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Research Article

The Prevalence and Determinants of Male Involvement in Antenatal Care: A Cross-Sectional Study in Primary Health Care Facilities in Dar es Salaam, Tanzania

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Abstract

Background: Male participation in Antenatal Care Services (ANC) is critical to improving mother and child health outcomes since it promotes early access to the formal health system, encourages competent delivery attendance, and supports baby and family well-being. Despite its significance, male participation in ANC is still a challenge in Africa and Tanzania. We aimed to determine the prevalence and determinants of male ANC participation at facilities in the Ubungo Municipal Council.

Methodology: The cross-sectional study used a simple random sampling strategy to obtain 126 men using a Kobo questionnaire. Descriptive statistics and modified Poisson regression assessed determinants of male involvement, whereas variables with *p*-values < 0.2 in the multivariable model and statistical significance were determined at $p < 0.05$.

Results: The 126 men (18 to 56 years, mean age = 34.5, SD = 6.2), Participants (62.0%) from Sinza District Hospital, had primary education (61.1%). The prevalence was 84.9% (95% CI: 78.2% - 90.3%). Determinants were (APR = 2.18; 95% CI: 1.17 - 4.06), education (APR = 1.88; 95% CI: 1.31 - 2.71), married (APR = 1.72; 95% CI: 1.11 - 2.26), income (APR = 1.51; 95% CI: 1.12 - 2.03 and know ANC (APR = 4.92; 95% CI: 2.71 - 8.94). Dispensary (APR = 1.98; 95% CI: 1.05 - 3.39), neutral/welcoming (APR = 2.12; 95% CI: 1.15 - 3.91), waiting time (APR = 0.61; 95% CI: 0.39 - 0.95), friendly ANC (APR = 0.61; 95% CI: 0.39 - 0.94), norms (APR = 0.59; 95% CI: 0.38 - 0.91), past ANC (APR = 1.67; 95% CI: 1.09 - 2.56), no fear HIV testing (APR = 1.52; 95% CI: 1.08 - 2.14).

Conclusion: Highest prevalence of men's involvement, and the factors associated with men's involvement were men's individual social demographic factors, health facilities factors, and culturally related factors.

Background

Antenatal Care Services (ANC) is the important part in maternal and child health, as it offers an opportunity to promote helpful health changes and early detection of pregnant women's complications while connecting them with their family to health facilities [1]. Worldwide and in Tanzanian contexts, the ANC has become the strategic entry point for involving men in reproductive health services; this has improved maternal and child health in families [1]. The International Conference on Population and Development (ICPD) held in Cairo in 1994 and the Fourth World Conference on Women in Beijing held in 1995 both underscore the shared responsibilities of men in reproductive health [2]. Despite the global advocacy of male involvement in ANC, in many developing nations, including Tanzania, it is still very low [2]. Several factors, like gender-based violence, social stigma, and health care facilities, continue to exclude men from ANC services [2].

Male involvement in advanced ANC care services enhances

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maternal and neonatal outcomes and increases the likelihood of good maternal and newborn health [3]. Men's involvement gives men opportunities to support their spouses, encouraging birth preparedness and contributing to timely health-seeking behavior during and after deliveries [3].

The current study in Tanzania shows the variability in male involvement across the region; as an example, in the Mbeya region, male involvement is 21.7% in rural and 58% in urban areas, and the factors resulting in low male involvement are health care workers attitudes and long waiting times at ANC [4,5]. Another study done in Nyamagana District Council, Mwanza region, Kilimanjaro region, and Dodoma in 2022 showed a higher percentage of male involvement, about 76.3%; this is attributed to men fearing HIV testing, facing stigma, religion, residences, lack of time due to work commitment, lack of a strictly legal policy that requires men's presence at ANC, and lack of a men's fast-tracking policy at health facilities [5,6].

Despite these findings 'from other regions in Tanzania, male involvement in primary health facilities in urban districts like Ubungo Municipal Council in Dar es Salaam Capital City is not as well-known and well-studied as in the urban center, as urban districts like Ubungo Municipal Council represent unique dynamics like facility congestion, diverse cultural backgrounds, and competing economic pressures [7]. Therefore, understanding male involvement in this municipality area is essential for developing the local and relevant strategies to promote and support male engagement in maternal and child health in general [8]. Therefore, our study seeks to assess the prevalence and determinants of male involvement in primary health facilities in Ubungo Municipal Council in Dar es Salaam, Tanzania, in order to provide evidence to inform targeted intervention and policy in Tanzania.

