facility with institutional delivery service utilization in Ethiopia, 2000-2014*

5.2.3 Need factors that determined institutional delivery service utilization

Antenatal care visit

Antenatal care visit was the other factor that determined institutional delivery service utilization. Women who had at least one registered prenatal visit were 5 times more likely to utilize the service than those who did not visited ANC during their pregnancy time [OR (95%CI) 5.11(4.55-5.72)]. Heterogeneity test was I^2 = 88%. Therefore, random effect model was assumed in the analysis. Sensitivity test was done and no change was noted on overall odds ratio.

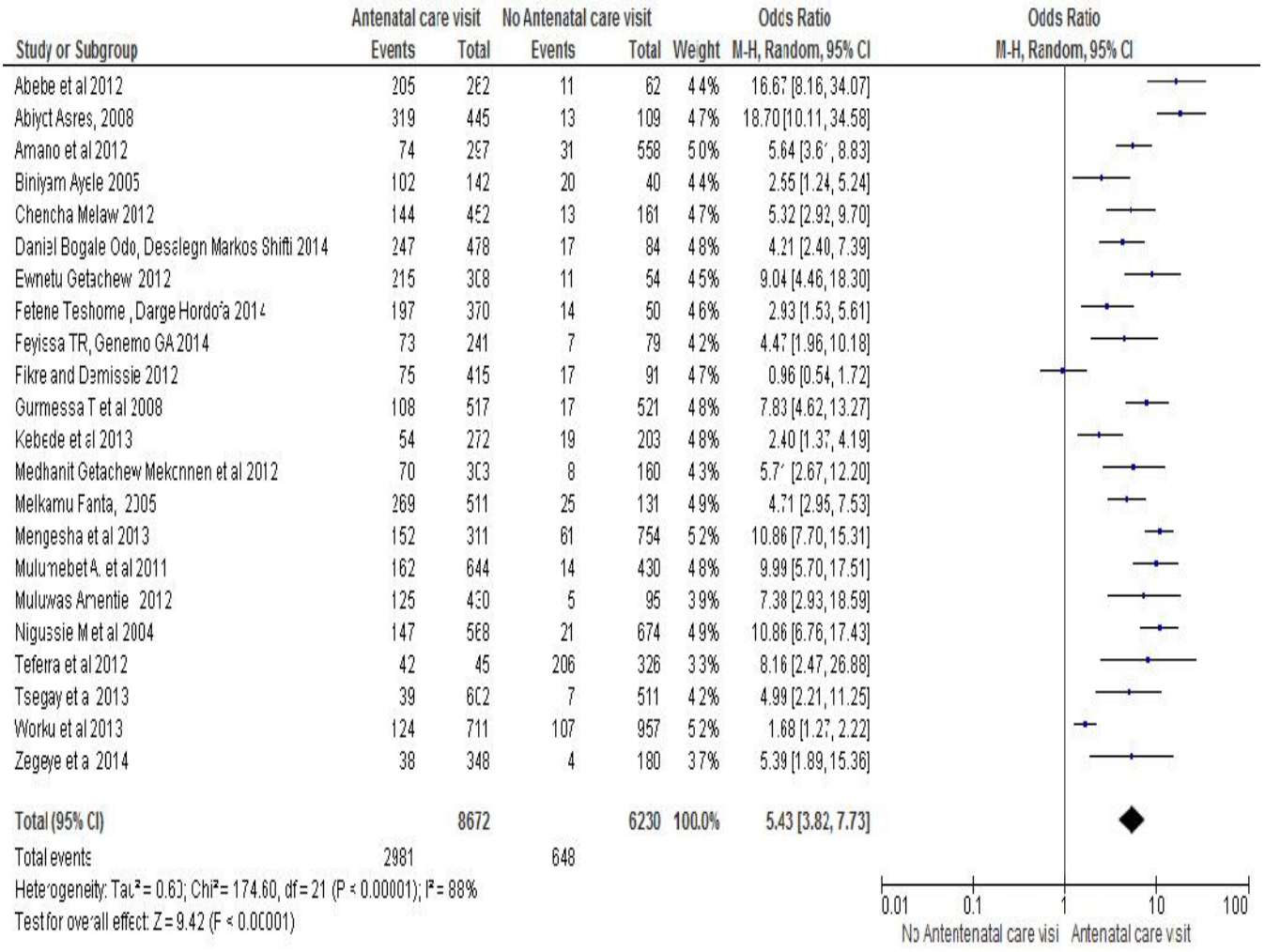

Figure 13 *Association of Antenatal care visit with institutional delivery service utilization in Ethiopia, 2000-2014*

