

## FACTORS INFLUENCING ANTENATAL CARE UTILIZATION IN ETHIOPIA: A SYSTEMATIC REVIEW

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### ABSTRACT

### BACKGROUND

Maternal death is a major public health problem in Ethiopia. Antenatal care (ANC) utilization is believed to promote the uptake of obstetric care services and hence improve maternal health. But ANC coverage is low and reviews on determinants of utilization are lacking in Ethiopia.

### OBJECTIVE

Synthesize evidence on factors influencing ANC utilization in Ethiopia.

### METHODOLOGY

Relevant articles were searched electronically, filtered and quality assessed. Factors were categorized using a conceptual framework adapted from Anderson's model and bio-behavioural modelling in health care utilization.

### RESULTS

Twenty-five studies were reviewed. Maternal education, place of residence, family income, husband's approval, media exposure, pregnancy intention and previous bad obstetric history were the major individual factors affecting ANC utilization. The only health service factor was distance of a health facility. Most of the studies lack standardized outcome measures which could differentiate between non-use versus inadequate use of ANC. Only a single study used conceptual framework. Other important individual factors such as women's autonomy, cultural beliefs, social networks and health facility factors such as quality, waiting time, and service fee were not examined. No study identified consumer satisfaction as a factor affecting ANC use.

### CONCLUSIONS AND RECOMMENDATIONS

Comprehensive data on factors influencing ANC utilization is lacking in Ethiopia. The measurement of ANC utilization should be standardized and factors should be segregated into those influencing initiation versus adequate use of ANC. Programs intended to improve ANC utilization should focus on women's education; promote planned pregnancy; target the underprivileged and expand their scope to involve partners in ANC provision.

**KEY WORDS:** antenatal care, prenatal care, utilization, maternal health, factors, systematic review, Ethiopia

## INTRODUCTION

Maternal death is major public health problem in Ethiopia. The maternal mortality ratio-412/100,000 live births- is among the highest in the world<sup>1</sup>. Antenatal care (ANC) is one of the strategies to promote the uptake of obstetric care services and improve maternal health. ANC with its inherent principles of health promotion & disease prevention is even more crucial in developing countries where management of obstetric complications is challenging because of late presentation of patients and health facility constraints.

There are few systematic reviews done on factors affecting ANC utilization in developing countries. The available studies indicate that the predominant factors vary in different contexts<sup>2</sup>. Hence context specific reviews are important for appropriate policy and program recommendations.

Generally, there is significant unmet need for maternal health care in Ethiopia and numerous studies reported low ANC utilization. The most recent EDHS (2016) reported ANC coverage of 62%<sup>2</sup>. Although there are numerous studies addressing determinants of ANC utilization; to the best of our knowledge there are no systematic reviews in Ethiopia.

Research evidences of utilization tailored to a geographic context are central to guide efforts focused on improving the uptake and quality of prenatal care. Understanding which factors are most important to ANC utilization will help in devising evidence based effective policies and interventions. It will also guide health organizations to target specific/underprivileged groups and improve quality of services. This will ultimately lead to the achievement of the goals of ANC and ensure customer satisfaction.

In light of the above facts, a review of the literature on factors influencing the utilization of ANC in Ethiopia was done with the objectives of identifying context specific factors which will help to devise effective policies/interventions and point out the existing knowledge gap.

## MATERIALS AND METHODS

Search strategy and Information sources (Figure 1): Search was done between May to July 2014 (updated in Jan 2016). The following categories of terms (i.e. terms related to utilization/access

with those related to maternal/antenatal services) in different combinations were used: antenatal/prenatal care; maternal health care; utilization; accessibility factors/determinants; inequalities; service quality; Ethiopia.

MEDLINE (PubMed interface), EMBASE (OVID interface) and GOOGLE scholar databases were browsed by developing search strategies specific to their medical subject headings and text words. Grey literature, the national DHS and the websites of organizations working on maternal health in Ethiopia were also searched. Additionally, contact was made with study authors to identify additional articles. Retrieved information was collected in a pre-prepared format. Hand searching for library catalogs was not done because of time & facility constraints.