What is known

- The male involvement in ANC is widely recognized as a key strategy for improving maternal and child health outcomes across the globe.
- In Tanzania and other similar settings, the overall prevalence of male involvement in ANC remains less than 67%, which is low despite the policy recommendation of above 95%. However, previous studies underscored education, income, and occupation as the main determinants of male involvement in ANC services.

What this study adds

- This study provides a region-specific, recent prevalence of male involvement within the primary health care facilities at Ubungo Municipality, Dar es Salaam, which is the big urban center in Tanzania, since more than 75% of pregnant women attend their ANC services in the primary health care facilities.
- The study goes beyond the individual factors to also include the health system-level determinants like distances to ANC clinics and quality of ANC services. However, the findings of this study provide evidence-based solutions to increase male involvement in other similar urban settings like Ubungo Municipality.

Methodology

Study design

The study was hospital-based and analytical and cross-sectional to assess the prevalence and determinants of male involvement in antenatal care services at primary health care facilities in Ubungo Municipal Council, Dar es Salaam, Tanzania, from January to June 2023.

Sample size calculation

The sample size to be used in this study was calculated by using a single standard proportion formula.

$N = Z^2 P (100-p)$

E2

Where N = sample size.

Z = Standard normal deviation of 1.96, corresponding to 95% confidence

interval

P = the proportion of males participating in ANCs is 5.1%. This is from one of the

study done in Tanzania [9].

E = the marginal error, which is 5%

$N = (1.96)^2 \times 5 (100-5) = 114.547$ (approximate) = 115

42

To add 10% of this value to take care of possible non-respondents, 115 + 115 X 10% = 126

Therefore, the sample size was 126 men whose women/partners are pregnant and attending ANC at Primary Health facilities at Ubungo Municipal Council.

Study area

The study was conducted at the Ubungo Municipal of Dar es Salaam city in Tanzania. The municipality is bordered by the Kibaha District to the north, the Kinondoni District to the southeast, and the Kisarawe District to the west. The municipality has a total area of 269.40 square kilometers. According to the 2022 population census, the municipality had a population of 1,086,912 with a growth rate of 5.0% per annum and a population density of 4,911 people per square kilometer. The municipality is estimated to have more than 357,837 households with an average of 6 persons per household. It is reported to be one of the districts with the largest number of women of reproductive age in Tanzania (Tanzania National Census, 2022, and Ubungo Municipality Profile Report, 2020).

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The municipality currently has a total of 263 health facilities. 152 dispensaries, 5 health centers, and 6 hospitals, which are government-owned and owned by private organizations. The municipality has more than 183,492 women attending ANC in 2022, as per the Tanzania District Health Information System 2. The study was conducted at three health facilities, which were Sinza District Hospital, Kimara Health Centre, and Manzese Dispensary. These facilities were selected since they have the highest number of ANC women they attend annually compared to other health facilities.

Sampling procedure

Three health facilities, Sinza District Hospital, Kimara Health Centre, and Manzese Dispensary, were purposefully chosen to symbolize different levels of primary health care in the Ubungo City Council. In these institutions, a simple random sample procedure was used to recruit male volunteers whose spouses were pregnant and receiving antenatal care (ANC). The number of men sampled from each institution was proportionally determined based on the ANC attendance data at each location. Men who accompanied their partners on ANC visits were approached and interviewed at the facility. Those who did not come with their partners were contacted by phone and invited to engage in interviews aimed at assessing barriers to their participation in ANC programs. All participants were chosen using basic random sampling using a random number generator in the Epi Info 7 software. Sampling proceeded until the target sample size of 126 men was met.

Inclusion criteria and exclusion criteria

The study included men who were mentally and/or physically capable, whose women or partners attended ANCs clinics at three selected health facilities, who were aged 18 years or above, and who consented to participate in this study. However, we excluded the men who were sick and unable to respond to the interview at the planned time.

