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Trends and correlates of male participation in maternal healthcare in a rural district in Ghana

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ABSTRACT

Male participation in maternal healthcare is important for better-quality maternal health outcomes. This study assessed the trends and correlates of male participation in antenatal care (ANC), delivery and postnatal care (PNC) in the Jaman North District of Ghana. Longitudinal data from 2012 to 2019 on male involvement in maternal healthcare were extracted from health records. A cross-sectional survey was administered to a stratified random sample of 318 mothers, who registered for PNC in 2020. Line graphs were used to illustrate the trends of male participation, and binary logistic regression analysis used to identify the correlates of male participation. The results show consistently low rates of male participation in maternal healthcare, with relatively higher participation rates for delivery compared to ANC and PNC within 2012–2019. The prevalence of male participation in the survey was 52.52% for delivery, 31.76% for PNC and 23.58% for ANC. Male participation in ANC was associated with a higher likelihood ($p < 0.05$) for women aged ≤ 31 years, married, educated, employed or had pregnancy-related complications, and a lower likelihood for those who stayed ≤ 3 years with their partners (AOR= 0.171; 95%CI 0.059–0.490) or had ≤ 2 children (AOR= 0.108; 95%CI: 0.019–0.608). Christianity (AOR=2.708; 95% CI of 1.296–5.660), motorcycle transport (AOR=4.340; 95%CI: 2.386–7.898) and pregnancy-related complications (AOR=1.823; 95% CI: 1.002–3.315) were associated with a high likelihood of male participation in delivery. Polygyny (AOR=0.343; 95%CI: 0.139–0.848), ≤ 2 children (AOR=0.240; 95%CI 0.081–0.715); and higher income (AOR=2.114; 95%CI: 1.202–3.718), were associated with low and high likelihoods of male participation in PNC, respectively. Given the low rates of male participation in maternal healthcare, community-level interventions such as drama and durbars on the importance

Abbreviations: ANC, antenatal care; AOR, adjusted odds ratio; CHPS, community-based health planning and services; CI, confidence interval; DHIMS, district health information management system; GHC, Ghana cedi; LMIC, low-and middle-income countries; PNC, postnatal care; SDGs, sustainable development goals; SSA, sub-Saharan Africa.

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of male participation should be targeted at the less educated, Muslims, newly married, low income and polygynous homes.

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Introduction

Globally, access to maternal healthcare is very essential in reducing the risk of pregnancy-related complications and maternal mortality [1,2]. Reducing maternal mortality during pregnancy, delivery, and within 42 days after delivery, is the first target of the Sustainable Development Goal (SDG) three [3]. As a result, enabling access to maternal healthcare has gained significant priority in recent global and national health policy reforms [4].

Culturally, patriarchy especially in low- and middle-income countries (LMICs) dictates male dominating decision-making over maternal care-seeking but considerably poor male involvement in maternal care sessions [5–7]. Male participation is the active involvement of men in their female partners' maternal healthcare seeking by accompanying them to the healthcare facility for antenatal care (ANC), delivery and postnatal care (PNC) as well as providing them with emotional, physical and financial support [8]. The participation of male partners in maternal healthcare enables male engagement with healthcare providers, which presents an opportunity for men to receive education on their partner's health and pregnancy-related health issues [9]. The health education that male partners receive by accompanying their female partners for maternal care enhances their knowledge to make effective decisions concerning the health of their female partners [10]. Such decisions could prevent delays in seeking ANC, promote skilled birth attendance, and increase the uptake of PNC interventions [9–12]. This value of male participation in maternal healthcare was recognised at important global fora including the International Conference on Population and Development, the 1995 United Nations Fourth World Conference for women, and the 48th United Nations Commission on the status of women [13].

Despite the known value of male participation in maternal health care, it is rare to find a male partner in maternal healthcare sessions in LMICs especially in sub-Saharan African (SSA) communities [11,13,14]. A prevalence of 66.2% of male participation was reported in the Bharatpur Metropolitan area in Nepal for PNC [15]. In SSA, the prevalence of male participation in maternal care was reported as low as 14% for ANC in Johannesburg, South Africa [16]; 27.1% for ANC in Nigeria [17] and 34% for ANC in Ethiopia [14]; 55.8% for PNC, even though only 41.5% participated in the PNC consultations in Kenya [18]; 65% for ANC in Uganda [19]. In Ghana, studies revealed that male involvement in maternal healthcare is about 30% for ANC, 44% for delivery and 20% for PNC [7]. Apart from poor knowledge and socio-cultural constraints [20,21], a number of socio-demographic and economic factors account for variations in the prevalence of male participation in maternal healthcare in different societies. Existing studies have employed quantitative techniques to determine the prevalence and socio-demographic correlates of male participation in maternal healthcare [15,22]. However, the existing evidence has largely been drawn from only cross-sectional studies which provide a one-time perspective on the phenomenon. Our study departs from this by assessing trends in male participation in ANC, delivery and PNC for seven years and the socio-demographic factors associated with male participation in maternal healthcare in the predominantly rural Jaman North District of Ghana.