Frequency of Antenatal care visit

Attending antenatal care as recommended by WHO was also associated with institutional delivery service utilization. Women who attended Antenatal care as recommended or four or more times were 3.2 times more likely to give birth in health facility than those women who attended antenatal care service below recommended times or less than four times [OR (95%) 3.24(2.07- 5.09]. Heterogeneity test is I^2= 92%. Thus random effect model was assumed in the analysis. Sensitivity test demonstrated stability of the overall odds ratio.

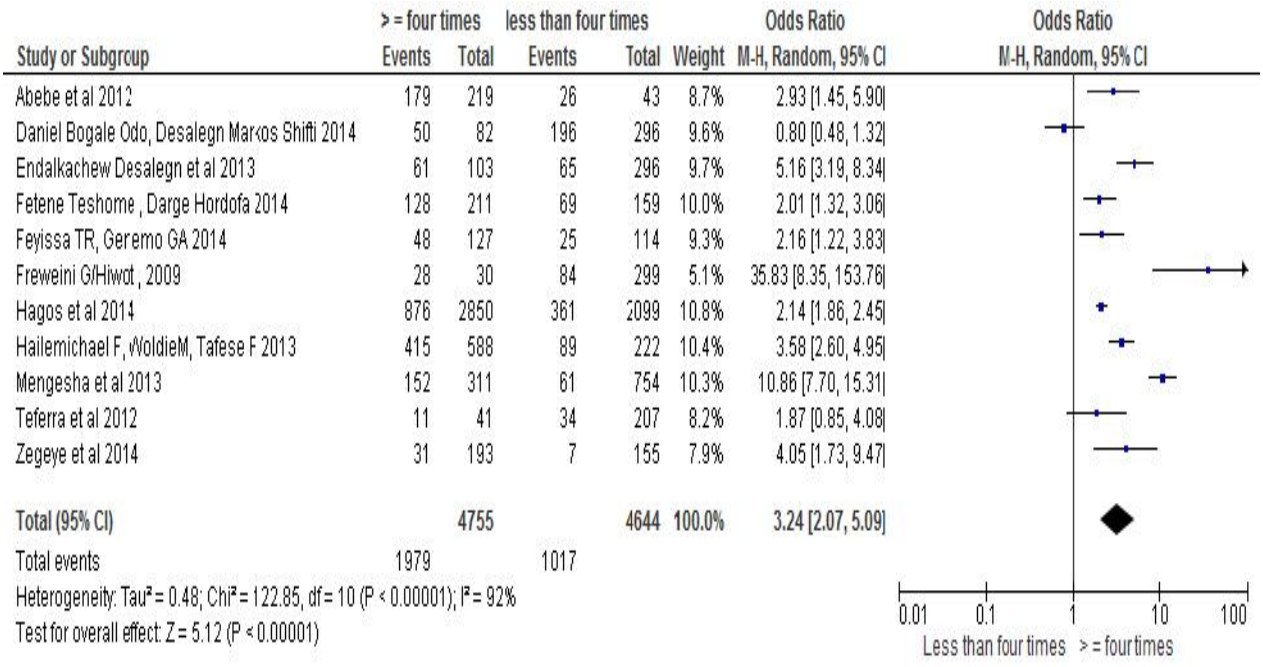

Figure 14 *Association of frequency of Antenatal care visit with institutional delivery service utilization in Ethiopia, 2000-2014*

Type of pregnancy

Type of pregnancy was another need factor that determined probability of giving birth in health facility. Those Women's planned the pregnancy were 1.5 times more likely to give birth in health facility than those women's not planned the pregnancy [OR(95%CI) 1.46(1.25- 1.71)]. Mild variability was observed among included studies (I^2= 29%). Thus fixed effect model was assumed in analysis. Sensitivity analysis was done and stability was noted in overall odds ratio.