Study variables

The outcome variable in this study was male participation in ANC, which was a binary outcome (yes or no) and assessed using a composite index that included five key indicators: accompanying a partner to ANC visits, participating in discussions with health providers, providing financial or emotional support, being aware of ANC visit schedules, and participating in joint decision-making about maternal health. For men's responses, male involvement was classified into three levels: High (4-5 activities), Moderate (2 to 3 activities), and Low (1 or no activity), with overall men's involvement ranging from 2 to 5 activities. The independent variables were classified into five categories: economic variables, societal factors, health-care factors, knowledge and awareness, and individual men's factors. Economic factors included the man's employment status (formal, informal, or unemployed), monthly household income, direct financial costs associated with attending ANC (such as transportation and service fees), and the opportunity cost of time spent away from work or income-generating activities. Cultural factors regarding male responsibilities in reproductive health, peer influence, cultural expectations, and religious beliefs all played a role in determining whether or not men participated. Furthermore, perceived societal stigma against men seeking ANC services was investigated as a potential obstacle. Health system factors took into account the structural and service delivery elements that could influence male engagement. These included health care providers' attitudes toward male partners, wait times at health facilities, the availability of male-friendly clinic infrastructure, and the extent to which ANC services included male-focused health education or couple-oriented services like joint HIV testing and counseling. Knowledge and awareness-related factors included the respondent's knowledge of the importance and timing of ANC, awareness of pregnancy-related health risks, comprehension of supportive male roles during pregnancy, and exposure to health information via community health workers, radio, posters, or other communication channels. Lastly, individual men's factors of male respondents were assessed, such as age, education level, marital status, number of children, previous experience with ANC, and the level of communication between partners concerning pregnancy and maternal health.

Data collection and management

Data were collected by three skilled and experienced nurse-midwives (one from each health facility). The study collected data using the Kobo Collector toolkit and closed-ended questions. The ANC card number 4 was evaluated to acquire vital obstetric information for both couples. In terms of data administration, the lead investigator ran daily checks on the data to confirm its accuracy before uploading it to the final Excel sheet. Any variables with missing or erroneous information were found and repaired by recalling the data collectors and examining the ANC registries to ensure data integrity throughout the collecting process. After data collection was complete, the final dataset was downloaded from Kobo Toolbox via the data extraction dropdown option. The final dataset was cleaned up using the sort and filter tools. Nurse-midwives' officers (research assistants) were hired to help in data collection. They received two days of training prior to data collection. They received training on the study's aims, ethical considerations, sampling technique, and data collection tool.

Data analysis

Prior to analysis, the dataset was cleaned using Microsoft Excel version 12 to verify data consistency and minimize entry errors. The dataset was identified and logically organized using sorting and filtering procedures, which allowed for the detection of outliers as well as missing or erroneous elements. Outliers were discovered and corrected by cross-referencing participant information from the ANC registry with unique identifiers. Missing data were addressed by obtaining the original information from delivery records, if accessible; items with unresolved missing values were excluded from the analysis on an individual level. Descriptive statistics were obtained using Stata version 15. Continuous variables were summarized using means and standard deviations, while categorical variables were presented as frequencies and proportions in

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tables and graphs. We employed a liberal inclusion criterion of $p < 0.2$ in the bivariable analysis to identify possible variables for the multivariable model, assessing the factors influencing male involvement in ANC. The final multivariable model revealed statistically significant variables connected to male involvement in ANC (p-value < 0.05). To calculate the adjusted prevalence ratios, we used a generalized linear model (GLM) with a Poisson distribution, log link function, and robust error variances. Furthermore, to account for the complex sample design and clustering introduced by the three-stage cluster sampling technique, the model's clustering was adjusted with cluster-robust standard errors.

Ethical consideration

Compliance with guidelines and regulations: All procedures used in this study followed and adhered to rules and regulations, such as the Declaration of Helsinki, World Health Regulation and rules, and Tanzania Ministry of Health Regulations Guidelines.

Ethical approval: The study was approved by the Muhimbili University of Health and Allied Sciences (MUHAS) Institutional Review Board (IRB), with reference number Ref. 2022-01-03/AEC/Vol.XII/223.

Permission to undertake the study: The President's Office of Regional Administration and Local Government (PORALG) granted us permission to collect data through the Regional Medical Officer (RMO) Office in the Dar es Salaam area and the Ubungo Municipal Council, using the reference number UBMC/MED/TRA/13. Furthermore, the in-charges of the health facilities gave explicit approval for this study to be conducted.