Methods

Study setting

We conducted the study in the Jaman North District of the Bono Region of Ghana. The Jaman North District was purposely selected for the study because it recorded the highest rates of male involvement in maternal healthcare delivery between 2015 and 2018 in the Bono region [21,23]. As at 2020, the district had 21 public health facilities, comprising: one district hospital, 12 health centres, two clinics and six Community-based Health and Planning Services (CHPS) compounds providing maternal health services [21]. The rest of the health facilities (1 hospital, 1 clinic, 1 laboratory and over 33 chemical shops) were owned and managed by private sector providers. In 2016, the district recorded no institutional maternal mortality but 1.8% stillbirths [24]. Infant mortality increased from 1.1% in 2014 to 8.8% in 2017 and under-five mortality increased from 3.1% in 2014 to 5.6% in 2017 [25]. In 2018, 13,572 women attended ANC, with 2,173 institutional deliveries and 2,272 PNC attendance in the district [26]. The overall prevalence of facility-based deliveries increased from 56.7% in 2007 to 79.5% in 2017 in the entire Bono Region [27]. The Jaman North District has seven traditional areas which are headed by traditional authorities. The district is largely composed of two main ethnic groups, the Bonos, who constitute the majority of the population and the Nafanas (Nfantra) representing the minority group. The majority (83.5%) of the people are Christians [28]. Just like most Akan societies, the people of the Jaman North district practice the matrilineal system of inheritance.

Table 1
Proportional allocation of the sample size.

Health facilities	Number of mothers registered for PNC at selected facilities (2019)	Percentage (%)	Proportional Sample size.
Sampa Government Hospital	1322	58.8	222
Fountain Gare Hospital	577	25.7	97
Suma Presby Health Centre	79	3.5	13
Kokoa Health Centre	102	4.5	17
Asiri CHPS	107	4.8	18
Jamera CHPS	62	2.8	11
Total	2, 249	100	378

Study design and sampling strategy

The study adopted a two-phase quantitative research approach. In the first phase, longitudinal data from secondary sources were gathered to determine the trends in male participation in maternal healthcare between 2012 and 2019. In the second phase, a cross-sectional design was implemented in 2020 amongst 378 women receiving PNC from healthcare facilities to estimate the prevalence and determine socio-demographic correlates of male participation in maternal healthcare. Respondents were selected by stratifying the existing health facilities into hospitals, health centres and CHPS compounds. This allowed for purposive selection of one public and one private health facilities from each facility-based stratum, where possible. As documented elsewhere [21], the only two referral hospitals in the district thus; Sampa Government Hospital (public) and Fountain Gare hospital (private) were purposively selected to represent the hospital-based stratum. We also purposively selected a mission health centre (private) and one public health centre to represent the health centre stratum. Lastly, since all CHPS compounds are public in nature, we purposively selected the only two CHPS compounds in the district that were managed by midwives for inclusion in the study. The longitudinal study covered records of all males visiting the sampled facilities with their female partners for ANC, delivery and PNC between 2012 and 2019. The sample size for the cross-sectional phase was determined using the Yamane formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where: "n" is the minimum sample size being estimated; "N" is the target population (2433 PNC registrants); "e" is the worst acceptable margin of error (0.05 margin of error). The total population of mothers who registered for PNC in the district was 2433 in 2019 [26]. Thus

$$n = \frac{2433}{1 + 2433(0.05)^2} n = 344$$

The sample size of 344 mothers was increased by 10% to 378 to cater for non-responses. The sample was distributed proportionately amongst the sampled health facilities based on the number of mothers registered for PNC in each health facility (See Table 1). At the facility level, the mothers were systematically selected as they arrived and registered for PNC. The daily attendance registers for each facility represented the sampling frame. The first respondent was randomly selected from the list. Subsequent respondents were selected at a fixed and periodic interval of 5 until we arrived at the sample size.

Data collection

A two-stage data collection process was adopted. In the first stage, a data extraction sheet was designed and used to collect data on the numbers of women registered for, and the number of males who accompanied their female partners for, ANC, delivery, and PNC in each sampled facility between 2012 and 2019. The data were extracted from the records of each health facility and confirmed with data from the District Health Information Management System (DHIMS). Data extraction was done by the second author. In the second stage, a survey questionnaire was administered to the sampled mothers seeking PNC in the selected health facilities. The questionnaire covered socio-economic and demographic characteristics of the mothers including, age, education, marital status, employment status etc., and male partners' participation in ANC, delivery and PNC visits. Four trained field research assistants administered the questionnaire using the KoBoCollect software after the women had completed using the services and were exiting the facility. Each exit interview lasted between 30 and 45 min. The questionnaire was pretested amongst 10 mothers seeking PNC in a different facility within the district and the feedback was used to modify the wording of some questions and to assess the research assistants mastering of the KoBoCollect software or toolkit. Of the 378 mothers sampled for the survey, 318 (84%) completed the questionnaires.

Data analysis

Descriptive statistics were employed to describe the trends of male participation in maternal healthcare from 2012 to 2019. The rate of male participation was determined by the proportion of women who were accompanied by their male

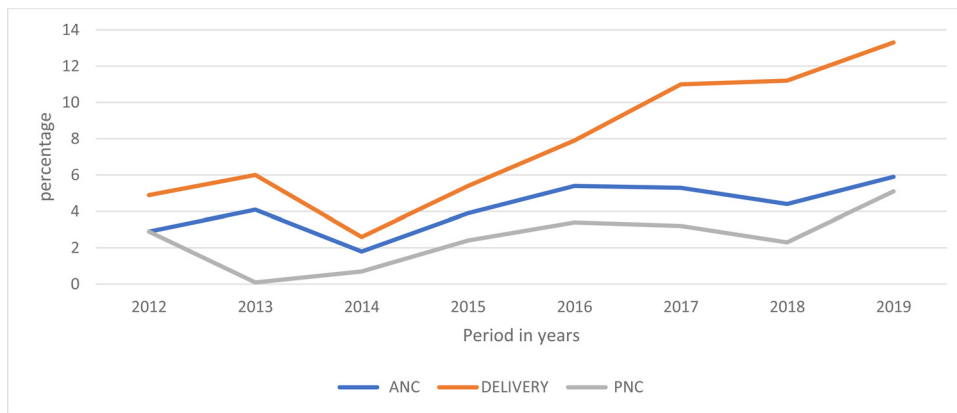


Fig. 1. Trends in male participation in maternal healthcare (2012–2019).

partners for each of the maternal care services for each year and in each type of healthcare facility. Line graphs were used to illustrate the trends of male participation for each year and in the various facilities, over the seven years.