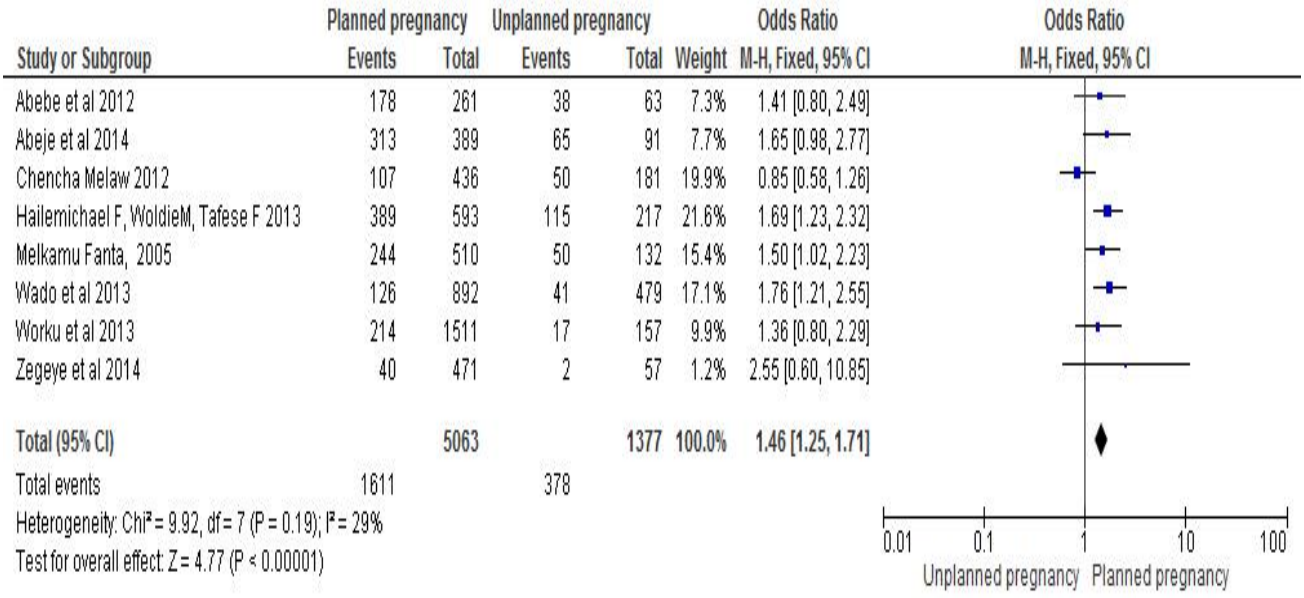

Figure 15 *Association of type of pregnancy with institutional delivery service utilization in Ethiopia, 2000-2014*

Problems during pregnancy

The finding illustrated that those women's faced problems during pregnancy were 2.8 times more likely to utilize health facility for delivery service than those women's not faced problems during pregnancy[OR(95%CI) 2.83(1.48, 5.38)].Heterogeneity test indicated I^2 = 93%, as a result random effect was assumed during analysis. Sensitivity analysis was done and illustrated stability of overall odds ratio.