Informed consent: All subjects gave informed consent before being enrolled in the study, which was confirmed by signed consent forms. This strategy ensured that participants were fully informed about the study's objectives, methods, potential dangers, and rewards. Notably, no children participated in this study (including tissue sample donors), and no photos that may be used to identify anyone were used.

Participants' confidentiality: Participants' confidentiality was maintained by using unique codes rather than names, encrypting data with passwords, and limiting access to the research team. All personal identifiers were removed before analysis and publication.

Results

In terms of the social demographic characteristics of study participants, our study involved 126 men aged from 18 to 56 years old (the mean age was 34.5 years old, and SD = 6.2), who attended ANC at three selected health facilities at Ubungo Municipal Council from January to June 2024. 78 (62.0%) of the men were from Sinza District Hospital, 31 (24.6%) of the men were from Kimara Health Centre, and 17 (13.5%) of the men were from Manzese Dispensary. The majority of men have primary education (77, 61.1%); 72 (57.1%) had formal employment; 55 (43.7%) of men had incomes ranging from 50 to 100 USD per month; 98 (77.8%) of men have 2-4 children; and 98 (77.8%) of men were married. The social demographic characteristics of study participants are summarized in Table 1.

The prevalence of men's involvement in ANC services. Our study finds that the overall level of male involvement in ANC services in three selected health facilities at Ubungo Municipal Council was 84.9% (CI: 78.2% - 90.3%). However, a majority of men, 62 (49.2%) (CI: 40.8% - 57.7%), showed moderate involvement in ANC services, as summarized in Table 2 below. Regarding the determinants of male involvement in antenatal care services at primary health care facilities in Ubungo Municipal Council, Dar es Salaam, Tanzania, our study finds the following factors were associated with men's involvement in ANC services.

Table 1: Social demographic characteristics of study participants $N = 126$.

Variables	Frequency	Percentage	Mean (SD)
Age in years			
18-30	52	41.3	
31-45	68	54.0	34.5(6.2)
≥46	6	4.7	
Marital status			
Married	98	77.8	
Cohabiting	10	7.9	
Single	12	9.5	
Education level			
Primary	77	61.1	
Secondary	31	24.6	
College/diploma	12	9.5	
Higher education (Degree+)	6	4.8	
Employment status			
Formal employed	34	27.0	
Informal employed	72	57.1	
Unemployed	20	15.9	
Income per month in USD			
≤50	48	38.1	
51-100	55	43.7	
≥101	23	18.2	
Number of Children			
1	42	33.3	
2-4	71	56.3	2.1(1.3)
≥5	13	10.4	
Health facilities and their levels			
Sinza District Hospital	78	62.0	
Kimara Health Centre	31	24.6	
Manzese Dispensary	17	13.5%	
Total	126	100	

Table 2: Prevalence of male involvement in ANC services at three selected health facilities in Ubungo Municipal Council from January to June 2022 ($N = 126$).

S/N	Prevalence of men involvement	Definition of activities	Frequency	Percentage	95% CI
1.	High involvement	4-5	45	33.7	27.8%-44.4%
2.	Moderate involvement	2-3	62	49.2	40.8%-57.7%
3.	Low involvement	1	15	11.9	7.4%-18.6%
4.	No involvement	0	4	3.2	1.2%-8.0%
5.	Total	5	126	100%	NA
6.	Overall prevalence of men's involvement (1+2)	2-5	107	84.9%	78.2%-90.3%

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Individual factors

Men who were aged 31-45 years old were 2.18 times more likely to be involved in ANC compared to those who were more than 46 years old, with APR = 2.18 CI: 1.17 - 4.0; p = 0.015. However, young men aged 18-30 years old have a 1.82 increased likelihood of involvement, although this association was not significant (APR = 1.82; 95% CI: 0.96 - 3.45; p = 0.006). Men's education level was associated with ANC involvement, as men with primary, college, and higher education were more likely to be involved in ANC services with their partners; however, there was more significance among men with higher education compared to primary education, as secondary (APR = 1.43; 95% CI: 1.08 – 1.89; p = 0.013), diploma/college (APR = 1.65; 95% CI: 1.20 – 2.27; p = 0.002), and higher education (APR = 1.88; 95% CI: 1.31 – 2.71; p = 0.001).