Survey data were entered in Excel and exported to STATA 15 for analysis. Descriptive statistics (percentages or means/medians and standard deviations) were used to summarise the socio-economic and demographic characteristics of the respondents and the prevalence of male participation in maternal healthcare in the study sample. A bivariate analysis was done using the Pearson Chi-square test (χ^2) to determine the associations between male participation in maternal healthcare and their socio-economic and demographic characteristics. An alpha value of ≤ 0.05 was considered significant. Those socio-demographic characteristics that were statistically significantly associated with male participation in the bivariate analysis were included in a multivariate binary logistic regression modelling. The results of the logistic regression analysis are presented in adjusted odds ratios (AOR) within 95% confidence intervals (CI).

Ethics approval and consent to participate

The Kintampo Health Research Centre granted ethical approval for the conduct of the study (Ethics Approval ID: KHRIC/2021-10). Permission was also obtained from the Bono Regional Health Directorate, the Jaman North District Health Directorate, and the heads of all sampled health facilities. Informed consent was taken from all respondents before data collection. The research was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki).

Results

Socio-economic and demographic characteristics of the survey respondents

Table 2 shows the socio-economic and demographic characteristics of the respondents. The majority (70.75%) of the mothers were married, and the median age of the mothers was 27 years. The mean number of children and the years mothers spent with their partner were two and three respectively. About 29% of the mothers, had attained basic education whilst 43.08% of the male partners had attained at least secondary education. About 37% of the mothers and 51% of their male partners were self-employed. Also, the majority of the mothers (82.08%) were Christians. Approximately 39% of the mothers travelled to the maternal health facility on foot. Most of the mothers reported having no complications during pregnancy (77.36%), during delivery (95.91%), and after delivery (90.25%). The median monthly household income (1US\$:GH¢6.75) was GH¢800 (US\$118.44) with a mean income of GH¢1028.87 (\$152.32), while that of the median expenditure was GH¢400 (US\$59.22) with a mean of GH¢504.54 (US\$73.93).

Trends of male participation in maternal healthcare (2012–2019)

Fig. 1 illustrates the overall trends of male participation in ANC, delivery, and PNC. The results show a consistently higher participation rate of men in delivery, compared to ANC and PNC services. Remarkably, the participation rate of men in maternal healthcare fluctuated over the period under review. For example, male participation in delivery decreased from 4.1% in 2012 to 1.8% in 2014 and then increased to 13.3% in 2019.

Fig. 2a, b & c respectively illustrate the trends (2012–2019) of male participation in ANC, delivery, and PNC. Male participation in health centres sharply declined between 2013 and 2014 for all maternal healthcare services. Male participation at health centres for ANC has consistently increased while participation at health centres for both delivery and PNC fluctuated. Male participation in hospitals for ANC peaked between 2015 and 2016 but declined between 2017 and 2019. However, male

Table 2
Distribution of the socio-demographic and economic characteristics of the respondents.

Variable	Category	Frequency	Percentage
Age (years)	Early childbearing age (Below 25 years)	74	(23.27)
	Mid childbearing age (25–30 years)	172	(54.09)
	Late childbearing age (31 years & Above)	72	(22.64)
Marital Status	Not Married	93	(29.25)
	Married	225	(70.75)
Length of time stayed with a partner	3 years(median) and Below	166	(52.20)
	Above 3 years	152	(47.80)
Parity	No Child	120	(37.74)
	One child	112	(35.22)
	More than one child	86	(27.04)
Educational level of mother	No Formal Education	97	(30.50)
	Basic Education	125	(39.31)
	Secondary and Higher	96	(30.19)
Educational level of male partner	No Formal Education	66	(20.75)
	Basic Education	115	(36.16)
	Secondary and Higher	137	(43.08)
Religion	Islam/Traditional	57	(17.92)
	Christianity	261	(82.08)
Employment status	Unemployed	65	(20.44)
	Employee(public/private)	116	(36.48)
	Self-employed	137	(43.08)
Employment status of male partner	Unemployed	21	(6.60)
	Employee(public/private)	135	(42.45)
	Self-employed	162	(50.94)
Monthly income (GH)	GH800(median) and below	174	(54.72)
	Above GH800	144	(45.28)
Monthly expenditure(GH)	GH400 (median) and Below	167	(52.52)
	Above GH400	151	(47.48)
Number of wives of male partner	One wife	265	(83.33)
	More than one	53	(15.09)
Means of transport to the facility	On foot	125	(39.31)
	Motorcycle	114	(35.85)
	Car	79	(24.84)
Travel time to the facility	25 min(median) and Below	183	(57.55)
	Above 25 min	135	(42.45)
Time spent at facility	1 h(median) and Below	200	(62.89)
	Above 1 h	118	(37.11)
	No	246	(77.36)
Complications with pregnancy	Yes	72	(22.64)
	No	305	(95.91)
Complications with delivery	Yes	13	(4.09)
	No	287	(90.25)
Complications after birth	No	31	(9.75)
	Yes	31	(9.75)
TOTAL		318	100

participation at hospitals for delivery and PNC increased between 2014 and 2017, then declined in 2018 and increased again in 2019.