Eligibility criteria/filters for bibliographic search: Publication date: from 1990 to 2014; Publication language: English; Setting: Ethiopia. Research design: both qualitative and quantitative studies. Recent methodological debate has highlighted the advantages of integrating both in systematic reviews<sup>[2]</sup>. Use of qualitative or quantitative research alone might exclude relevant factors or might result in inappropriate judgments about their relative importance<sup>2</sup>. Contributions from both research designs are required to underpin the formation of evidence-based healthcare policy<sup>2</sup>. Quality assessment: There was no single quality assessment tool used. But the following important elements from Center for Reviews and Dissemination (CRD's) Guidance for study quality assessment by Khan et al<sup>3</sup> were used to assess methodological quality of the papers:

(a) Relevance to the review - Excluded those with main focus on another topic; focus on emergency health care seeking than preventive

(b) Validity and appropriateness of methodology - Studies with Defined outcome measures, comparison groups, and appropriate sample selection were included

(c) Quality of evidence - generalizability - Data from specific groups (e.g. teenage pregnancy); limitations of the study and the issue of confounding and how it was adjusted

Outcome measures: Four outcome measures were used by the studies in different combinations (Table 2). ANC use/visit as the single outcome measure was used in 19 studies and it was defined variably as any number of ANC attendances. A single study used rigorously defined outcome measure in which ANC use was considered only if the recommended four visits were attended<sup>19</sup>.

Only a single study used a combination of two outcome measures (any ANC attendance and adequate use). Receiving four or more visits was considered as adequate<sup>10</sup>. Four studies, focused exclusively on early initiation of ANC, used timing of the 1<sup>st</sup> ANC visit as the single outcome measure<sup>11,12,13,14</sup>. Early ANC attendance was defined as first visit before 12 weeks of gestation.

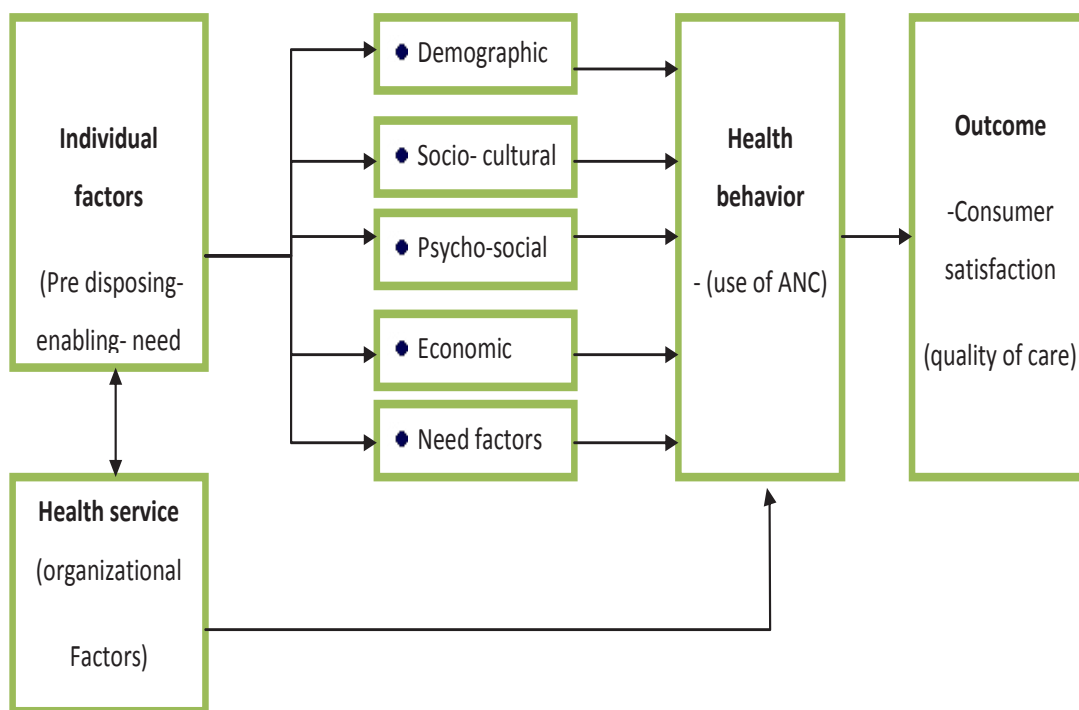


Figure 2: Conceptual frame work used for data synthesis in the review

Individual (population, demographic) factors affecting ANC services utilization: The major demographic factor associated consistently with ANC utilization was place of residence in 6 studies<sup>7,8,9,13,15,16</sup> in which rural residence was significantly associated with non-use of ANC. According to DHS 2000<sup>7</sup> and the study of inequalities in ANC utilization comparing all the three Ethiopian DHS surveys<sup>8</sup>; women in urban areas were more likely to use ANC from a healthcare provider than rural women.

