Pharma Multidisciplinary Research Journal (PMRJ) **Open Access**
2024, Volume 1, Issue 1 **ISSN online: 3006-2896**
https://pmrj.epua.online/index.php/pmrj

Original Article

Male Partners' Involvement during Antenatal Visit and Its Associated Factors among Pregnant Women Attending Hawassa City Public Health Facilities, Hawassa, Sidama Region, Ethiopia

Kebede Tefera Betru[1*], Selamawit Birhanu[2]

[1]Hawassa University, College of Medicine and Health Sciences, School of Public Health, Hawassa, Sidama Region, Ethiopia

[2]Millennium Health Center, Hawassa City, Sidama Region, Ethiopia

*Correspondence Author: Kebede Tefera Betru; ktefera2015@gmail.com

Abstract

Background: Male partner's involvement in antenatal care is important to minimize delays in decisions to seek antenatal care. Despite improved accessibility, delays in pregnant women seeking their first ANC remain a challenge. This study was aimed to assess male partner involvement during utilization of antenatal care and its associated factors among pregnant women attending Hawassa City public health facilities.

Methods: An institution based cross-sectional study was employed in Hawassa City public health facilities from July 1-30, 2022. Systematic random sampling techniques were used for recruitment 406 participants. Data were collected using structured pretested questionnaires by interview administered technique. Data collected via interviews and analyzed in SPSS, employing logistic regression to assess factors influencing male involvement. Results, with a significance level of $p < 0.05$, were presented through tables, figures, and text, including crude and adjusted odds ratios.

Result: 406 respondents were participated in the study giving response rate of 96%. The mean (±SD) age of participants was 24.35± 4.5 years. The overall prevalence of male partner involvement antenatal care visit was 70.4% with 95 % confidence interval (65.99, 74.90). Planed pregnancy AOR 2.9 [95% CI (1.4, 6.1)] and health worker cooperation AOR 3.4 [95% CI (1.8, 6.3)] predict the involvement of male partner during antenatal care service utilization.

Conclusion: Male partner involvement in antenatal care visit is high in Hawassa City public health facilities. Factors like planned pregnancy and health worker cooperation contribute to the outcome. Stakeholders should actively educate men about the importance of their involvement in antenatal care to enhance participation.

Keywords: Male Partners Involvement, Antenatal Care, Hawassa City, Maternal Health

Introduction

Pregnancy complications present a critical global public health issue, especially in low- and middle-income countries, with an estimated 303,000 maternal deaths annually (1). Sub-Saharan Africa alone accounts for 44% of these deaths (1,2). Millennium Development Goals and Sustainable Development Goals have prioritized maternal and child health globally (1). The World Health Organization (WHO) advocates for focused Antenatal Care (ANC), highlighting male involvement (3,4). ANC, spanning conception to childbirth, aids in accessing healthcare and preparing for a healthy pregnancy and postpartum period (5,6). Timely ANC is vital for reducing maternal mortality (5). Ethiopia, with a high maternal mortality ratio of 412 per 100,000 live births, aims to end preventable deaths (7,8). Male involvement in ANC yields positive outcomes, including reduced delays in seeking healthcare and improved facility utilization (9-11). Early ANC initiation is crucial, yet often delayed (12). Pregnant women untreated for syphilis face high risks, stressing early ANC initiation. Iron supplementation and vaccines, like Tetanus Toxoid (TT), if started early, can notably reduce maternal and infant mortality (13). Male partner engagement in ANC is crucial to expedite decision-making on antenatal care (14,15). WHO's 2016 ANC model replaces "visit" with "contact," underlining active relationships between expectant mothers and healthcare providers. Achieving the recommended "contact" requires substantial male support, especially in countries like Ethiopia with limited male ANC involvement (16,17). WHO advocates for male involvement due to their significant influence on maternal healthcare decisions in countries with poor maternal and child health indicators (18,19).