The prevalence of male participation in the survey sample

Fig. 3 revealed that 23.58% ($n = 75$) of the mothers were accompanied by their male partners to the facility for ANC, 52.52% ($n = 167$) were accompanied by their male partners for delivery and 31.76% (101) were accompanied by their male partners for PNC.

Socio- demographic characteristics of mothers and their male partners' participation in maternal healthcare

Table 3 presents the bivariate associations between mothers' basic characteristics and their male partners' participation in ANC, delivery and PNC. Table 4 presents the results of the logistic regression model estimation of the associations between male participation in maternal healthcare and those socio-economic and demographic characteristics that were statistically significantly ($p < 0.05$) associated with male participation in the various maternal healthcare services in the bivariate analysis presented in Table 3.

As shown in Table 4, compared to the mothers who were in the early childbearing age, those in the late childbearing age were nearly five times more likely to be accompanied by their male partners for ANC (AOR=4.728; 95% CI of 1.185–18.87). Compared to unmarried mothers, married mothers were nearly four times more likely to be accompanied by their

Table 3.
Bivariate association between mothers' basic characteristics and their male partners' participation in maternal healthcare.

Variable	Category	Male participation in ANC Freq (%)				Male participation in delivery Freq (%)				Male participation in PNC Freq (%)			
		Yes	No	χ^2	P-Value	Yes	No	χ^2	P-Value	Yes	No	χ^2	P-Value
Age (years)	< 25	65(87.84)	9(12.16)	14.835	0.001	34(45.94)	40(54.05)	2.502	0.286	51(68.92)	23(31.08)	3.311	0.191
	25-30	117(68.02)	55(31.98)			97(56.40)	75(43.60)			111(64.53)	61(35.47)		
	≥ 31	61(84.72)	11(15.28)			36(50.00)	36(50.00)			55(76.39)	17(23.61)		
Marital Status	Not married	79(84.95)	14(15.05)	5.308	0.021	52(55.91)	41(44.09)	3.746	0.053	62(66.67)	31(33.33)	0.150	0.699
	Married	164(72.89)	61(27.11)			99(44.00)	126(56.00)			155(68.89)	70(31.11)		
Years stayed with partner	≤ 3	105(63.25)	61(36.75)	33.383	0.000	70(42.17)	96(57.83)	3.935	0.047	100(60.24)	66(39.76)	10.250	0.001
	>3	138(90.79)	14(9.21)			81(53.29)	71(46.71)			117(76.97)	35(23.03)		
Parity	None	72(60.00)	48(40.00)	35.626	0.000	49(40.83)	71(59.17)	8.303	0.016	69(57.50)	51(42.50)	19.211	0.000
	1	89(79.46)	23(20.54)			50(44.64)	62(55.36)			74(66.07)	38(33.93)		
	≥ 2	82(95.35)	4(4.65)			52(60.47)	34(39.53)			74(86.05)	12(13.95)		
Educational level of mother	No formal	80(82.47)	17(17.53)	14.774	0.001	46(47.42)	51(52.58)	9.957	0.007	71(73.20)	26(26.80)	7.608	0.022
	Basic	103(82.40)	22(17.60)			71(56.80)	54(43.20)			91(72.80)	34(27.20)		
	Secondary+	60(62.50)	36(37.50)			34(35.42)	62(64.58)			55(57.29)	41(42.71)		
Educational level of male partner	No formal	61(92.42)	5(7.58)	14.980	0.001	54(39.42)	30(45.45)	6.321	0.042	51(77.27)	15(22.73)	3.508	0.173
	Basic	89(77.39)	26(22.61)			61(53.04)	54(46.96)			78(67.83)	37(32.17)		
	Secondary+	93(67.88)	44(32.12)			36(54.55)	83(60.58)			88(64.23)	49(35.77)		
Religion	Islam/Traditional	47(82.46)	10(17.54)	1.406	0.236	22(38.60)	35(61.40)	5.396	0.020	44(77.19)	13(22.81)	2.569	0.109
	Christianity	196(75.10)	65(24.90)			145(55.56)	116(44.44)			173(66.28)	88(33.72)		
Employment status of respondent	Unemployed	59(90.77)	6(9.23)	12.918	0.002	37(56.92)	28(43.08)	3.248	0.197	50(76.92)	15(23.08)	8.237	0.016
	Employee	78(67.24)	38(32.76)			50(43.10)	66(56.90)			68(58.62)	48(41.38)		
	Self-employed	106(77.37)	31(22.63)			64(46.72)	73(53.28)			99(72.26)	38(27.74)		
Employment status of male partner	Unemployed	11(52.38)	10(47.62)	8.105	0.017	7(33.33)	14(66.67)	4.832	0.089	12(57.14)	9(42.86)	1.912	0.384
	Employee	102(75.56)	33(24.44)			58(42.96)	77(57.04)			90(66.67)	45(33.33)		
	Self-employed	130(80.25)	32(19.75)			86(53.09)	76(46.91)			115(70.99)	47(29.01)		
Monthly income (GH)	\leq GHC800	144(82.76)	30(17.24)	8.580	0.003	87(50.00)	87(50.00)	0.975	0.323	125(71.84)	49(28.16)	2.298	0.130
	>GHC800	99(68.75)	45(31.25)			64(44.44)	80(55.56)			92(63.89)	52(36.11)		
Monthly expenditure (GH)	\leq GHC400	138(82.63)	29(17.37)	7.549	0.006	85(50.90)	82(49.10)	1.644	0.200	125(74.85)	42(25.15)	7.093	0.008
	> GHC400	105(69.54)	46(30.46)			66(43.71)	85(56.29)			92(60.93)	59(39.07)		
Number of wives of male partner	1	197(74.34)	68(25.66)	3.800	0.050	147(55.47)	118(44.53)	5.571	0.018	171(64.53)	94(35.47)	10.101	0.001
	>1	46(86.79)	7(13.21)			33(62.26)	20(37.74)			86(86.79)	7(13.21)		
Means of transport to the facility	On foot	104(83.20)	21(16.80)	6.406	0.041	76(60.80)	49(39.20)	23.763	0.000	86(86.79)	7(13.21)	6.095	0.047
	Motorcycle	79(69.30)	35(30.70)			29(29.82)	80(70.18)			95(76.00)	30(24.00)		
	Car	60(75.95)	19(24.05)			41(51.90)	38(48.10)			74(64.91)	40(35.09)		
Travel time to the facility	≤ 25 min	138(75.41)	45(24.59)	0.242	0.623	83(45.36)	100(54.64)	0.784	0.376	48(60.76)	31(39.24)	0.046	0.831
	> 25 min	105(77.78)	30(22.22)			68(50.37)	67(49.63)			124(67.76)	59(32.24)		
Time spent at facility	≤ 1 h	146(73.00)	54(27.00)	3.488	0.062	-	-	-	-	93(68.89)	42(31.11)	2.609	0.106
	>1hr	97(82.20)	21(17.80)			-	-			130(65.00)	70(35.00)		
Complications during Pregnancy	No	201(81.71)	45(18.29)	16.885	0.000	125(50.81)	121(49.19)	4.828	0.028	87(73.73)	31(26.27)	5.478	0.019
	Yes	42(58.33)	30(41.67)			26(36.11)	46(63.89)			176(71.54)	70(28.46)		