But conflicting findings were reported for age and marital status. While young were less likely to utilize ANC in 4 studies<sup>17,18,19,20</sup> non-use of ANC was more likely in older women (>30yrs) in the other three studies<sup>16,21,24</sup>. Four studies reported married women were more likely to utilize ANC compared to single/divorced women<sup>7,21,22,23</sup> while in the other 3 studies married women were less likely to use ANC<sup>19,24,25</sup>.

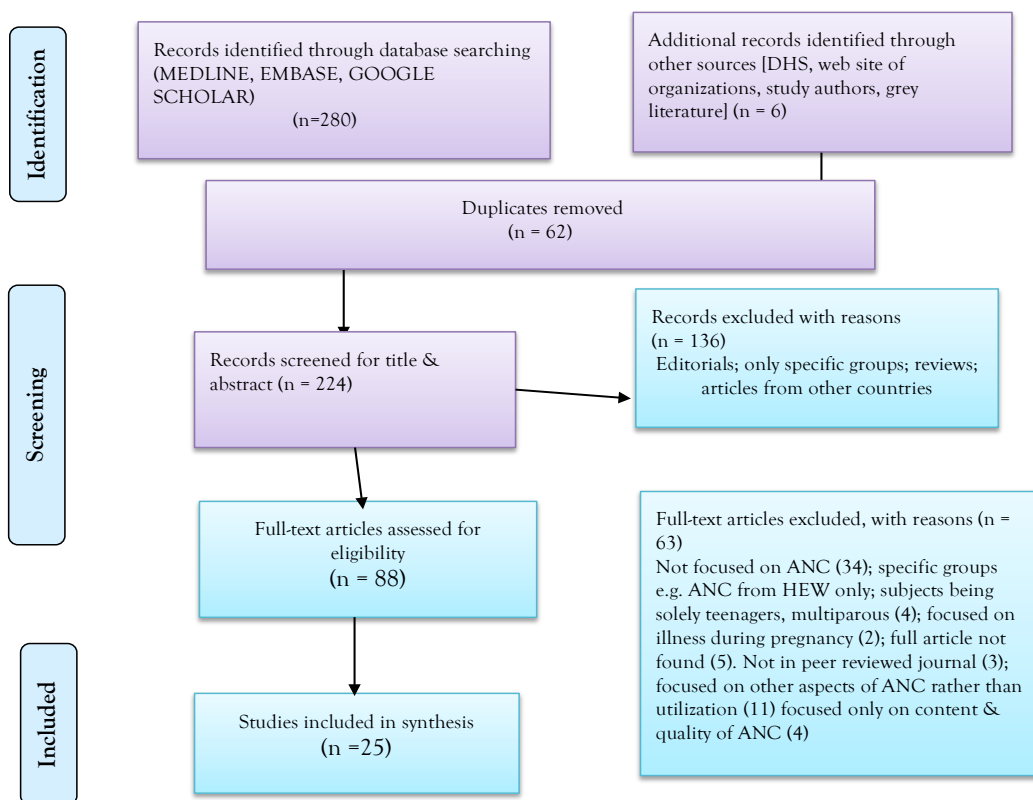


Figure 1: the PRISMA flow diagram for identification of articles

Search outcome: As shown in the 4 phase PRISMA flow diagram for reporting systematic reviews (Figure1); a total of 280 articles were retrieved and of those only 25 were eventually found to be relevant for this synthesis based on inclusion criteria and study quality assessment.

Conceptual frame work for data synthesis: The purpose of this framework is to identify and categorize factors affecting ANC utilization into explanatory themes which will also help in making meaningful recommendations for policy and program interventions.

The most widely used Anderson's model is deemed unsuitable for reviews and is mainly suggested for longitudinal and experimental studies<sup>4</sup>. In a recent review, the Anderson's model, has been found to have important limitations such as overlapping of factors in the predisposing /enabling/need categories; poor generalization and production of results; difficulty in practical interpretation of findings and recommendations for policy & intervention<sup>5,6</sup>. Hence, a modified conceptual

framework is developed for this synthesis (Figure2). It has incorporated both factors at

different levels of HC utilization as well as categories derived from the 5 major approaches used for behavioral modeling of health service utilization without changing the basic concepts in the original Anderson's model.