Studies indicate that women whose partners attend at least one ANC session are more likely to initiate care early, attend multiple sessions, complete screenings, and receive counseling about complications (20). Engaging men in ANC is crucial for reducing maternal morbidity and mortality, preparing them for birth, and avoiding care delays (4,21). Programs targeting young couples, especially husbands of adolescent mothers, promote early formal ANC (22). Encouraging male involvement aligns with global efforts to achieve the third SDG's target of 70 maternal deaths per 100,000 live births (16). However, globally, male partner participation in skilled ANC and delivery care remains challenging (23). Sub-Saharan

African women often forgo maternity services due to lack of husband support (24).In Ethiopia, maternal health services face challenges with low attendance rates for ANC visits (32%), skilled delivery (28%), and timely postnatal care (17%) (25). Early ANC visits are notably low (24%) in low-income countries compared to developed ones (81.9%) (10). Despite improvements, delays in initiating ANC persist, with 67.6% not returning for their first appointment (5). Male partner involvement during ANC can enhance institutional deliveries and postnatal care, yet cultural norms and health system factors hinder this participation (26). Addressing these challenges is crucial for improving maternal healthcare in Ethiopia.

Sociocultural norms and taboos hinder male partner engagement in ANC, causing discomfort (27). Male involvement influences delays in seeking healthcare, common in underdeveloped nations, as women often delay care due to underestimation and dependence on partners' agreement (28, 29). In Africa, limited male involvement exacerbates maternal morbidity and mortality, with men dictating women's healthcare-seeking behaviors (29-31). Despite service accessibility advancements, male involvement in ANC remains a challenge in Ethiopia, with scarce literature on the issue (37). Globally, limited male participation hampers maternal health improvements, notably in Sub-Saharan Africa and Ethiopia (23-25).

Improved accessibility to maternal services hasn't eradicated delayed initiation of ANC; 67.61% delay their first appointment (5). Active involvement of male partners during ANC enhances institutional deliveries, postnatal service utilization, and spousal communication, but societal norms and healthcare system challenges hinder this engagement (26). Sociocultural norms cause discomfort for men attending clinics with partners, contributing to delays in seeking healthcare (27). Male involvement significantly impacts when and where women seek services, affecting maternal morbidity and mortality (28, 29). Despite enhanced access, limited male engagement during ANC persists in Ethiopia, necessitating assessment and intervention in Hawassa City's public health facilities (32). This study could fill a gap in understanding factors influencing male involvement during ANC, offering valuable insights for stakeholders including healthcare providers, policymakers, and program planners

Methods and Materials

Study Area

The research was carried out in public health facilities within Hawassa City, situated in the Sidama region of Ethiopia. As the capital City of the Sidama National Regional State, Hawassa is located 274 km South of Addis Ababa, Ethiopia's Capital. The City comprises of 8 sub-cities and 32 kebele administrations. According Hawassa City Administration Health Department aimed to offer at least one ANC service to approximately 20,000 pregnant women since 2014. The City's health infrastructure, as per the health department report, includes 4 public hospitals, 5 health centers, and 9 health posts, all actively serving the community.

Study design

An institution based cross-sectional study was conducted in Hawassa City public health facilities from July 1- 30, 2022.

Population

Source population

All pregnant mothers attending ANC in public health facilities of Hawassa City Administration were source population.

Study population

All selected pregnant mothers visiting ANC in public health facilities of Hawassa City who fulfilled the inclusion criteria were study population.

Inclusion and exclusion criteria

Inclusion criteria

All pregnant mothers visiting public health facilities of Hawassa City for ANC services during study period were included in the study.

Exclusion criteria

Pregnant mothers who are seriously ill or not capable of being interviewed or who referred from other health facility for investigation were excluded from the study. Further, pregnant women whose widowed, divorced, pregnancy was without marriage and woman herself the head of household were excluded from the study.

Sample size & sampling procedure

The sample size was calculated using the single population proportion formula using Epi Info version 7 software considering the following assumptions: 20% proportion of Male partners involvement in maternal ANC visit: With the foregoing assumptions, the sample size was 384. After adding 10% for non-respondents, the final sample size was 422. Health centers (Alamura, Tilte and Ceffe), and Hospitals (Adare, Furra and Tula) were selected based on simple random sampling technic. The samples were proportionally allocated to each health center and hospitals based on their previous year ANC achievement. Finally, from each stratum, study participants were selected by

systematic random sampling technique: 180 from Health centers (Alamura, Tilte and Ceffe), 242 from Hospitals (Adare, Furra and Tula).

Study Variables

Dependent variable

- Male partner involvement during ANC visit

Independent variable

- Socio demographic factors (maternal age, marital status, maternal education, and Family size).
- Community level variables (Place of residence and distance from health facility).
- Pregnancy and maternal health related (Parity, terminated pregnancy and wanted last child).
- media exposure
- Presence of ambulance service
- Member of women health development army

Operational definition

Male partner involvement during ANC visits refers to the active participation and support of the male partner in the various aspects of ANC that a pregnant woman receives.

Ante natal care; is service given for pregnant mothers from conception to delivery of fetus (34).

Health workers cooperation refers to the collaborative effort of healthcare professionals to provide information and support to the male partners of pregnant women regarding their involvement in the antenatal care process.

Data collection tools & procedures

This research encompasses the organized gathering of data using standardized methods and tools to collect data using structured interviewer-administered questionnaires. The questionnaires were developed through a comprehensive review of relevant literature to ensure alignment with the study's objectives (Annex 1). Teams comprising of five BSc nurses and MSc Midwives were employed as data collectors and supervisors, respectively. These teams underwent a one-day training session covering research objectives, participant engagement, and data handling before commencing the data collection. The exit interview technique was utilized to obtain information from participants on socio-demographic characteristics, behavioral factors, community-level variables, and maternal/pregnancy-related history. To facilitate inclusivity, the questionnaire was initially crafted in English **(Annex II, Annex III),** translated into Amharic **(Annex IV)** and Sidamic (a local

language), and then back-translated into English to ensure consistency, with a verification conducted by a translator.

Data quality control

Before conducting the main study pre-test was carried out on 5 % of ANC seekers who were not included in the study. Based on the finding of pre-test, data collectors were reoriented and the questionnaire was modified as necessary. Strict supervision was made to ensure the overall quality of data collection. The collected data were also checked for completeness and consistency before processing and analyzing data.

Data processing and analysis

The data were entered in kobo toolbox server. After validated entry and documentation, the data were transferred to IBM SPSS 23 version for analysis. Both descriptive and inferential statistics were computed to summarize the data. Binary logistic regression analysis was done to assess candidate variable for multivariable binary regression. Multi-collinearity was assessed by using variance inflating factor and model fitness was tested by using Hosmer-Leme show goodness of fit test. Those variables which found to have p value < 0.25 in the binary logistic regression analyses were entered into the multivariable logistic regression model and statistical significance was declared at p value < 0.05. The strength of association was assessed by adjusted odds ratio (AOR) with 95% confidence interval. The results are presented in Tables, texts and Figures.

Results

Socio-demographic characterstics

In this study 406 respondents participated in the study giving response rate of 96%. Among those 404 (99.5%) reside in the urban kebeles. The mean age of participants was 24.35±4.5 years. From the total participants 392 (96.8%) were married. Of those 315(77.6%) and 66(16.3%) of participants were protestants and orthodox religious followers, respectively. About 229(56.4%) of respondents attended secondary school. Of totals, 222 (54.7%) participants married by traditional way of marriage. Among total respondents, 292 (71.9%) and 308(75.9%) had radio and television, respectively, in their household. Of totals 243(59.9%) participants were housewives, while 49 (12.1%) were government employers. Majority 288(71%) of husbands of the participant were educated secondary school and above (Table 1).