Table 4

A logistic regression model of mothers' socio-economic and demographic characteristics and their male partners' participation in maternal healthcare.

Variable	Categories	ANC			Delivery			PNC		
		AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Age (years)	Early childbearing age(Below 25 years)	Reference								
	Mid childbearing age(25–30 years)	2.654	0.945–7.453	0.064						
	Late childbearing age(31 years & above)	4.728	1.185–18.87	0.028						
Marital Status	Not Married	Reference								
	Married	3.261	1.259–8.443	0.015						
Length of time stayed with partner	3 years(median)and Below	Reference								
	Above 3 years	0.171	0.059–0.490	0.001	0.971	0.439–2.149	0.942	0.924	0.398–2.148	0.856
Parity	No Child	Reference								
	One child	0.439	0.172–1.122	0.086	0.955	0.470–1.939	0.898	0.692	0.325–1.470	0.338
	Two children & Above	0.108	0.019–608	0.012	0.520	0.194–1.397	0.195	0.240	0.081–	0.010
Educational level of respondent	No formal education	Reference								
	Basic education	0.648	0.255–1.647	0.362	0.426	0.221–0.821	0.011	0.817	0.435–1.533	0.528
	Secondary and higher	0.748	0.255–2.204	0.600	0.782	0.331–1.848	0.575	1.161	0.580–2.321	0.673
Educational level of male partner	No formal education	Reference								
	Basic Education	4.411	1.084–17.954	0.038	0.825	0.411–1.657	0.589			
	Secondary and Higher	4.871	1.147–20.689	0.032	1.371	0.590–3.184	0.463			
Religion	Islam/Traditional	Reference								
	Christianity				2.708	1.296–5.660	0.008			
Employment status of respondent	Unemployed	Reference								
	Employee(private/public)	4.209	1.273–13.919	0.019						
	Self-employed	2.979	0.832–10.675	0.094						
Employment status of male partner	Unemployed	Reference								
	Employee(private/public)	0.561	0.171–1.846	0.342						
	Self-employed	0.376	0.106–1.339	0.131						
Monthly income (GH)	GH800 (median) and below	Reference								
	Above GH800	1.242	0.447–3.451	0.677						
Monthly expenditure(GH)	GH400(median) and Below	Reference								
	Above GH400	1.023	0.371–2.823	0.965				2.114	1.202–3.718	0.009
Number of wives of male partner	One wife	Reference								
	More than one	0.591	0.238–1.471	0.259	0.648	0.300–1.397	0.268	0.343	0.139–0.848	0.020
Means of transport to the facility	On foot	Reference								
	Motorcycle	1.183	0.503–2.782	0.700	4.340	2.386–7.898	0.000	1.464	0.802–2.673	0.214
	Car	0.795	0.291–2.174	0.655	1.304	0.714–2.380	0.388	1.816	0.935–3.529	0.078
Complication with pregnancy	No	Reference								
	Yes	4.144	1.848–9.291	0.001	1.823	1.002–3.315	0.049	1.642	0.882–3.056	0.118
Observations		318			318			318		
Psuedo-loglikelihood		-112.12408			-190.71445			-175.05417		
Chi2		0.0000			0.0000			0.0000		
AIC		266.2482			407.4289			372.1083		