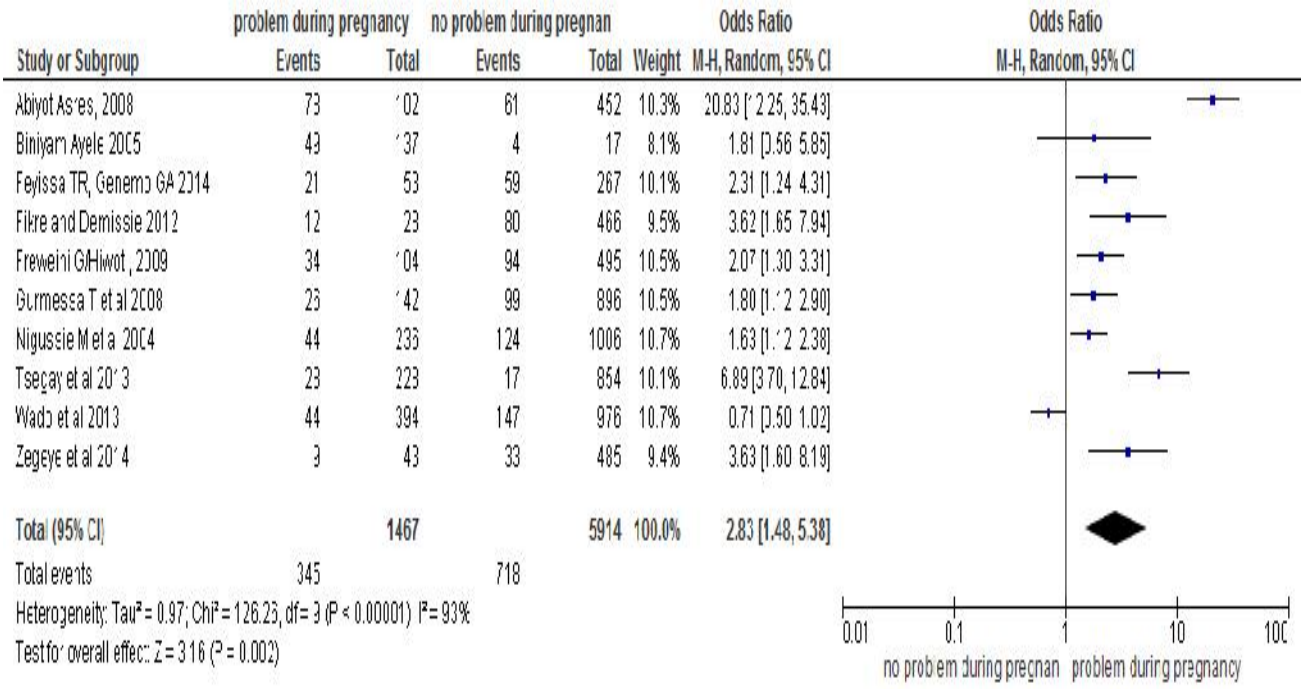

Figure 16 *Association of encountering problem with institutional delivery service utilization in Ethiopia, 2000-2014*

CHAPTER SIX: DISCUSSION

The findings of the review has revealed a valuable information which is comparable with many studies across the nation. Accordingly, determinants of institutional delivery service utilization in Ethiopia were identified. The factors were related to predisposing, Enabling and Need factors.
Level of mothers education was found one of the determinants in our review (OR=4.95). The finding is consistent with primary studies done in Pakistan and Uganda (55,56) and systematic review in SSA (57). As education makes mothers to be more concerned for their health and have more autonomy, their ability and freedom to make decisions about their own health is more favorable which eventually enhance their health seeking behavior. Education also improves the ability of educated women to afford the cost of medical health care service.

Partner's educational status also determined utilization of facility based delivery service (OR=4.43). The result is consistent with other similar studies conducted in developing countries and primary studies in India (58,59). Education leads to better health awareness, this may sensitize the family to decide and utilize health care provided at various health facilities. Therefore, husband's educational status could be favorable for timely health care seeking and economic capability required. Generally educational status of the couples has dose-response relationship with use of health facility for delivery service, increase in level of education attended increases utilization of health facility for delivery service.

Residence of the mothers was significantly associated with institutional delivery service utilization (OR=13.16). The finding was consistent with primary studies done in Uganda, Nigeria and in six selected South Asia and SSA that showed, urban/rural differences had significant associations with institutional delivery service utilization (56,60,61). This might be explained in terms of urban resident's characteristics; more proportion of educated mothers, availability health services nearby and had better access to information than rural mothers. Maternal age is also associated with institutional delivery service utilization (OR=1.77). The younger and the older women differ in their experience of the health seeking behavior. This finding was agreed with the study done in Southern Tanzania that stated delivery by skilled attendant was decrease significantly with increasing age of women ($p < 0.01$) (62). The possible explanations might be younger women are

more likely to be literate and more likely to have knowledge on benefit of health facility delivery than older women. On the other hand, older women older women consider that giving birth at home is not risky as they have previously experienced birth at home.

The finding of the review indicated that use of Antenatal care for index pregnancy increases the likelihood of delivering in the health. This finding is agreed with systematic review conducted in developing countries on antenatal care as a means of increasing birth in the health facility and reducing maternal mortality (63). This finding is also consistence with primary studies conducted in Nepal and three district of Tanzania (64,65). ANC services can provide opportunities the women's to get information on the status of their pregnancy which in turn alerts them to decide where to deliver. In addition use of ANC may signify availability of a nearby health service, which may also provide delivery care. Attending ANC as recommended by WHO were associated with institutional delivery utilization (OR=3.24). This is consistence with studies done in southern Tanzania and Rwanda (62,66). Making the recommended four or more antenatal care visits might reflect the woman's concern of her pregnancy, pregnancy complications and the need for professional help and visiting ANC frequently increasing their familiarity with medical personal which expose the women to more health education and counseling which are more likely to increase delivery service utilization.