Marital status showed a significant association with men's involvement: married and cohabiting men were 1.72 times more likely to engage their partners compared to single men (APR = 1.72; 95% CI: 1.11 – 2.26; p = 0.002) and (APR = 1.65; 95% CI: 1.06 – 2.58; p = 0.028), respectively. In terms of employment status, men with formal employment were 1.42 times more likely to be involved in ANC compared to non-employed men (APR = 1.42; 95% CI: 0.96 – 2.10), (p = 0.079); however, it was not significant.

Men's incomes played a key role in men's involvement, as our study showed that men with incomes more than or equal to 101 USD per month were 1.51 times more likely to be involved in ANC with their partners compared to those with incomes less than or equal to 50 USD per month (APR = 1.51; 95% CI: 1.12 – 2.03; p = 0.005), and men who reported understanding the importance of involving their partners in ANC for their health and their newborns health were 4.92 times more likely to be involved in ANC compared with those with no understanding (APR = 4.92; 95% CI: 2.71 – 8.94; p < 0.001).

Facility-Related Factors: Attending ANC services at the dispensary level was 1.98 times more likely to promote men's ANC involvement compared to hospital (APR = 1.98; 95% CI: 1.05 – 3.39; p = 0.034). Health providers with positive attitudes toward men who are involved in ANC services with their partners were 2.12 times more likely to associate with men's involvement compared with providers with negative attitudes (APR = 2.12; 95% CI: 1.15 – 3.91; p = 0.001). Shorter waiting times during ANC services of less than or equal to 1 hour were protective to male involvement with their partner compared to longer waiting times of more than or equal to two hours (APR = 0.61; 95% CI: 0.39 – 0.95; p = 0.029). Male-friendly environments at ANC clinics, including provider language and infrastructures, were protective of male involvement compared with non-friendly environments (APR = 0.61; 95% CI: 0.39 – 0.94; p = 0.001).

Cultural-Related Norms: Men whose communities support men's involvement in ANC had higher involvement compared with men with less community support (APR = 0.59; 95% CI: 0.38 – 0.91; p = 0.018). Men with prior experience accompanying a partner to ANC also increased the likelihood of current involvement (APR = 1.67; 95% CI: 1.09 – 2.56; p = 0.001) compared to those with no previous involvement experiences. Men who were not afraid of HIV testing were 1.52 times more likely to be involved in ANC services with their partner compared to men who feared HIV testing (APR = 1.52; 95% CI: 1.08 – 2.14; p = 0.001). The findings on the determinants of male involvement in antenatal care services at primary health care facilities in Ubungo Municipal Council, Dar es Salaam, Tanzania, are summarized in Table 3.

Discussion

Our study highlighted the highest prevalence of men's involvement, and the factors associated with men's involvement were men's individual social demographic factors, health facilities factors, and culturally related factors. The prevalence of men's involvement in ANC services shown in our study was higher, which exceeds the figure reported in tertiary hospitals done in Dar es Salaam in 2022 and the Mwanza region of Tanzania, with 76% and 78%, and is slightly similar to the study done in primary health care facilities in sub-Saharan countries, which is 60% - 70% [9-11]. The differences in men's involvement between the studies may be attributed to the fact that most of the primary health care facilities where our study was done have a higher number of clients and are easily accessible to men compared to tertiary health facilities, and the tertiary health facilities are few and mostly in bigger cities with the highest ANC service fees.

Our study highlighted the factors that were associated with men's involvement: men's individual social demographic factors, health facilities factors, and culturally related factors as discussed below; Men's individual social demographic factors: This study showed that men's age, education level, and marital status; men's income level per month; and awareness of the importance of ANC involvement to their women's and newborn health were more significantly associated with men's involvement. Similar findings were reported by the study done in Kenya and Rwanda; the similarities might be due to the fact that men in these countries share common individual social demographic factors [11,12]. Education level showed a substantial positive relationship with ANC participation. Men with secondary, college, and higher education were far more likely to join their partners. This is congruent with research conducted in Nigeria and Ethiopia, which revealed that higher educational attainment improves health literacy, resulting in increased ANC participation [5,11]. Education enables men to appreciate the significance of maternal health services and mitigates the impact of conventional gender stereotypes that consider ANC as a female obligation.

Marital status had a significant impact on male participation, with married and cohabiting men more engaged than single men. This finding is similar to previous research in Tanzania and Uganda, which revealed that commitment to a stable union promotes shared decision-making during pregnancy and childbirth [5,13]. While formal work was not statistically significant, income was a crucial factor. Men earning ≥101 USD per month were more likely to participate than those with lower salaries. This could be attributed to greater financial resources

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Table 3: Bivariable and Multivariable analysis of the determinants of male involvement in Antenatal Care Services at primary health care facilities in Ubungo Municipal Council, Dar es Salaam, Tanzania(*N* = 126).

Variable	Frequency	Percentages	cPR(95%CI)	APR (95% CI)	*p* - value
1. INDIVIDUAL FACTORS					
Age in years					
18-30	52	41.3	1.72(0.89.33)	1.82(0.96-3.45)	0.006
31-45	68	54.0	2.15(1.13-4.10)	2.18(1.17-4.06)	0.015
≥46	6	4.7	Ref	Ref	
Education level					
Primary	77	61.1	Ref	Ref	
Secondary	31	24.6	1.47(1.02-2.12)	1.43(1.08-1.89)	0.013
College/diploma	12	9.5	1.82(1.19-2.78)	1.65(1.20-2.27)	0.002
Higher education (Degree+)	6	4.8	2.15(1.31-3.53)	1.88(1.31-2.71)	0.001
Marital status					
Married	98	77.8	1.59(1.12-2.46)	1.72(1.11-2.26)	0.002
Cohabiting	10	7.9	1.42(0.82-2.46)	1.65(1.06-2.58)	0.028
Single	12	9.5	Ref	Ref	
Employment status					
Unemployed	20	15.9	Ref	Ref	
Formal employed	34	27.0	1.67(1.13-2.47)	1.42(0.96-2.10)	0.079
Informal employed	72	57.1	1.38(0.95-2.00)	1.25(0.86-1.82)0.241	
Income per month in USD					
≤50	48	38.1	Ref	Ref	
51-100	55	43.7	1.31(0.93-1.85)	1.24(0.95-1.62)	0.116
≥101	23	18.2	1.71(1.18-2.48)	1.51(1.12-2.03)	0.005
Number of Children					
≥5	13	10.4	Ref	Ref	
1	42	33.3	1.12(0.64-1.98)	1.22(0.70-2.13)	0.467
2-4	71	56.3	1.26(0.64-1.98)	1.32(0.78-2.23)	0.302
Understudying the importance of ANC Involvement with their partners					
No	19	15.1	Ref	Ref	
Yes	107	84.9	5.63(3.12-10.15)	4.92(2.71-8.94)	0.001
2. FACILITIES RELATED FACTORS					
Health facilities and their levels					
Hospital	78	62.0	Ref	Ref	
HealThe Centre	31	24.6	1.22(0.76-1.96)	1.18(0.71-1.97)	0.514
Dispensary	17	13.5%	2.01(1.18-3.42)	1.98(1.05-3.39)	0.034
Provider altitude					
Hostile	34	27.0	Ref	Ref	
Neutral	49	38.9	1.85(1.02-3.35)	2.12(1.15-3.91)	0.001
Welcoming	43	43.1	1.41(0.73-2.72)	1.13(0.55-2.32)	0.071
Waiting time (Hours)					
Long ≥ 2 hours	61	48.4	Ref	Ref	
Short≤1hour	66	51.6	0.57(0.37-0.89)	0.61(0.39-095	0.029
Men friendly environment and provider languages					
Not Friendly	72	57.1	Ref	Ref	
Friendly	54	42.9	0.65(1.09-0.98)	0.61(0.39-0.94)	0.001
3. CULTURAL RELATED NORMS/FACTORS					
Communities' norms on ANC involvement					
Non supportive	50	41.6	Ref	Ref	
Supportive	76	58.4	0.61(0.39-0.94)	0.59(0.38-0.91)	0.018
Pear men norms on your involvement					
Negative	69	54.7			
Positive	57	41.6	1.30(0.79-2.14)	1.22(0.74-2.01)	0.436
Previous experiences with ANC					
No	60	47.6	Ref	Ref	
Yes	66	52.4	1.59(1.12-2.26)	1.67(1.09-2.56)	0.001
Fear of HIV testing					
Yes	38	30.2	Ref	Ref	
No	88	69.8	1.48(1.09-2.01)	1.52(1.08-2.14)	0.001

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to support ANC visits or flexible work schedules that allow for clinic attendance. Economic stability is also important for male involvement, according to studies in Malawi and Zambia [5]. Importantly, men who recognized the importance of ANC for mother and newborn health were approximately five times more likely to participate. This emphasizes the necessity for community health education programs aimed at men. Awareness initiatives have been demonstrated to effectively increase male engagement in Sub-Saharan Africa.

Facility-related factors

Male involvement was connected with the level of the health facility, with clinics having a higher level of involvement than hospitals; this could be due to less congestion, shorter wait times, and improved provider-patient rapport at lower-level facilities [7]. Research in Ghana found similar results, with men preferring smaller facilities for privacy, provider availability, and perceived friendliness.

Male involvement was greatly influenced by provider attitudes. Neutral or welcoming provider attitudes were linked to increased male engagement, supporting data from Uganda and Tanzania, where negative staff behavior hindered male attendance at ANC clinics [14,15]. This conclusion emphasizes the need for health professionals' training in gender-sensitive care.

Shorter wait times and male-friendly surroundings were both positively associated with participation. Men frequently identify long wait times and hostile environments as impediments to participation [15]. As a result, boosting male engagement requires continued focus on health system responsiveness.

Cultural and normative influences

Cultural norms appeared as a key predictor of male participation. Men living in communities that encourage male ANC membership were substantially more likely to accompany their partners. Community-level endorsement has been shown to be an effective enabler in a variety of African situations [16,17]. This implies that efforts aimed at changing community conceptions of masculinity and caregiving are cultural and normative factors.

Cultural norms emerged as a strong predictor of male involvement. Men who lived in communities that promoted male ANC membership were significantly more likely to accompany their partners. Community-level endorsement has proven to be a successful enabler in a variety of African circumstances [16,17]. This demonstrates that interventions targeted at improving community perceptions of masculinity and caregiver roles can have a considerable public health impact.

Prior experience with ANC was also associated with current involvement, showing that familiarity promotes comfort and long-term commitment. Furthermore, fear of HIV testing remained a substantial barrier, consistent with prior studies showing that stigma and fear of undesired diagnosis deter males from accessing reproductive health care [12,16]. Addressing this issue through confidential counseling and male-specific HIV services may increase ANC participation.

Generally, this study showed the highest prevalence of men's involvement, and the factors associated with men's involvement were men's individual social demographic factors, health facilities factors, and culturally related factors.

Study limitation

This study focuses on the individual, facility-related, and cultural factors that influence male involvement in ANC in an urban Tanzanian area. However, its drawbacks include being based on self-reported data, which is susceptible to social desirability bias. Furthermore, the study's cross-sectional methodology limits its ability to reach causal conclusions.

Conclusion

This study highlighted the highest prevalence of men's involvement, and the factors associated with men's involvement were men's individual social demographic factors, health facilities factors, and culturally related factors.

Recommendations

Based on the study's findings, we recommend the following to the Ubungo Municipal Health Management Team, health care providers, the Ministry of Health, and reproductive and child health stakeholders.

1. To improve health education for men on the necessity of men's involvement with their partners for the health of their wives and babies.
2. To build men-friendly environments at ANC clinics, health care practitioners must use good customer service language and implement men-friendly ANC infrastructures.
3. To train ANC health care personnel to increase men's participation in ANC services at health facilities.
4. To enhance ANC, dispensaries are generally more accessible and provide less crowded, more personalized care, which men like.
5. Reduce the wait time for ANC services at all primary health care clinics by scheduling appointments.
6. To educate and counsel males about the need not to fear HIV testing during ANC appointments.

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Author's contribution

Conceptualization: J.M. &M. A; Data curation: J.M. & M.A; Formal analysis: J.M& M.A.; Methodology: J.M.; Software: J.M; Supervision: M.A; Writing original draft: J.M.& M.A; Writing review: M.A.; Corresponding author: J.M.

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