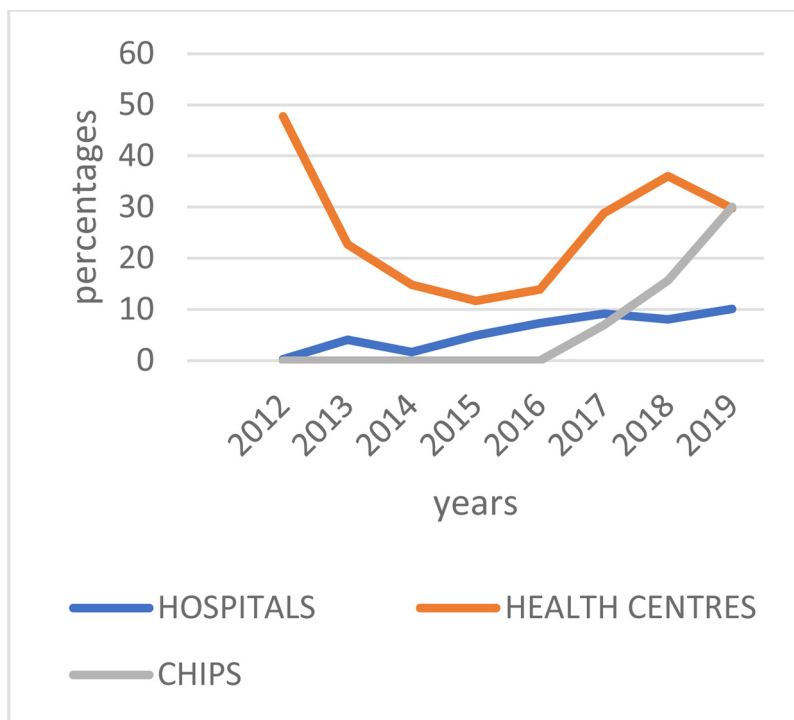
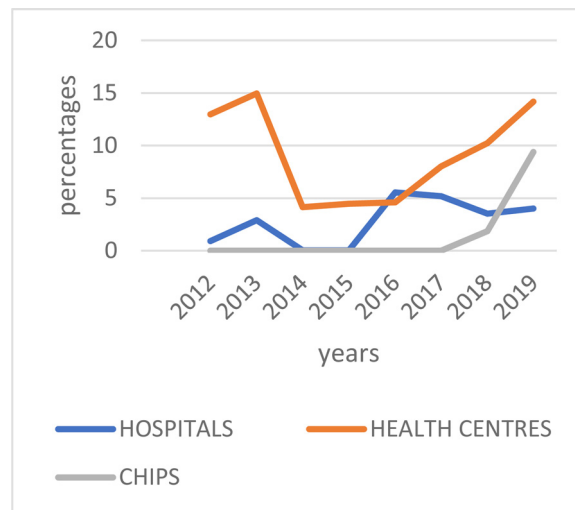


Fig. 2. a: Male participation in ANC, b: Male participation in delivery, c: Male participation in PNC.

male partners for ANC sessions (AOR= 3.261; 95% CI of 1.259–8.443). Mothers who had stayed with their male partners for three years and below were less likely to have their male partners accompany them for ANC (AOR= 0.171; 95% CI of 0.059–0.490) relative to mothers who had stayed with their partners for more than three years. Mothers with two or more children were less likely to experience male participation during ANC (AOR= 0.108; 95% CI of 0.019–608) and PNC (AOR= 0.240; 95% CI of 0.081–0.715) sessions compared to women who had either one or no child. The educational status of male partners was found to be a key predictor of male participation in ANC sessions of their spouses. For example, mothers whose male partners had attained basic education (AOR=4.411; 95% CI of 1.084–17.95), and secondary and above education (AOR=4.871; 95% CI of 1.147–20.689) were nearly five times more likely to have their male partners participate in their ANC sessions, compared to mothers whose male partners had no formal education. However, when it comes to childbirth, compared to mothers with no formal education, the mothers who had attained basic education were less likely to have their male partners participate in their delivery session (AOR=0.426; 95% CI of 0.221–0.821). Spouses of Christian women