A narrative synthesis was undertaken, since a quantitative synthesis was not possible due to heterogeneity of research designs and different outcome measures used by the studies.

## RESULTS

Characteristics (description) of the studies: Table-1 (supplementary file) shows an overview of the articles included. Of the 25 studies, 19 were quantitative and 6 used mixed quantitative and qualitative methods. Two studies were based on secondary data analysis from Ethiopian demographic health survey. All the rest were primary studies. The studies were conducted in various regions of Ethiopia.

Table 2: variations in the main outcome measures utilized by the studies

Outcome Measure	List of referenced Studies
ANC Use (use or non-use) Any attendance of ANC	7, 8,10, 15, 16, 17, 18,19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,31
Timing of 1st visit Early (1st visit ≤12wks)	11, 12, 13, 14
Number of visits recommended # of visits (≥4 defined FANC use)	9
Adequacy of care -adequate (≥4) and non-adequate care (1-3 visits)	10

Socio-cultural/ (Social structure) Factors such as literacy, occupation, ethnicity, husband's approval of ANC, religion, husband's occupation were factors to be associated significantly with ANC utilization. Most (18) studies identified women's education as

powerful predictor of ANC attendance (Table 3). Moreover, Women with better education (primary/secondary) were more likely to initiate ANC visits earlier<sup>13</sup> and receive adequate care<sup>10</sup> compared to less educated women.

Table 3: factors significantly affecting ANC utilization in Ethiopia stratified according to the conceptual framework

Category	Number of studies	References
<b>DEMOGRAPHIC</b>		
Residency	6	[7, 8, 9, 13, 15, 16,]
Age	7	[16 - 19, 20, 21, 24,]
Marital status	7	[7, 9, 21-25]
<b>SOCIAL STRUCTURE (SOCIO-CULTURAL)</b>		
31] Education	18	[7, 8, 10, 13, 15 - 18, 21 - 29,
Occupation	6	[20, 21, 24 - 27]
Husband's approval	4	[17, 18, 19, 28,]
Family size	2	[18, 27]
Woman's autonomy	2	[20, 29]
Husbands education	2	[15, 25]
Husband's occupation	2	[22, 25]
Ethnicity	2	[24, 28]
Culture	1	[7]
Religion	2	[7, 24]
<b>PSYCHO-SOCIAL (HEALTH BELIEF)</b>		
Knowledge of ANC	4	[14, 15, 21, 26]
Attitude towards pregnancy	2	[17, 21].....
<b>INDIVIDUAL</b>		
Perception towards ANC	1	[26]
<b>FACTORS</b>		
Lack of time	1	[21]
Perceived benefit	1	[26]

Knowledge of Danger signs	1	[17]
<b>ECONOMIC</b>		
Family income	9	[7, 12, 15, 17, 19, 21, 23, 24, 29]
Wealth index	2	[8, 10]
<b>NEED FACTORS</b>		
Parity	8	[7, 10, 11, 14, 20, 21, 24, 27]
Previous use	3	[11, 20, 28]
Timing of pregnancy recognition	2	[10, 13]
Pregnancy intention	9	[10 - 14, 20, 21, 28, 29]
Advice on recommended visit	2	[11, 12,]
Media exposure	5	[9, 15, 17, 25, 27]
Perceived morbidity	1	[9]
Perceived need	6	[9, 13, 16 20, 21, 29]
(Previous abortion, preterm )	1	[31]
<b>AVAILABILITY</b>		
ACCESSIBILITY	5	
HEALTH * Travel time	3	[9, 10, 31]
SERVICE * Distance	2	[22, 30]
<b>FACTORS:</b>		
EXPERTISE (PERCEIVED QUALITY)	3	[16, 21, 25]
WAITING TIME	2	[21, 25]

Women's occupation of being students and farmers was associated with better utilization of prenatal care compared to house wives in 2 studies<sup>24,25</sup>. But students and house maids were less likely to utilize ANC in the other 2 studies<sup>21,26</sup>. Employed women were also more likely to use ANC compared to unemployed women<sup>20,27</sup>. Paternal characteristics influencing ANC utilization were addressed in limited studies. Two studies indicated that maternal use of ANC was higher in those mothers with husband's occupation of being government employee and non-farmer<sup>22,25</sup>. Four studies found husband's positive attitude and/or approval of ANC favorably affects ANC attendance<sup>17,18,19,28</sup>. Husbands' formal education (of being secondary and above) as a factor increasing the likely of ANC utilization was reported in 2 studies<sup>15,25</sup>.