Table 1. Socio-demographic characteristics of respondents in Hawassa City public health facilities, Sidama Region, Ethiopia, 2022

Variable	Response	Frequency	Percentage
Residence	Urban	404	99.5
	Rural	2	.5
Educational status	No formal education	12	3.0
	Primary education	165	40.6
	Secondary school and above	229	56.4
Religions	Muslim	23	5.7
	Orthodox	66	16.3
	Protestant	315	77.6
	other	2	.4
Have you TV at household	No	98	24.1
	Yes	308	75.9
Have you Radio at household	Yes	292	71.9
	No	114	28.1
Types of marriage	Civil marriage	34	8.4
	Religious marriage	150	36.9
	Traditional marriage	222	54.7
Husband education	No formal education	8	2.0
	Primary school (1-8)	110	27.1
	Secondary school (9-12) & above	288	70.9
Occupation	Daily laborer	11	2.7
	Government worker	49	12.1
	Housewives	243	59.9
	Merchant	36	8.9
	Others	67	16.5
Husbands occupation	Daily laborer	63	15.5
	Government worker	125	30.8
	Merchant	70	17.2
	Others specify	148	36.5

Reproductive health characteristics of respondents

Out of the total respondents, above one-third 146(36%) of participants had four and above family size. From overall participants 188(46.3%) had Null Para. More than half, 218 (53.7%), of respondents had given births one or more. Of the total respondents, 215(53%) attended ANC for previous pregnancy and 22 (5.4%) had complication

during last pregnancy. From the total respondents, 16(3.9%) had history of still birth. About 217(53.4%) of respondents knew current pregnancy by missed period. Of the total respondents, 371(91.4%) of pregnancy was the planned one (Table 2).

Table 2. Reproductive characteristics of respondents in Hawassa City public health facilities, Sidama Region, Ethiopia, 2022

Variables	Responses	Frequency	Percentages
Means of current	Missing period	217	53.4
pregnancy recognition	Urine test	189	46.6
Pregnancy planned	No	35	8.6
	Yes	371	91.4
Had complication in a	No	384	94.6
previous pregnancy	Yes	22	5.4
Attended ANC for	No	191	47.0
past pregnancy	Yes	215	53.0
History of stillbirth	Yes	26	6.4
	No	380	93.6
Parity	Null	188	46.3
	1-2	185	45.6
	≥3	33	8.1

Health service utilization related characteristics of respondents

Of the total respondents, 318(78.3%) claimed that their partners heard about the existence of ANC services in health facility.

Of the totals, 286(70.4%) of respondents had known when to book the firs ANC service.

About 375(92.4%) respondent require less than one hour to reach health facility. About 304 (74.9%) respondent had access to ambulance services. About 20(5%) of respondents were members of women health development army. About 351(86.5%) of respondents perceiving that health workers were cooperative to involve male partner during ANC visit (Table 3).

Table 3. Health service access and utilization characteristics of respondents in Hawassa City public health facilities, Sidama Region, Ethiopia 2022.

Variables	Responses	Frequency	Percentages
A woman informed when to book to first ANC	No	120	29.6
	Yes	286	70.4
Heard existence of ANC	No	88	21.7
	Yes	318	78.3
Member of women health development army	No	386	95.1
	Yes	20	4.9
Presence of ambulance service	No	102	25.1
	Yes	304	74.9
Distance to a health facility	<1hour	375	92.4
	>1hour	31	7.6
Health workers cooperation on husband involvement	Cooperative	351	86.5
	Not cooperative	55	13.5

Prevalence of Male involvement

About 260(61.6%) of respondents' partners thought that pregnancy was the women's duty. Of total, 139(34.2%) respondents' partners believe that birth was natural phenomena. Overall prevalence of male partner involvement in ANC visit was 70.4% with 95 % confidence interval (65.99, 74.90) (Figure 1).

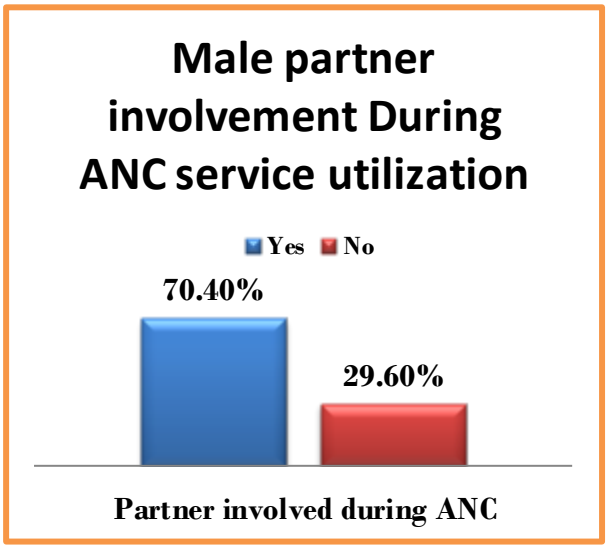

Figure 1: Male partner involvement during ANC service utilization in Hawassa City public health facilities, Sidama Region, Ethiopia 2022

Factor associated with male partner involvement

During bivariate analysis cooperation of health worker, previous history of ANC attendance, null parity and planed pregnancy were independent predictor of male

involvement during ANC service utilization. However, during multivariable analysis after adjusting for potential confounder, planed pregnancy AOR 2.9 [95% confidence interval (1.4, 6.1)] times and health worker cooperation AOR 3.4 [95% confidence interval (1.8,6.3)] times predict the involvement of male partner during ANC service utilization.

The odds of male involvement during ANC service were approximately three [AOR 2.9; 95% CI (1.4, 6.1) times higher among those who had planned pregnancy as compared to their counterpart. The likelihood of male accompaniments during ANC service were three [AOR 3.4, 95% Cl (1.8, 6.3)] times higher among those whose health worker were cooperative as compared to their counterpart ((Table 4).

Table 4. Factors associated with male partner involvement during ANC service utilization in Hawassa City public health facilities, Sidama Region, Ethiopia, 2022.

Variable	Response	Male partner involvement		COR with 95% CI	AOR with 95% CI
		Yes	No		
Pregnancy planned	Yes	270(94.4%)	101(84.2%)	3.2(1.6, 6.4)	2.9(1.4 6.1)**
	No	16(5.6%)	19(15.8%)	1	1
Informed when to book to	Yes	196(68.5%)	90(75.0%)	0.73(0.45, 1.20)	1.2(0.59, 2.5)
first ANC	No	90(31.5%)	30(25.0%)	1	1
Heard the existence of	Yes	217(75.9%)	69(24.1%)	1.7(.97, 2.96)	1.5(0.67, 3.4)
ANC	No	101(84.2%)	19(15.8%)	1	1
Health workers'	Cooperate	261(91.3%)	90(75.0%)	3.5(1.94, 6.23)	3.4(1.8, 6.3)**
cooperation on	Not				1
husband involvement	Cooperate	25(8.7%)	30(25.0%)	1	
	Null	146(51.0%)	42(35.0%)	1.9(1.25, 3.01)	1.0(0.38, 2.7)
Parity	>=1	140(49.0%)	78(65.0%)	1	1
Gravidity	Primi	128(44.8%)	34(28.3%)	2.05(1.29, 3.2)	1.6(0.63, 4.2)
	Multi	158(55.2%)	86(71.7%)	1	
Age	<25yrs	198(69.2%)	76(63.3%)	1.3(0.832, 2.04)	1.2(0.69, 1.9)
	≥25	88(30.8%)	44(36.7%)	1	1
Attended ANC for past	Yes	138(48.3%)	43(35.8%)	1.92(1.24,2.98)	1.3(0.55, 3.3)
pregnancy	No	148(51.7%)	77(64.2%)	1	1

Husband believe child	No	182(63.6%)	85(70.8%)	0.72(0.45, 1.14)	0.68(0.42, 1.1)
birth is natural phenomena	Yes	104(36.4%)	35(29.2%)	1	1

1 = reference category, *= significant at p- value of 0.05

Discussion

Male involvement at antenatal care visits is characterized by the willingness of male partners to recognize and actively engage in maternal health matters. The active participation of men in ANC is considered crucial for enhancing positive outcomes for both mothers and newborns (11). This research investigated the factors that impact male participation in the antenatal care of their partners. The study revealed a prevalence of 70.4% for men attending antenatal care visits with their partners. These results align with a similar study conducted in Nigeria, where a study in an urban region found that 73.3% of males were found to be involved in antenatal care service (35).

The observed prevalence in this study surpasses that reported in other investigations conducted in northwest Ethiopia, Harari public health institutions, eastern Ethiopia, and Central Tanzania. In a previous study, male involvement in ANC visits was found to be 40.5% among all participants in northwestern Ethiopia (36), 19.7% in Harar City (37), and 53.9% in Central Tanzania (38). This discrepancy may be attributed to notable improvements in national reproductive policies, infrastructures, and various modalities of reproductive health promotion. Additionally, our study was carried out in urban public health facilities, which offer enhanced accessibility, and a majority of participants and their husbands had educational backgrounds.

The research revealed a notable correlation between planned pregnancies and increased participation of male partners in ANC services. Individuals with planned pregnancies were found to be three times more likely to have their male partners involved in ANC, with [AOR; 2.9, 95%CI (1.4, 6.1)], compared to those who did not plan their pregnancies. This heightened involvement may be attributed to the fact that individuals who intentionally plan for pregnancy are more prepared to be engaged in monitoring the well-being of the pregnancy from its early stages. This observation stems from a cross-sectional study conducted in Kyela district, Mbeya, as indicated in the hospital-based research (39). This research revealed a substantial correlation between collaboration among health professionals and the involvement of

male partners ANC visit. The chances of male partner involvement were found to be three and a half times higher when health professionals cooperated to engage partners during visits, compared to those where such cooperation was lacking. This discovery aligns with similar findings in studies conducted in Nigeria and a case-control study in the Gedeo zone. The results underscored that a positive attitude from healthcare providers significantly increased the likelihood of male partner involvement (35). Nevertheless, the results are in contrast to those of a study carried out in Central Tanzania. That study revealed an inverse correlation between participants' perceptions of health care providers' attitudes towards men accompanying their partners to ANC and the extent of men's engagement in ANC. The findings indicate that participants who perceived a positive attitude among providers had lower odds of involvement compared to those who held a negative perception (38).

Limitation

The outcome variable and the factor variables were assessed simultaneously, that made establishing cause and effect relations impossible. In this study information about husband was obtained from the wife, this might lead to recall bias since wife could not know each and every thing about her husbands. The study did not include qualitative analysis of social, cultural and behavioral issues. Furthermore; this study was conducted in facility-based setup. So, it cannot show the magnitude of population level prevalence and the finding can't be concluded for the whole communities' of Hawassa City.

Conclusion

This study contributed valuable insights into the multifaceted determinants of male involvement in ANC, emphasizing the roles of planned pregnancy and health professional cooperation. The variations observed across geographic regions based on literatures highlight the need for context-specific interventions to enhance male participation in maternal health, ultimately contributing to improved outcomes for mothers and newborns

Acknowledgements

We would like to thank Pharma College, Postgraduate Program of Public Health. Our gratitude typically goes to the study participants and data collectors for their valuable time, commitment and their support in during the study. We want to express our appreciation for the Hawassa City Health

Bureau and Health Centers (Alamura, Tilte and Ceffe), and Hospitals (Adare, Furra and Tula) for their assistance during the conduct of the study.

Ethical considerations

Ethical clearance was obtained from the Pharma College Institutional Research Ethics and Review Committee (PC-IRERC), Hawassa campus. An official letter of cooperation was written from Hawassa City Health Department to Hawassa City Administration public health facility. Each study participant was adequately informed about the objective of the study and anticipated benefit and risk of the study by their data collectors. Verbal consent was obtained from study participants for protecting autonomy and ensuring confidentiality. Respondents also told the right not to respond to the questions if they don't want to respond or want to terminate the interview at any time.

Acronym and Abbreviation

ANC: Ante Natal Care

BF: Breast Feeding

EDHS: Ethiopia Demographic and Health Survey

FP: Family Planning

HE: Health Education

IRB: Institutional Review Board

PNC: Postnatal Care

PMTCT: Prevention of Mother to Child Transmissions

SSA: Sub-Saharan Africa

SBAS: Skilled Birth Attendants

SDG: Sustainable Development Goal

SPSS: Statistical Package for Social Science

TT: Tetanus Toxoid

WHO: World Health Organization

Data availability statement

The datasets analyzed during the current study are available upon reasonable request from the corresponding author.

Conflicts of Interest

The authors declared no conflicts of interest exist.

Funding statement

No funding was received for this research

Authors' contributions

KTB and SB participated in planning the study, writing proposal, monitoring data collection process and analyzing the data, writing the result and the manuscript. All authors agreed to be accountable for all aspects of the work. All authors read and approved the final manuscript.

Supplementary Materials:

The following supporting information can be downloaded. S1: Information Sheet. S2: Consent Form. S3. English version questionnaires for interview. S4: Amharic version Questionnaire

References

1. World Health Organization Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. 2015.
2. Hogan MC, Kyle JF, Mohsen N, Stephanie YA, Mengru W, Susanna MM, Alan DL, Rafael L, Christopher JL., Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5. The Lancet. 2010;375(9726):1609-23.
3. World Health Organization. WHO recommendations on health promotion interventions for maternal and newborn health, 2015.
4. Chattopadhyay A. Men in maternal care: evidence from India. J Biosocial Sci. 2012;44(2):129-153.
5. Belay DG, Fantu MA, Denekew TA, Yibeltal ST, Kassahun AG, Zemenu TT. Spatiotemporal distribution and determinants of delayed first antenatal care visit among reproductive age women in Ethiopia: a spatial and multilevel analysis. BMC Public Health. 2021;21(1):1570.
6. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. 2016.
7. Authority CS. Ethiopia demographic and health survey 2000. 2001.
8. World Health Organization. Sucess factors for women's and children's health: policy and programme highlights from 10 fast-track countries. 2014.
9. Green CP, Chohen SI, H. Belhadj-El G. Male involvement in reproductive health, including family planning and sexual health. 1995: United Nations Population Fund New York.
10. Myanmar W. Reproductive health stakeholder analysis in Myanmar 200*6*. 2007.
11. Yargawa J, Leonardi-Bee J. Male involvement and maternal health outcomes: systematic review and meta-analysis. J Epidemiol Comm Health. 2015;69(6): 604-12.
12. Gebresilassie B, Tilahun B, Weyzer T, Betell B, Senait G., Timing of first antenatal care attendance and associated factors among pregnant women in public

health institutions of Axum town, Tigray, Ethiopia, 2017: a mixed design study. BMC Pregnancy Childbirth. 2019; 19(1):1-11.

13. Yalew M, Bezawit A, Yitayish D, Bereket, Reta D, Kefale M, Mastewal A, Assefa A. Determinants of change in timely first antenatal booking among pregnant women in Ethiopia: A decomposition analysis. Plos One. 2021;16(6): e0251847.
14. Wai KM, Kyi MW, Akira S, Nwe NO, Toki JF, Yu MS, Masamine J. Are husbands involving in their spouses' utilization of maternal care services?: a cross-sectional study in Yangon, Myanmar. PloS One. 2015;10(12): e0144135.
15. Ditekemena J, Olivier K, Cyril E, Richard M, Antoinette T, Robert R, Robert C. Determinants of male involvement in maternal and child health services in sub-Saharan Africa: a review. Reproductive Health. 2012;9(1): 1-8.
16. Assembly G. United Nations: Transforming our world: The 2030 agenda for sustainable development. UN: New York, NY, USA, 2015.
17. Mamo ZB, Kebede S, Selamawit DA, Belay M., Determinants of male partner involvement during antenatal care among pregnant women in Gedeo Zone, South Ethiopia: A case-control study. Annals Global Health. 2021;87(1). DOI:10.5334/aogh.3003.
18. Jackson R, Fisaha HT, Hagos G, Tesfay GG. Health extension workers' and mothers' attitudes to maternal health service utilization and acceptance in Adwa Woreda, Tigray Region, Ethiopia. PLoS One. 2016;11(3): e0150747
18. Osamor PE, Grady C. Women's autonomy in health care decision-making in developing countries: a synthesis of the literature. Int J Women's Health. 2016; 8:191.
19. Forbes F, Karen W, Catherine W, Berihun M, Jane F. Male partner attendance at antenatal care and adherence to antenatal care guidelines: secondary analysis of 2011 Ethiopian demographic and health survey dat*a*. BMC Pregnancy Childbirth. 2018;18(1):1-11.
20. Odimegwu C, Alfred A, Tanwa O, Bisi A, Yinka A, Olu O, Femi E. Men's role in emergency obstetric care in Osun State of Nigeria. Afri J Reproductive Health, 2005;9(3):59-71.
21. Biratu BT, Lindstrom DP. The influence of husbands' approval on women's use of prenatal care: results from Yirgalem and

Jimma towns, South West Ethiopia. Ethiopian J Health Develop. 2006;20(2): 84-92.

22. Tweheyo, R., Joseph KL, Nazarius MT, Juliet NS. Male partner attendance of skilled antenatal care in peri-urban Gulu district, Northern Uganda. BMC Pregnancy Childbirth. 2010;10(1):1-9.
23. Gross, K., Sandra A, Tracy RG, Joanna AS, Brigit O. Timing of antenatal care for adolescent and adult pregnant women in South-Eastern Tanzania. BMC Pregnancy Childbirth. 2012;12(1): 1-12.
24. Csa I. Central Statistical Agency (CSA) of Ethiopia and ICF. Ethiopia Demographic and Health Survey, Addis Ababa, 2016.
25. Jennings L, Muzi N, Megan C, Michelle H, Britta M, Saifuddin A. Women's empowerment and male involvement in antenatal care: analyses of Demographic and Health Surveys (DHS) in selected African countries. BMC Pregnancy Childbirth. 2014; 14(1):1-11.
26. Davis J, Cathy V, Justine N, Lisa D, Hellen K, Eileen A, Liz C, Stanley L. Expectant fathers' participation in antenatal care services in Papua New Guinea: a qualitative inquiry. BMC Pregnancy Childbirth, 2018;18(1): 1-13.
27. Laddunuri MM. Maternal mortality in rural areas of Dodoma region, Tanzania: a qualitative study. Int J Caring Sci., 2013;6(2):236-242.
28. ICF Macro I. Tanzania demographic and health survey 2010. 2011.
29. Mullany BC, Becker S, Hindin M. The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: results from a randomized controlled trial. Health Edu Res. 2007;22(2):166-76.
30. Pulerwitz J, Annie M, Ravi V, Ellen W. Addressing gender dynamics and engaging men in HIV programs: lessons learned from Horizons research. Public Health Reports. 2010;125(2): 282-92.
31. Peneza AK, Maluka SO. 'Unless you come with your partner you will be sent back home': strategies used to promote male involvement in antenatal care in Southern Tanzania. Global Health Action. 2018;11(1):1449724.
32. Tesfaye G, Deborah L, Catherine C, Agumasie S, Roger S. Delayed initiation of antenatal care and associated factors in Ethiopia: a systematic review and meta-analysis. Reprod Health, 2017;14(1): 150.

33. World Health Organization. WHO Recommendations on antenatal care for a positive pregnancy experience, 2016.
34. Ibrahim S, Muhammad BA, Hadiza U, Umaru UD. Factors influencing husbands' involvement in antenatal care services in a Nigerian Urban Region. J BioMed Res Clinical Practice. 2019;2(1):32-9.
35. Mersha AG. Male involvement in the maternal health care system: implication towards decreasing the high burden of maternal mortality. BMC Pregnancy Childbirth. 2018;18(1): 1-8.
36. Asefa F, Geleto A, Dessie Y. *M*ale partners involvement in maternal ANC care: the view of women attending ANC in Hararipublic health institutions, eastern Ethiopia. Sci J Public Health. 2014;2(3): 182-8.
37. Gibore NS, Bali TA, Kibusi SM. Factors influencing men's involvement in antenatal care services: a cross-sectional study in a low resource setting, Central Tanzania. Reproductive Health. 2019; 16(1): 1-10.
38. Kabanga E, Alferd C, Namanya B, Domenica M. Prevalence of male partners involvement in antenatal care visits-in Kyela district, Mbeya. BMC Pregnancy Childbirth, 2019;19(1):1-6.