The result of the review revealed that women with parity one were more likely to give birth at health facility than multiparous women (OR=3.05). This is consistence with study conducted in Pakistan, A meta-analysis of socio-demographic factors predicting birth in health facility conducted in developing countries and study in Philippines (55,58,67). The possible explanation for the low utilization of delivery care services among multiparous women could be because they feel more confident and perceive that there is no need for institutional delivery due to the experience and knowledge from previous pregnancies and births. Women with parity one were more motivated to deliver in health facilities, this might be due to women who are pregnant for their first child are usually more likely to fear complication during labor and delivery than women of high parity and most of the times family members including husbands encourage and accompany the women's for maternal health service for first time than for subsequent delivery. The finding of the review indicated that women those knows danger sign during pregnancy were

more likely to deliver at health facility than those who don't knows danger sign (OR=2.17). This is consistence with study done in Southern Tanzania that illustrated nearly threefold increase in skilled birth attendance when women's has knowledge about risks during pregnancy (AOR = 2.95 (95% CI 1.65–5.25) (62). The possible explanation might be, having Knowledge of danger sign during pregnancy may influence women's perceptions about their susceptibility to and the seriousness of those complications and act as an impetus to obtaining appropriate institutional delivery care. It is expected that a better informed individual were more likely to make reasonable decisions that increases utilization of delivery service that occur at health facility.

Those women's planned their pregnancy were more likely to give birth in health facility (OR=1.46). This is consistence with qualitative evidence synthesis in LMIC, that stated, lack of planning in advance for pregnancy prevented women from accessing facility delivery (68). This might be due to, Lack of planning for pregnancy results in not attending ANC, Consequently not attending ANC ends with missed opportunity for education and counseling on benefit of health facility delivery to reduce and prevent complications arise during labor and delivery that in turn increases birth in health facility. In addition, family members were less likely to encourage and accompany the women to utilize maternal health service for unplanned pregnancy. Age at first pregnancy has significant association with institutional delivery (OR=2.75). This finding is consistence with study done in Northern Nigeria, women's who had their first pregnancy before 18 years had gave birth at home ($P<0.05$) (69). This might be, teenagers (age less than 20 years) have low level of education attainment, little knowledge on benefit of health facility delivery , knowledge on danger sign during and risk of pregnancy before age 20 that make them less likely to give birth in health facility.

The result of this review shows proportion of women delivery at health facility was decrease with increasing distance from the nearest health facility. This is consistence with other similar studies systematic review in SSA and primary studies in Nepal and Zambia (57,70,71). The Possible explanation for this might be pregnant women do not try to reach a facility for delivery since walking many kilometers is difficult during labor and unavailability of transport to the facility if the labor starts at night. In this review women's autonomy is not factor associated with institutional delivery service utilization. [OR (95%CI) 0.73(0.42, 1.27)]. This finding is

inconsistence with systematic review conducted in SSA that stated, women with highest levels of Autonomy were most likely seek Facility based delivery. This might be due to, the SSA review assess power of the women in relation to other activities such as say on household purchase and freedom of movement in addition to decision on place of delivery. However in four of studies included in the Meta analysis autonomous women's are less likely to delivery in health facility (31,32,50,53). In three of the studies the probability of delivering in health facility was about 1.90-4.33 times higher among autonomous women than non-autonomous women (21,37,46,52).

Encountered problems during pregnancy were increases health institutional based delivery service (OR=2.83). This finding is agreed with study conducted in Philippines and qualitative study conducted in Indonesia (67,72). The possible explanation might be mothers who had history of problems have practical experience about the life treating conditions than those who did not, this experience could motivate the mother to give birth in health facility. In addition experiencing the problem can make women seek health services during pregnancy and health workers may then recommend health facility delivery. The finding of the review showed that owing radio or TV increases birth in health facility (OR=3.63). The possible explanation might be, having functional radio or TV may increases access to information related to maternal and neonatal health and service availability. And also mass media are effective in information dissemination which could facilitate behavioral changes that might be allowing mothers for the acceptance and utilization of maternal health service

Limitation and strength of the review

Strength

- Inclusion of grey literatures to reduce publication bias.
- The precision and accuracy of estimates can be improved as more data is used which may increase the statistical power of the study to detect an effect.
- Large sample size obtained from combination individual studies increases generalizability and representatives of the finding.