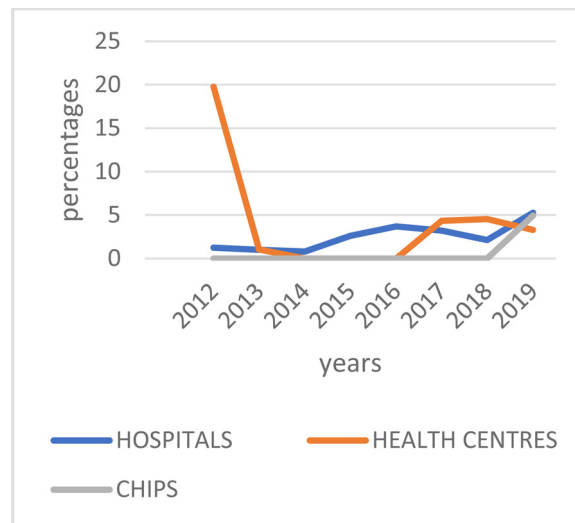


Fig. 2. Continued

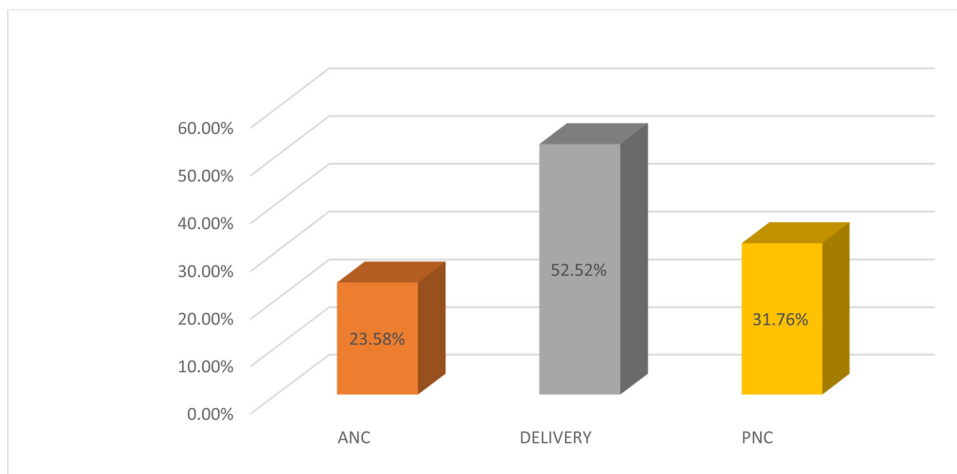


Fig. 3. Prevalence of male participation in the survey sample.

were nearly three times more likely to accompany them for delivery sessions (AOR=2.708; 95% CI of 1.296–5.660) compared to spouses of women belonging to the Islamic or Traditional religions. Mothers who were employed were four times more likely to experience male partners' participation in their ANC (AOR=4.209; 95% CI of 1.273–13.919) relative to unemployed women. Mothers whose monthly median household expenditure was above GHC400 were twice more likely to have their male partners accompany them for PNC sessions (AOR=2.114; 95% CI of 1.202–3.718) compared to mothers whose monthly median expenditure was GHC400 and below. The mothers whose male partners had more than one wife were less likely to have their male partners participate in their PNC sessions (AOR=0.343; 95% CI of 0.139–0.848) compared to those whose partners had only one wife. The results further showed that, compared to those who went to the health facility in a car, the mothers who went to the health facility on a motorcycle were nearly five times more likely to have their male partners accompany them for delivery (AOR=4.340; 95% CI of 2.386–7.898). Finally, compared to women who did not experience any complications during pregnancy, those who experienced complications during their pregnancies were four times more likely to have their male partners accompany them for ANC (AOR=4.144; 95% CI of 1.848–9.291) and delivery (AOR=1.823; 95% CI of 1.002–3.315).

Discussions

We examined the trends of male participation in maternal healthcare between 2012 and 2019 in a rural Ghanaian district. Confirming earlier studies, our results suggest that the rate of male participation in maternal healthcare is generally low [7,11,13,15,20].

Male participation in delivery has been consistently relatively higher compared to that of ANC and PNC. In earlier studies in Ghana, the number of male partners who accompanied their wives for delivery was higher than those who went for ANC and PNC [7]. Studies in Bangladesh reported that amongst women attending ANC during their most recent pregnancies, half of their husbands were physically present at the birthplace during the time of delivery [20]. Rahman et al. [20] reported that about two-thirds of women were accompanied by their husbands while receiving PNC. Both our study and Rahman et al. [20] confirm that more male partners accompany their wives for delivery than ANC and PNC services. Perhaps, the importance that men attach to the stage of delivery is explained by the fact that this stage is critical for the lives of both women and children. Falade-Fatila and Adebayo [29] found that close to 20% of men accompanied their wives to ANC and 20% also accompanied their wives for postnatal care. Falade-Fatila and Adebayo [29] and Gyan et al. [21] explained that work-related demands, social stigma and long waiting time at health facilities accounted for the non-involvement of men in maternal health care. Other studies have reported that maternal health care issues are considered as women's domain, hence the low participation of men in these issues [18,21].

The findings showed that male participation at the health centre level was relatively higher than the hospitals and CHPS. A plausible contextual explanation could be that since the CHPS compounds are located within the communities, women could easily walk to those facilities for maternal healthcare without the need for assistance from their male partners [30]. However, a significant proportion of the population lives in the subdistrict levels or peri-urban areas where most of the health centres are found but these health centres are not necessarily located within the communities of residence of all respondents but are often reachable on motorbikes or bicycles [19]. As such, males often have to carry their female partners on motorbikes or bicycles to these health facilities for maternal healthcare and hence the relatively higher rate of male participation at the health centres. However, the hospitals are located at the district capitals far away from the communities and most of the women visiting those facilities, would either be bypassing or referred by the lower-level facilities and hence may rely on public means of transport to such distant destinations [31] without the company of their male partners.

It is somewhat surprising to find the proportion of women accompanied by their male partners for PNC relatively higher than women accompanied for ANC. Nevertheless, the finding reflects the study of Rahman et al. [20] on the knowledge and participation of male partners in maternal healthcare in rural Bangladesh. Their study reported higher male participation in PNC compared to ANC. This finding could probably be a result of socio-cultural norms/values which prioritize the health of the baby to a greater degree compared to that of the mother [32]. Another possible explanation could be that male partners are more aware of the likely adverse effects of infant health outcomes compared to maternal health outcomes. In Kenya, studies established the lack of services targeting men at health facilities was a major roadblock for male involvement in ANC and PNC [18]. Ongolly and Bukachi [18] reported that men who accompanied their wives for ANC and PNC ended up only sitting and waiting because the health care providers only actively engaged their partners, thereby making the men feel excluded in care decisions. The likely resultant outcome is that it may affect the successful implementation of a policy/programme, in circumstances where male participation in PNC is being used as an entry point to design strategies to improve the prioritisation of maternal healthcare during ANC and PNC [21]. On the contrary, this finding does not support previous research [7,19] that reported relatively higher levels of male participation in ANC compared to PNC.

Contrary to expectations, the results showed that mothers who were in their late childbearing age were more likely to have their male partners accompany them for ANC. This finding contradicts that of Mohammed et al. [11] who reported that mothers in their late childbearing age were less likely to have their male partners participate in their maternal healthcare. This finding was somehow surprising since mothers in their late childbearing age would have gained experience from a previous pregnancy and delivery compared to the mothers in their early childbearing ages [21]. The latter is likely to be anxious about pregnancy. However, it could be argued that mothers at this age might not have much strength to attend maternal healthcare alone, hence the reason for their male partner's participation in ANC.

Again, the study found that women who were married (compared to unmarried) were more likely to be accompanied by their male partners for ANC. This finding was in line with observations of other researchers [10,33]. A possible explanation for this result may be the negative attitudes and perceptions towards cohabitation and pregnancies that ensued out-of-wedlock in Ghana [34]. In most African societies, pregnancies before marriages are considered shameful and frowned upon by the public, and this may challenge spouses who are not married to jointly attend ANC [34]. Also, further analysis of the study revealed that the mothers who had stayed with their partners for more than three years (compared to three years and below) and had relatively high parity (two children and above compared to no child and one child) were less likely to be accompanied by their male partners for ANC and PNC. This finding was somehow not surprising since such mothers would have already been exposed to pregnancy and childbirth-related issues hence have the knowledge to go through subsequent ones [21].

Interestingly, the study showed that mothers whose partners' educational levels were either basic or secondary and higher (compared to no formal education) were more likely to have their male partners participate in their ANC. Perhaps, men who had formal education have some levels of knowledge about reproductive healthcare or might have noticed some changes within the female partner thereby prompting them to visit the facility with her to report these changes to the healthcare provider. Male partners with formal education are also probably able to overcome socio-cultural norms related to pregnancy and childbirth; hence they can accompany their partners for maternal healthcare without fear of stigmatisation [21,35]. Our finding supports the findings of similar studies on male participation in maternal healthcare [36]. The authors indicated that male partners who have at least formal education were more likely to accompany their partners for maternal care.

In line with the observations of Namayanja [37], the study found that mothers who were employees (compared to unemployed) were more likely to be accompanied by their male partners for ANC. This could be justified that since they are employees of private entities or government agencies, they have frequent job schedules without adequate time for acceptable healthcare practices. As a result, their male partners would like to support them towards birth preparedness to avoid depression [38].

The study also found that mothers who had complications during pregnancy compared to those who did not have any complications were more likely to be accompanied by their male partners for ANC and delivery. Gabrysch and Campbell [39] reported that mothers who have complications require extra care and attention, which demands that their male partners follow them to the facility for medical advice. Because male partners are already aware of their female partners' complications, they will accompany their partners for delivery to support them psychologically and help pay for the cost of the service if the need be.

Consistent with the literature, mothers who were Christians, compared to those who were Muslims /traditionalists, were more likely to be accompanied by their male partners for delivery. This can be attributed to the different beliefs and practices of these religious groups which allow and forbid its members from engaging in acts, in accordance or contrary to their religious teachings [40]. Comparison of the findings with those of other studies [33,41,42] confirms that those female partners who belong to the Christian faith were more likely to be accompanied for delivery by their male partners than their other counterparts. Also, mothers who go to the facility on motorcycles were more likely to be accompanied by their male partners since male partners usually ride them to the facility by themselves and wait for them to deliver [43]. The study also found that mothers with a monthly household expenditure of above GHC 400 compared to those with a monthly expenditure of GHC 400 and below were more likely to be accompanied by their male partners. This finding is consistent with the study of Chapagain [15] who reported that households with higher expenditure were six times more likely to have a joint attendance for maternal healthcare.

Limitations of the study

As a facility-based survey, the study was biased against mothers who did not attend PNC. The views of Mothers who attended ANC and/delivered at healthcare facilities but did not attend PNC probably because of experiences of stillbirths or neonatal mortalities were not captured in the study. Our conceptualisation of male participation in maternal healthcare was limited to men accompanying their female partners to healthcare facilities for maternal healthcare. Future studies should assess other indicators of male participation including the emotional, physical and financial support that men provide to their partners during the period of pregnancy, delivery and after birth.

Conclusions

Generally, the study revealed low participation of male partners in the various forms of maternal healthcare across all healthcare facilities over the seven years. Socio-economic and demographic correlates of male participation in the various maternal healthcare services include maternal age, marriage, employment, education, parity, religion, pregnancy complications, means of transport to the health facility and monthly income. Men must be made to understand their responsibilities in the maternal care processes since they are key decision-makers in patriarchal societies. Community-level educational programmes relying on contextual appropriate innovative communication channels such as drama and community level durbars on the importance of male participation should be targeted at the less educated, Muslims, newly married, low income and polygynous homes.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRedit authorship contribution statement

Gilbert Abotisem Abihiro: Conceptualization, Visualization, Formal analysis, Writing – original draft, Writing – review & editing. **Emmanuel Kofi Gyan:** Visualization, Supervision, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Kennedy A. Alatinga:** Writing – original draft, Writing – review & editing. **Roger A. Atinga:** Writing – original draft, Writing – review & editing.

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