The role of Ethnicity on ANC utilization is not clear as the only two studies reported conflicting results. While being Amhara was found to be predictor of better utilization in a

study by Belay T. Biratu et.al<sup>28</sup>; no association was found in the other study done in Jimma town<sup>24</sup>.

Two studies reported religion as a factor affecting ANC utilization<sup>7,24</sup>. According EDHS 2000; Muslims in rural areas were nearly one and a half times more likely to use antenatal services compared to Orthodox/Catholic women<sup>7</sup>. But the underlying reasons behind this difference were not explained. Two studies reported the effect of family size on ANC attendance where large family size (>3) was significantly associated with non-use of ANC compared to smaller size<sup>27,18</sup>. Decision making power (autonomy) of women was favorably associated with utilization of ANC services in 2 recent studies<sup>20,29</sup>. A single study reported women with traditional belief were less likely to use prenatal services compared to any other religious group<sup>7</sup>. Economic factors: Monthly family income in 9 studies<sup>7, 12, 15, 17, 19, 21, 23, 24, 29</sup> and household wealth indices in 2 national surveys<sup>8, 10</sup> were significantly associated with both ANC Utilization and timely initiation. In

all studies, families with low monthly income (<500-1000birr/month) and/or low household wealth index were less likely to attend ANC. Psycho-social/ (Health belief) factors: Limited studies identified psycho-social factors affecting ANC utilization. Lack of knowledge about ANC in 4 studies<sup>14, 15, 21, 26</sup>, negative attitude towards importance of ANC in one study<sup>26</sup>; negative attitudes pregnancy in 2 studies<sup>17, 21</sup> and lack of time in one<sup>21</sup> were associated with non-use of ANC. Poor knowledge on early ANC was also a predictor of late Initiation of prenatal care<sup>14</sup>.

**Need Factors:** Need characteristics are conditions that patients or health providers recognize as requiring medical treatment<sup>15</sup>. Pregnancy intention was consistently identified as factor affecting ANC utilization in which planned/intended pregnancy is positively associated with ANC attendance in 9 studies<sup>10 - 14, 20, 21, 28, 29</sup>. Planned pregnancy was also powerful predictor of early attendance in all the 4 studies that focused on timely initiation of ANC<sup>11-14</sup> as well as receiving adequate care<sup>11</sup>. Eight studies reported association between parity and ANC utilization with conflicting results<sup>7, 10, 11, 14, 20, 21, 24, 27</sup>. Higher parity was barrier to the use of ANC in most (5) studies<sup>10, 11, 21, 24, 27</sup> while a single study showed parity > 3 in rural mothers is associated with ANC use<sup>20</sup>. Importantly, Digsu and Alemayehu found that nullipara women were more likely to initiate ANC use earlier compared to multiparous women<sup>11, 14</sup>. The secondary data analysis from EDHS (2000) by Mekonnen & Mekonnen found dual association in which multiparous women tended to use ANC service more often (1.2x) than primiparous women in urban areas while the reverse was true in rural areas<sup>7</sup>. Five studies showed media exposure significantly favored ANC utilization<sup>9, 15, 17, 18, 25</sup>. Women with any and/or frequent exposure to media were more likely to receive ANC compared to those who reported no exposure at all.

There were conflicting findings on the effect of previous ANC use on the current use. It was positively associated with ANC attendance in two studies<sup>20, 28</sup>, but not in the other one<sup>11</sup>.

Perceived need is how people view and experience their own general health, functional state and illness symptoms<sup>5</sup>. Previous bad obstetric history (abortion, still birth, preterm)

was one of the important factors favouring ANC utilization in 6 studies<sup>9, 13, 16, 20, 21, 29</sup>. A study in Jimma town by Wegene found previous history of preterm birth was significant predictor of early ANC use.<sup>113</sup> Individuals who thought that they might develop dangerous health problems during pregnancy were more likely to use focused ANC<sup>9</sup>.

Delayed pregnancy recognition was associated with both late initiation of ANC<sup>113</sup> and receiving inadequate care (Less than 4 visits)<sup>11</sup>. Failure to get advice on timing of 1<sup>st</sup> visit significantly increased the likely of late ANC attendance in two studies<sup>11, 12</sup>.

**Health service (organizational) factors affecting ANC utilization:** Accessibility -Five studies identified accessibility as one of the major factors affecting ANC utilization. Distance of HC from patients' home of 10km in 2 studies<sup>22, 30</sup> and more than 1hr travel to a health facility in three studies<sup>9, 10, 31</sup> were associated with low utilization of ANC.

**Availability** - In a single study by Muluwas et al. the availability of traditional birth attendants was reported as factor favoring ANC utilization<sup>31</sup>.

**Health providers' characteristics:** Perceived quality of care affecting ANC utilization was identified in 3 studies where reported good skill of health provider<sup>25</sup> and good perception of women to the quality services<sup>16, 21</sup> were associated with better use of ANC.

**Waiting/working time:** In 2 studies done by Tesfaye and Gebi in East Wollega, and Mengisti in Arsi zone, longer waiting time at health institutions was associated non-use of prenatal care<sup>21, 25</sup>. But the influence of working time was not assessed in any of the studies.

## DISCUSSION

Maternal education, income, place of residence, husband's attitude/approval knowledge of the importance ANC, media exposure, pregnancy intention; perceived need and accessibility of health facilities were the major independent predictors of ANC utilization in Ethiopia. But other important individual factors including women's autonomy, social networks, and cultural beliefs; health service factors such as

working hours, provider characteristics, client-provider interaction, user fee charges, perceived quality of care were not well studied as well as consumer satisfaction.

The findings are in agreement with the systematic review of ANC use in developing countries by Simkahada et al<sup>2</sup> except that some of the need factors (perceived need, and pregnancy intention) were unique determinants in our review while marital status, women's employment and cost were identified as independent predictors in that review.

The major demographic factor influencing ANC use was rural residence. Women in rural area will need to travel long distance to access health facilities and usually there are no adequate trained ANC providers. The poor condition and seasonal nature of rural roads and lack of transportation could also be contributing factors.

The most consistent predictor of ANC use in this review was maternal education (18 studies). It is widely believed that educated women have better autonomy and decision-making power relating to house hold and social matters which will give them the freedom to make independent decision on their own and attend health care facilities when necessary. Literacy also increases women's exposure to media and other sources of maternal healthcare services which increase their health seeking behavior.

The most prominent paternal characteristic affecting ANC use by pregnant mothers was husbands' attitude/approval. It was found out that husband's approval had a greater effect on prenatal care utilization than whether a wife wanted the pregnancy or a wife's level of education<sup>28</sup>. This is especially relevant in the Ethiopian context where male partners hold predominant decision-making power in household/community matters. Hence involving partners in ANC provision might increase the uptake of ANC services by pregnant mothers. There are limited evidences on the influence of Women's autonomy on ANC use in this review. Generally, women's autonomy was found to be associated with better maternal health seeking behavior in a secondary data analysis from the 2005 Ethiopian DHS<sup>33</sup> and 2 other cross sectional studies<sup>20, 29</sup>. Women with better autonomy are more likely to have better position in house

hold decision making and more financial freedom for health care expenditure. Income affects ANC attendance in many (8) of the studies. Better off families have the financial freedom of spending for health care and they will also have a better access to sources of information on maternal care. The decision of low income families will be influenced by anticipated expenses for transportation, ANC services and medications.

Family size influencing ANC use was identified by 2 studies. It was evident that in most developing countries, women with big family size spend most of their time on house hold activities which will jeopardize awareness to own health<sup>2</sup>. Culture (values, practices, meanings, and beliefs which are transmitted from one person to another) is addressed only in a single study<sup>7</sup>. In developing countries, the use of maternal health services is significantly affected by cultural beliefs and values that shape the way individuals perceive their health and available healthcare services<sup>2</sup>. This is even more crucial in Ethiopia where there are diverse ethnic groups with wide cultural differences.

The role of social networks, which are important determinants of health care utilization, was not explored in any of the studies. Individuals may consult social networks for health care advice. Social networks can provide an impetus for health care utilization but may also press an individual to abstain from accessing health services<sup>32</sup>.

The role of parity and the direction of association were not clear. Generally high parity was barrier to the use of ANC. Low utilization of ANC among parous women could be ascribed to lack of time, limited resources in the family, and bad experience from previous utilization. Pregnancy intension was the most powerful need characteristic affecting ANC use, particularly early attendance. This was also evidenced in a meta-analysis in which increased odds of delayed/inadequate use was seen in unintended pregnancies<sup>34</sup>. It is believed that those women with wanted/planned pregnancy are more likely to be ready psychological/economically for the necessity of attending maternal health facilities. Wanted pregnancies are also more likely to get support from families and social networks.



Women experiencing bad obstetric outcome in previous pregnancies (perceived need) are more likely to realize the importance of attending ANC services in the current pregnancy with a belief that they will have favorable pregnancy outcome. Media exposure provides women with the opportunity to obtain information and advice on the importance and necessity of ANC during pregnancy. This has been confirmed also in previous reviews both in developing and developed countries<sup>2</sup>.

The major Health organization factor affecting ANC utilization was accessibility. Transportation to distant facilities may discourage women because of both the time taken and costs involved. Unlike reviews in developed and some developing countries, health insurance coverage was not identified in any of the articles. But user fee charges were found to affect maternal health care utilization in Ethiopia<sup>35</sup>. Other health facility factors including provider characteristics, socio-cultural sensitivity of service provision and communication barriers were not addressed. None of the studies addressed consumer satisfaction affecting ANC utilization. But a study of quality of ANC services in public facilities in Bahir Dar showed almost half were not satisfied with the care given<sup>36</sup>.

The updated Anderson's model of health care utilization includes recognition that consumer satisfaction reflects health care use. De-satisfaction with care provision could be a significant barrier to ANC utilization<sup>2</sup>. Limitations of the studies: Most of the studies lack clearly defined (standardized) outcome measures. Hence it is impossible to delineate the factors that predominantly affect nonuse verses inadequate use. Most studies used at least a single maternal facility visit during pregnancy to be sufficient to define ANC utilization. But a single study defined ANC use only when all the recommended 4 visits were attended<sup>9</sup>. The use of at least one visit to define ANC utilization might exaggerate estimates of ANC utilization which might be misleading to efforts targeting improvement in access to ANC. Only a single study used conceptual framework. Hence, the pathways through which the identified factors influenced ANC utilization are not explained which would have made the recommendations scientific and would have given clear guidance for designing interventions that will improve

ANC use.

It was not also clear if the studies differentiated ANC utilization for preventive/(routine) verses for health problems during pregnancy. This is important as factors affecting attendance for preventive services might be different from those affecting attendance for curative services.

Factors affecting initiation of ANC visit verses continued visits(recommended)visits were not segregated in the studies. According to the revised Anderson's model, whether or not a specific health service is utilized and the frequency it is utilized will have different determinants based on characteristics of the population and the health services<sup>32</sup>.

Very few studies segregated factors in to those affecting ANC use in rural compared to urban residents. Considering the various contextual factors including cultural beliefs, values, attitudes towards health care, social networks which could be different in the two, future studies addressing the issue are recommended. Indices for Adequacy of utilization were never used by any of the studies. Since adequacy of care considers both initiation of care and service received, it has implications for interventions targeting factors influencing ANC utilization both at individual and health facility level.

The mere recommendation of women receiving a defined number of ANC visits does not necessarily ensure the uptake of adequate care. Hence future Qualitative studies addressing the uptake of all ANC services including the content /quality of ANC and associated factors are recommended.

## CONCLUSIONS

Comprehensive data on factors affecting ANC utilization in Ethiopia are lacking. Most of the studies lack clearly defined/standardized outcome measures and the pathways through which the identified factors influenced ANC utilization were not explained which would have given clear guidance for designing targeted interventions. Determinants of ANC use(initiation) verses adequate use were not segregated which have policy and program implications as the mere recommendation of attending a defined number of ANC visits does not ensure uptake of adequate care.

It is recommended that women's education and planned pregnancy should be given high priority in interventions intended to improve ANC utilization. The scope of ANC should expand to involve husbands so as to promote uptake of prenatal services. Policies/programs should focus on the reported inequalities

and devise strategies to ensure accessibility of services to the underprivileged. Identification of all individual and health organization factors affecting ANC utilization including consumer satisfaction is imperative as well as the segregation of determinants of ANC initiation verses continued use/adequate care.

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