Limitation

- Due to lack or inconsistency of data grouping in the primary studies, several other quantitatively collected variables like religion, occupation of couples, Previous place of birth, monthly income, family size, time of initiation of ANC visits, age at marriage, gravidity and perceived quality of delivery service that may determine the place of delivery were not meta-analyzed.
- Small numbers of articles are used in some of meta-analysis due to inconsistence categorization in the primary studies.
- Some of the articles required purchasing to access
- In some of identified studies data required for meta-analysis were not reported.

Conclusion and Recommendation

Conclusion

Conclusions made from this systematic review were

- The systematic review identified maternal age, residence setting, educational status of couples, owing radio/TV, parity, Antenatal care visit, Frequency of ANC visit, distance from nearby health facility, type of pregnancy, age at first pregnancy, problem during pregnancy and knowledge of danger sign during pregnancy as determinants for institutional delivery service utilization
- Residence setting, Educational attainment, Parity, Antenatal care visit, frequency of Antenatal care visit, possession of Radio/TV, Distance to health facility and problems during pregnancy were factors positively and significantly associated with institutional delivery service utilization.
- Women's autonomy were not associated with institutional delivery service utilization

Recommendations for different stakeholders (FMOH, ORHB, MOE, NGOs)

- Promoting couples education, beyond the primary school
- Promotion of antenatal care visits and the completion of four standard visits by pregnant women
- Strengthening provision of health information to the community regarding danger sign during pregnancy, risk of high parity and pregnancy before age 20 & benefit of institutional delivery
- Health education should be given to all pregnant women's, emphasis should give to uneducated and rural mothers at community level using the available communication networks like health developments army and health extension workers in the rural communities

For researcher's

- Further qualitative primary studies for sociocultural related factors to guide future qualitative synthesis.

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ANNEXS

Appendix I JBI Critical appraisal tools

JBI Critical Appraisal Checklist for Comparable Cohort/ Case Control

Reviewer _____ Date _____
Author _____ Year _____ Record Number _____

	Yes	No	Unclear
1. Is sample representative of patients in the population as a whole?	☐	☐	☐
2. Are the patients at a similar point in the course of their condition/illness?	☐	☐	☐
3. Has bias been minimised in relation to selection of cases and of controls?	☐	☐	☐
4. Are confounding factors identified and strategies to deal with them stated?	☐	☐	☐
5. Are outcomes assessed using objective criteria?	☐	☐	☐
6. Was follow up carried out over a sufficient time period?	☐	☐	☐
7. Were the outcomes of people who withdrew described and included in the analysis?	☐	☐	☐
8. Were outcomes measured in a reliable way?	☐	☐	☐
9. Was appropriate statistical analysis used?	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

JBI Critical Appraisal Checklist for Descriptive / Case Series

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

	Yes	No	Unclear	Not Applicable
1. Was study based on a random or pseudo-random sample?	☐	☐	☐	☐
2. Were the criteria for inclusion in the sample clearly defined?	☐	☐	☐	☐
3. Were confounding factors identified and strategies to deal with them stated?	☐	☐	☐	☐
4. Were outcomes assessed using objective criteria?	☐	☐	☐	☐
5. If comparisons are being made, was there sufficient descriptions of the groups?	☐	☐	☐	☐
6. Was follow up carried out over a sufficient time period?	☐	☐	☐	☐
7. Were the outcomes of people who withdrew described and included in the analysis?	☐	☐	☐	☐
8. Were outcomes measured in a reliable way?	☐	☐	☐	☐
9. Was appropriate statistical analysis used?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

JBI Data Extraction Form for Experimental / Observational Studies

Reviewer _____ Date _____

Author _____ Year _____

Journal _____ Record Number _____

Study Method

RCT	☐	Quasi-RCT	☐	Longitudinal	☐
Retrospective	☐	Observational	☐	Other	☐

Participants

Setting

Population

Sample size

Group A _____ Group B _____

Interventions

Intervention A

Intervention B

Authors Conclusions:

Reviewers Conclusions: