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Paternal Values towards Women's Empowerment and its Associations with Maternal and Paternal Antenatal Care Attendance among Sub–saharan African Population 2010-2014

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ABSTRACT

Background & aim: Increased paternal engagement in antenatal care and birth positively influences pregnancy outcomes. There is very little research that describes the men's value of the reproductive health of their partner and its impact on paternal engagement in preconception, antenatal, and postpartum care. The purpose of this study was to examine the potential associations of paternal values towards women's empowerment (PVWE) with maternal and paternal antenatal care (ANC) attendance.

Methods: Secondary analysis of a men's survey conducted by the Demographic and Health Surveys (2010-2014) (n=26892). A retrospective analysis of observational data collected as part of a prospective census survey was performed. An empowerment instrument was created ad hoc using four available variables. Nine sub-Saharan countries were included. Surveys obtained via stratified sampling with varying probability using weight distributions. Data were pooled into an aggregate dataset and examined through various regression methods.

Results: PVWE was positively associated with maternal antenatal care. Lower PVWE was associated with lower likelihood that women attend ANC. PVWE was also positively associated with paternal antenatal care attendance. Lower versus higher PVWE was associated with lower likelihood that fathers attended ANC.

Conclusion: PVWE is positively associated with maternal and paternal antenatal care attendance. Men's values of the reproductive rights of their partner may contribute to antenatal care attendance or antenatal care may shape men's values of women. Further research can build upon this study to provide more insight as to how masculinity shapes men's values of the respective rights of women.

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Introduction

Every year, it is estimated that more than 303,000 women die from pregnancy or childbirth-related causes worldwide (1). In 2019, almost five million infants died from preventable causes such as preterm and intrapartum birth complications, pneumonia, and diarrhea (2). Worldwide, 73% of all deaths of children under the age of five occur during the first year of life (2). One strategy recommended by the World Health Organization to reduce maternal and infant mortality is to promote attainment of antenatal medical care, with one significant milestone being eight antenatal care (ANC) visits (3). Many investigations have shown that antenatal care is an effective intervention in improving pregnancy outcomes (4).

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Worldwide, however, about 85% of women attend at least one ANC visit, while only about 58% achieve the previously recommended four visit minimum (5). Many barriers to ANC attendance are structural (cost, access and availability), which are on the agendas of national health ministries and nongovernmental organizations. Low paternal involvement can also be a barrier, not only by hampering a woman's ability to seek antenatal medical care, but also by increasing a woman's overall burden, especially if she must care for dependents.

Available literature indicates that increased male engagement in ANC and birth positively influences pregnancy outcomes, with associated reductions in negative maternal health behaviors and rates of low birth weight, fetal growth restriction, preterm birth, and infant mortality (6). There is epidemiological evidence that male involvement reduces maternal stress (by emotional, logistical, and financial support) as well as increases the uptake of ANC (7). Additionally, paternal participation leads to improved communication between couples, provides opportunities for men to learn about the health needs of mothers and infants, and supports paternal involvement in their future parental roles from an early stage (8). Despite the evidence of their importance, antenatal programs continue to suffer from low participation rates among fathers (9-10).

Although much is known about the benefits of paternal participation in ANC, there is very little research that describes constructions of masculinity and its impact on paternal engagement in preconception, antenatal, and postpartum care (11). Little is known about the relationships between paternal participation in ANC and paternal perceptions and knowledge of women's empowerment, partner's reproductive health, HIV/STI transmission, domestic violence, and contraception. These relationships are vital to understand because they can reveal how particular norms of masculinity influence reproductive health.

The United Nations (UN) Commission on the Status of Women concluded that men are key to the health of the family and must be active participants in ANC as well as many aspects of pregnancy health (12). The commission further concluded that individual men are often dismissed or blamed for low engagement without adequately questioning the social and contextual constructions of gender relations that lead to gender inequalities (12).

This study examines whether paternal values of women's empowerment are linked with maternal and paternal ANC attendance. This is important to explore because it is known that women with male partners with non-egalitarian values of the human right to reproductive health have poorer health outcomes than those who have more egalitarian values of that right (13). However, it remains unknown whether men who have more egalitarian values of women's reproductive health also demonstrate egalitarian values of their partner's access to antenatal care. Additionally, it is unknown if men who have more egalitarian values of women also participate in ANC in the form of antenatal clinic attendance.

Women's empowerment can be a nebulous concept and is often difficult to define (14). The authors have decided to use the conceptualization of empowerment as articulated by Kabeer (1999, 2001) who conceptualizes empowerment "the expansion of people's ability to make strategic life choices in a context where this ability was previously denied to them" (15-16). Several studies have operationalized the Kabbir (15-16) concept of empowerment in a variety of different ways depending on the context (17-18). Such studies have ranged from measuring empowerment in the forms of economic indicators to political participation (17-18). In the current study, we define women's empowerment as a woman's decision-making power over her reproductive health. Thus, paternal values of women's empowerment (PVWE) are defined as men's values of a woman's decision-making power regarding her reproductive health.

Little is known about the relationships between paternal values/knowledge of: women's empowerment and maternal and paternal participation in ANC. The strength of these relationships may be vital to understand because they can reveal how particular norms of masculinity may influence different areas of reproductive health. Furthermore, it is unclear if male sexual norms associated with specific

masculinist values of women's empowerment and gender relations can be present and compatible with paternal participation in ANC. Some culturally constructed forms of masculinity may be incompatible with men's participation in antenatal care, while others may coexist.

It is known that the lower the men's perception of women, the more power, resources, authority, and control he has over his partner (19). It is unknown if a father's participation in ANC acts as a moderator in other domains of reproductive health.

In the environments where maternal and infant mortality are highest, men tend to embody characteristics that prepare them to combat against possible threats (violence, theft, racism, poverty) (20). Preserving masculinity is of the utmost importance for men in such environments (20). It is not clear how men's embodied identity as men shapes their participation in ANC. To date, there have not been any studies to examine men's value of women and associations with health-related behaviors such as antenatal care attendance.

The purpose of this study was to investigate whether paternal values of women's empowerment are associated with maternal and paternal antenatal clinic attendance.

Materials and Methods

In this secondary analysis, the datasets of men's Demographic and Health Survey (DHS) (2010-2014) (N=26892) of nine Sub-Saharan African countries were included in the analysis. These nine centuries consisted of Burkina Faso, Congo Democratic Republic, Liberia, Malawi, Nigeria, Rwanda, Sierra Leone, Zambia, and Zimbabwe. The nine countries were chosen based on having met each of the following inclusion criteria 1) conducted a DHS in the year 2010 or later 2) included a men's survey measuring antenatal accompaniment and women's empowerment questions regarding reproductive health.

The inclusion of the nine countries provides a diverse pool for examining women's empowerment in relation to paternal involvement. Per the United Nations Development Programme (UNDP), sub-Saharan Africa has the highest gender inequality in the world, measured by aspects of reproductive health and women's participation in government, higher education, and the labor market (21). Sub-Saharan Africa bears >95% of the global burden of maternal mortality and morbidity (22). The UNDP gender inequality index represents the loss in human development due to gender inequality, where 1 represents full equality and 0 indicates the lowest possible status for women (Table 1).

Table 1. UNDP gender inequality index

Country	Index Score
Burkina Faso	0.402
Congo Democratic Republic	0.592
Liberia	0.427
Malawi	0.476
Nigeria	0.527
Rwanda	0.498
Sierra Leone	0.420
Zambia	0.579
Zimbabwe	0.516
United States	0.920

The nine countries were grouped into three geographic regions based on United Nations designated geo-political boundaries to achieve an adequate sample. The Democratic Republic of Congo and Rwanda were considered Central Africa; Malawi, Zimbabwe, and Zambia were pooled to form Southern Africa, and Burkina Faso, Liberia, Nigeria, and Sierra Leone were considered West Africa in this study.

To examine the association between PVWE and antenatal care attendance, we used the men's Demographic and Health Survey (DHS). The men's survey dataset represents completed interviews of a subset of men within a household. To determine the analytical sample, we included men aged 15 to 49 from the men's dataset who had fathered a child within two years prior to the survey and who had non-missing data for all empowerment items and the outcome. Country level analytic samples included Burkina Faso (n=2066), Congo Democratic Republic (n=3001), Liberia (n=1327), Malawi (n=2845), Nigeria (n=4060), Rwanda (n=1712), Sierra Leone (n=2066), Zambia (n=4701), and Zimbabwe (n=1652), Total n = 23430.

Maternal and paternal clinic attendance were used as outcome variables.

In the DHS, the respondent was asked if the mother of his child attended at least one antenatal appointment for their youngest child (under two years of age). The follow-up question asked if the respondent attended at least one ANC appointment with the mother of his child.

Paternal values of women's empowerment were measured as a composite score, ranging from 0-4, where 0 represented "Low view of women's empowerment/status of women" and 4 represented "high view of women's empowerment/ status of women." The index was a single section containing four questions asked of every man in the survey. The index was a single section containing four questions asked of every man in the survey including a) contraception is woman's business; man should not worry, b) women who use contraception become promiscuous, c) wife could justify refusing sex if the husband has other women and d) wife could justify asking husband to use condoms if he has STI.

A man could receive a score from 0-4 depending on how he responded to the four dichotomous questions. The low view of the status of women was analogous to norms of masculinity that placed low value on women while the high view of the status of women was analogous to more progressive forms of masculinity that tended to have more equitable values of women as persons with human and reproductive rights. Paternal values of women's empowerment are referred to as the "PVWE index" in the analysis and discussion sections. There was no validity and reliability information available for the ad hoc instrument.

Prior research has shown that age, educational level, fathering children with multiple partners, religion, wealth, number of wives/ partners, country, and urban vs rural geographic locations have been associated with maternal clinic attendance and paternal values of women's empowerment. The adjustment variables is referred to as simply "adjustment variables" for the remainder of the text.

Data were analyzed using SAS 9.3 (Carey, NC). Nine separate country specific data sets were downloaded from DHS website and imported into SAS. First, we described the sample characteristics for each country using DHS sample weights, adjusting for differences in the probability of selection from the survey design. Second, countries were combined based on their geographic region in Africa (Western, Central, Southern). To address if maternal ANC attendance was associated with paternal beliefs of women's decision-making power, a logistic model was created first using maternal ANC attendance as the outcome variable and the empowerment index as the explanatory variable using the adjustment variables. The same logistic model was used again, this time pooling all nine countries in the analysis. The regional and combined pooled datasets allowed for an adequate sample size to conduct the analysis. To address if there is an association between paternal ANC attendance and paternal beliefs of women's decision-making power, the same processes were used, substituting the maternal ANC visit variable for the paternal ANC variable. All analyses were adjusted for the complex survey design to correct the variance estimations. Odds ratios were considered statistically significant at $p < 0.05$.

The Institutional Review Board of Emory University determined this study to be exempt.

Results

Table 2 contains the sample demographic characteristics by country. The mean age of fathers in the study ranged from 33 years in Liberia to 37 years in Burkina Faso. Education and religion patterns varied considerably among the nine countries in the study. Urban residence in all nine countries ranged from 10.4% in Malawi to 35.6% in Zambia. Table 3 shows the sample demographic characteristics by region and as composite data set. The mean age for all three regions was similar.

The aggregate data set has a mean age of 34.67 (± 8.11). Islam, Catholicism, and Protestantism are the predominant religions in the Western, Central, and Southern regions respectively.

In the aggregate data set, Islam is the predominant religion (28.1%) followed closely by Protestantism (22.8%) and non-specific Christian religions (22.6%). Most men in the sample (63.1-66.7%) have fathered children with only one partner. Approximately 74.3 -

Table 2. Demographic characteristics by country

Region	Western Africa	Central Africa	Western Africa	Southern Africa	Western Africa	Central Africa	Western Africa	Southern Africa	Southern Africa
Country	Burkina Faso	DRC	Liberia	Malawi	Nigeria	Rwanda	Sierra Leone	Zambia	Zimbabwe
Year	2010	2013-2014	2013	2010	2013	2010	2013	2013-2014	2010-2011
Sample Size (N)	2856	3430	1400	3015	5419	1734	2184	4954	1900
Age (Years)	37.33 ± 8.90	34.91 ± 8.56	33.06 ± 7.46	33.23 ± 7.84	35.59 ± 6.99	33.57 ± 8.22	35.72 ± 8.89	34.02 ± 8.12	32.54 ± 7.27
Education									
No Education	2150 (75.3)	177 (5.2)	256 (18.3)	255 (8.5)	1543 (28.5)	286 (16.5)	1276 (58.4)	274 (5.5)	13 (0.7)
Incomplete Primary	335 (11.7)	625 (18.2)	366 (26.1)	1676 (55.6)	307 (5.7)	977 (56.3)	179 (8.2)	1427 (28.8)	189 (9.9)
Complete Primary	103 (3.6)	287 (8.4)	63 (4.5)	261 (8.7)	905 (16.7)	263 (15.2)	86 (3.9)	933 (18.8)	291 (15.3)
Incomplete Secondary	207 (7.2)	1423 (41.5)	456 (32.6)	433 (14.4)	561 (10.4)	132 (7.6)	420 (19.2)	1428 (28.8)	1225 (64.5)
Complete Secondary	22 (0.8)	690 (20.1)	198 (14.1)	320 (10.6)	1300 (24.0)	41 (2.4)	133 (6.1)	527 (10.6)	57 (3.0)
Higher	39 (1.4)	228 (6.6)	61 (4.4)	70 (2.3)	803 (14.8)	35 (2.0)	90 (4.1)	364 (7.3)	125 (6.6)
Religion	2856	3430	1400	3015	5419	1734	2184	4953	1900
No religion	3 (0.0)	91 (2.7)	43 (3.1)	87 (2.9)	0 (0.0)	36 (2.1)	1 (0.1)	0 (0.0)	466 (43.3)
Muslim	1766 (61.9)	75 (2.2)	191 (13.7)	327 (10.9)	3062 (56.8)	22 (1.3)	1805 (82.8)	35 (0.7)	13 (1.2)
Catholic	614 (21.5)	927 (27.1)	0 (0.0)	621 (20.6)	464 (8.6)	780 (45.0)	0 (0.0)	894 (18.1)	155 (14.4)
Protestant	151 (5.3)	992 (29.0)	0 (0.0)	0 (0.0)	0 (0.0)	655 (37.8)	0 (0.0)	3937 (79.9)	197 (18.3)
Traditional/ Animist	318 (11.2)	24 (0.7)	33 (2.4)	0 (0.0)	65 (1.2)	0 (0.0)	1 (0.1)	0 (0.0)	107 (10.0)
Non-specified Christian	0 (0.0)	1171 (34.2)	1128 (80.9)	1270 (42.1)	1795 (33.3)	0 (0.0)	367 (16.8)	0 (0.0)	133 (12.4)
Other	0 (0.0)	147 (4.3)	0 (0.0)	709 (23.5)	9 (0.2)	241 (13.9)	6 (0.3)	63 (1.3)	4 (0.4)
Total	2852	3427	1395	3014	5395	1734	2180	4929	1075
Wealth									
Poorest	533 (18.7)	842 (24.5)	487 (34.8)	545 (18.1)	1112 (20.5)	338 (19.5)	530 (24.3)	1105 (22.3)	415 (21.8)
Poorer	601 (21.0)	831 (24.2)	393 (28.1)	682 (22.6)	1135 (20.9)	345 19.9)	465 (21.3)	1256 (24.4)	364 (19.2)
Middle	591 (20.7)	756 (22.0)	261 (18.6)	704 (23.3)	1028 (19.0)	360 (20.8)	450 (20.6)	1081 (21.8)	371 (19.5)
Richer	615 (21.5)	594 (17.3)	153 (10.9)	608 (20.2)	1087 (20.1)	348 (20.1)	419 (19.2)	876 (17.7)	414 (21.8)
Richest	516 (18.1)	407 (11.9)	106 (7.6)	476 (15.8)	1057 (19.5)	342 (19.8)	320 (14.7)	636 (12.8)	336 (17.7)
Geographic location	2856	3430	1400	3015	5419	1733	2184	4954	1900
Urban	681 (23.8)	936 (27.3)	417	315 (10.4)	1872 (34.5)	262 (15.1)	612 (28.0)	1763 (35.6)	571 (30.1)

Region	Western Africa	Central Africa	Western Africa	Southern Africa	Western Africa	Central Africa	Western Africa	Southern Africa	Southern Africa
			(29.8%)						
Rural	2175 (76.2)	2494 (72.7)	983 (70.2%)	2700 (89.6)	3547 (65.5)	1472 (84.9)	1572 (72.0)	3191 (64.4)	1329 (69.9)
Number of Women fathered children with	2856	3430	1400	3015	5419	1734	2184	4954	1900
1	1705 (59.7)	2017 (58.8)	703 (50.2)	1992 (66.1)	2869 (71.4)	1395 (80.4)	1210 (55.4)	3200 (64.6)	1389 (73.1)
2	846 (29.6)	1007 (29.4)	500 (35.7)	796 (26.4)	1227 (22.6)	301 (17.4)	705 (32.3)	1354 (27.3)	403 (21.2)
3 or more	304 (10.6)	402 (11.7)	197 (14.1)	220 (7.3)	298 (5.5)	36 (2.1)	264 (12.1)	395 (8.0)	108 (5.7)
Number of wives/ partners	2855	3426	1400	3008	4394	1732	2179	4949	1900
No current wife/partner	36 (1.4)	166 (4.8)	141 (10.1)	115 (3.8)	119 (2.2)	79 (4.6)	134 (6.1)	355 (7.2)	96 (5.1)
1	1948 (68.2)	2728 (79.5)	1156 (82.6)	2627 (87.1)	4187 (77.3)	1613 (93.0)	1516 (69.4)	4209 (85.0)	1701 (89.5)
2 or more wives	872 (30.5)	536 (15.6)	103 (7.4)	273 (9.1)	1113 (20.5)	42 (2.4)	534 (24.5)	390 (7.9)	103 (5.4)
Total	2856	3430	1400	3015	5419	1734	2184	4954	1900

Table 3. Demographic characteristics by region and aggregate of all nine countries

Country	Western Africa	Central Africa	Southern Africa	Aggregate
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size (N)	11859	5164	9869	26892
Age (Years)	35.74 ± 8.00	34.4 6 ± 8.47	33.49 ± 7.89	34.67 ± 8.11
Education				
No Education	5225 (44.1)	463 (9.0)	542 (5.5)	6239 (23.2)
Incomplete Primary	1187 (10.0)	1602 (31.0)	3292 (33.4)	6081 (22.6)
Complete Primary	1157 (9.8)	550 (10.7)	1485 (15.0)	3192 (11.9)
Incomplete Secondary	1644 (13.9)	1555 (30.1)	3086 (31.3)	6285 (23.4)
Complete Secondary	1653 (13.9)	731 (14.2)	904 (9.2)	3288 (12.2)
Higher	993 (8.4)	263 (5.1)	559 (5.7)	1815 (6.7)
Total	11859	5164	9868	26891
Religion				
No religion	47 (0.4)	127 (2.5)	553 (6.1)	727 (2.8)
Muslim	6824 (57.7)	97 (1.9)	375 (4.2)	7296 (28.1)
Catholic	1078 (9.1)	1707 (33.1)	1670 (18.5)	4455 (17.1)
Protestant	151 (1.3)	1647 (31.9)	4134 (45.8)	5932 (22.8)
Traditional/ Animist	417 (3.5)	24 (0.5)	107 (1.2)	548 (2.1)
Non-specified Christian	3290 (27.8)	1171 (22.7)	1403 (15.6)	5864 (22.6)
Other	15 (0.1)	388 (7.5)	776 (8.6)	1179 (4.5)
Total	11822	5161	9018	26001
Wealth				
Poorest	2662 (22.4)	1180 (22.9)	2065 (20.9)	5907 (22.0)
Poorer	2594 (21.9)	1176 (22.8)	2302 (23.3)	6072 (22.6)
Middle	2330 (19.6)	1116 (21.6)	2156 (21.8)	5602 (20.8)
Richer	2274 (19.2)	942 (18.2)	1898 (19.2)	5114 (19.0)
Richest	1999 (16.9)	750 (14.5)	1448 (14.7)	4197 (15.6)
Total	11859	5164	9869	26892
Geographic location				
Urban	3582 (30.2)	1198 (23.2)	2649 (26.8)	7429 (27.6)
Rural	8277 (69.8)	3966 (76.8)	7220 (73.2)	19463 (72.4)
Total	11859	5164	9869	26892
Number of Women fathered children with				
1	7487 (63.3)	3412 (66.1)	6581 (66.8)	17480 (65.1)
2	3278 (27.8)	1308 (25.4)	2553 (25.9)	7139 (26.6)
3 or more	1063 (8.9)	438 (8.5)	723 (7.3)	2224 (8.3)
Total	11828	5158	9857	26843
Number of wives/ partners				
No current wife/partner	430 (3.6)	245 (4.7)	566 (5.7)	1241 (4.6)
1	8807 (74.3)	4341 (84.1)	8537 (86.5)	21685 (80.6)
2 or more wives	2622 (22.1)	578 (11.2)	766 (7.8)	3966 (14.8)
Total	11859	5164	9869	26892

86.5% of the men in the sample had only one partner at the time of the survey.

Table 4 shows how the key variables of interest are distributed among the various regions in the study. Most of the men in the study fall in the "High" empowerment category. Maternal ANC visits (at least 1) ranged from 86.2% in the western African countries to 93.4% in the southern African countries. This is comparable to other studies surveying maternal ANC attendance. (23) Paternal ANC attendance ranged from 47.4% in Western Africa to 54.0% in Southern Africa.

Table 4. Distribution of key variables: PVWE & ANC attendance

Country	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Lowest Empowerment "0"	319 (2.7)	166 (3.2)	205 (1.1)	590 (2.2)
Low-Medium Empowerment "1"	724 (6.1)	410 (7.9)	557 (5.6)	1691 (6.3)
Medium Empowerment "2"	2796 (23.6)	892 (17.3)	1942 (19.7)	5630 (20.9)
Medium- High Empowerment "3"	3639 (30.7)	1426 (27.6)	3091 (31.3)	8156 (30.3)
Highest Empowerment "4"	4344 (36.6)	2267 (43.9)	4161 (42.2)	10772 (40.1)
Total	11822	5161	9956	26839
Maternal ANC Attendance				
No	1530 (13.0)	400 (7.7)	586 (5.9)	2516 (9.4)
Yes	10224 (87.0)	4720 (92.3)	9217 (94.1)	24161 (90.6)
Total	11754	5120	9803	26677
Paternal ANC Attendance				
No	5358 (52.6)	2272 (48.2)	4227 (46.0)	11857 (49.2)
Yes	4824 (47.4)	2441 (51.8)	4971 (54.0)	12236 (50.8)
Total	10182	4713	9198	24093

Table 5 shows the relationship between the PVWE index and maternal ANC attendance. Lower PVWE is associated with lower likelihood that women attend ANC. This association is significant and graded in the pooled analysis with all countries, as well as in region-specific analysis of Central African countries. The pattern is consistent but not significant in other region-specific analyses.

Table 5. Odds ratios and 95% confidence intervals of maternal ANC attendance by PVWE after demographic characteristic adjustment

Region	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Lowest Empowerment vs	1.04	**0.20**	0.39	**0.62**
Highest empowerment	(0.63 - 1.73)	(0.10 - 0.39)	(0.15 - 1.01)	(0.42 - 0.90)
Low-Medium Empowerment vs	0.83	**0.33**	**0.59**	**0.69**
Highest Empowerment	(0.59 - 1.17)	(0.20 - 0.56)	(0.39 - 0.89)	(0.54 - 0.87)
Medium empowerment vs	0.81	**0.27**	0.86	**0.68**
Highest empowerment	(0.66 - 1.01)	(0.13 - 0.57)	(0.64 - 1.15)	(0.56 - 0.82)
Medium-High Empowerment vs	**0.81**	**0.59**	0.95	**0.82**
Highest Empowerment	(0.66 - 0.98)	(0.41 - 0.85)	(0.73 - 1.23)	(0.71 - 0.95)

Table 6 shows the relationship between the PVWE index and paternal clinic attendance. In the pooled analysis of all nine countries, lower versus higher PVWE was associated with lower likelihood that fathers attended ANC, with the exception of the lowest PVWE score of '0', which was also the least common score. In region-specific analyses, Central and Southern African nations tended to have lower paternal ANC attendance with lower PVWE, although not all associations were significant. In Western Africa, results were more mixed with the contradictory result of the lowest empowerment group reporting significantly greater paternal ANC attendance.

Table 6. Odds ratios and 95% confidence intervals of paternal ANC attendance by PVWE after demographic characteristic adjustment

Region	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Lowest Empowerment vs Highest empowerment	**1.68** (1.17 – 2.42)	0.61 (0.32 - 1.15)	0.88 (0.55 - 1.39)	1.00 (0.77 - 1.30)
Low-Medium Empowerment vs Highest Empowerment	0.94 (0.73 - 1.19)	0.66 (0.44 - 1.00)	0.83 (0.66 - 1.04)	**0.74** (0.63 - 0.86)
Medium empowerment vs Highest empowerment	1.06 (0.91 - 1.24)	**0.53** (0.37 - 0.74)	1.01 (0.87 - 1.16)	**0.83** (0.75 - 0.92)
Medium-High Empowerment vs Highest Empowerment	0.93 (0.82 - 1.07)	**0.67** (0.52 - 0.87)	1.04 (0.92 - 1.17)	**0.85** (0.78 - 0.92)

Discussion

According to the results of this study, a positive association between PVWE and maternal and paternal ANC attendance was found. In our analysis, the greater a man values a woman's decision-making power (higher PVWE), the greater the likelihood that his partner will attend at least one ANC visit. These findings are aligned with other studies of women, which have found that women who are more empowered are more likely to seek health care and use antenatal care (24).

Our study compares to Jennings 2014 in several ways (25). Both studies utilize African DHS data sets, measure paternal clinic attendance and empowerment, and controlled for similar variables. Our study differs from the previous studies because it measures the perspective of the partner towards women's empowerment (PVWE), operationalizes empowerment differently, uses data from the men's survey only, and examines different African countries. Jennings 2014 utilized paired data sets using DHS data (25). The authors used the paternal clinic attendance as their key variable while using empowerment indicators from the woman's perspective.

While the association between PVWE and maternal antenatal clinic attendance can be seen from this data, we cannot know from this study how these values affect long term maternal ANC attendance. In the African continent, about 77% of women attend at least one ANC visit, while only about 50% achieve the previously recommended four visit minimum (5).

Identifying the relationship between paternal values and the effect on the number of maternal clinic visits is important. Eight antenatal visits are the ideal number of minimum visits before delivery (3). There are several important programmatic and research implications. If the positive association remains when looking at the number of antenatal visits, it can provide more evidence of the importance of including fathers when formulating strategies to promote maternal-child health.

Second, there is a positive association between paternal ANC attendance and PVWE, which has several potential explanations. While the exact nature of this relationship needs to be examined more closely, it is likely that fathers who have egalitarian values of women understand the importance of providing support at an antenatal clinic visit and share the responsibility of childrearing. This has been demonstrated in other gendered domains within a family (26). It is unknown the directionality of the relationship given the nature of this study. In other words, do fathers' antenatal attendance lead to higher empowerment values or do higher empowerment values lead to antenatal care attendance? More studies examining the directionality and strength of the relationship between values of the status of women and antenatal attendance are needed.

Additionally, there is much more being done throughout many countries in Africa that target the gender norms of men within communities. Overall, in many countries paternal participation in antenatal care is low. 50.8% of

men in our study attended at least one antenatal care appointment with their partner. Men have traditionally been excluded from the reproductive health of women. Recently, there has been a push by governmental and non-governmental agencies to have more men involved in the reproductive health of their partners. One way to do this is though Gender Equality Programming. Non-Governmental Organizations are using gender-training workshops to help engage young men about gender equity (27). Our study provides empiric evidence about the association of paternal ANC attendance and PVWE. Although we cannot determine the directionality of this relationship between paternal ANC attendance and PVWE, future studies may reveal that gender programming work can impact men to be more involved in the reproductive lives of their partners in an equitable way.

This study also provides more evidence related to the importance of considering the partners of women in the context of maternal-newborn health. The body of knowledge pertaining to how men improve maternal-newborn health by attending ANC visits is still developing. Paternal ANC attendance seems to be only one aspect of paternal support for women. It is important to note that in many studies, paternal ANC attendance has been used as a proxy indicator of paternal support of women. It is possible that men who do not attend ANC visits with their partner cannot attend because they support their partner in other ways, such as caring for young children. Assessing a man's view of the reproductive rights of women gives us a glimpse (albeit limited) into an undoubtedly complex masculinity. It is plausible that men who have more equitable values of women (higher PVWE) not only tend to show up for ANC appointments, but also are involved in other aspects of their partner's pregnancy and would highly benefit from targeted antenatal interventions (28-30). More research is needed to understand what other beliefs, values and behaviors men have in addition to participating in ANC and high PVWE.

The key findings in this study reveal several important programmatic and research implications. To our knowledge, this is the first to-date to examination of the relationship between maternal and paternal antenatal care attendance and PVWE in sub-Saharan Africa. It is possible that cultural differences not captured within the DHS survey contributed to the variability of significant findings within each region.

The study has several limitations. Women were not surveyed; the outcome and variables could only be obtained from the DHS men's survey. The study is also limited by the cross-sectional nature of the DHS data. The cross-sectional measure does not capture the dynamic nature of empowerment or the change over time. Ultimately, this may decrease the predictive value of the construct.

The construction of the empowerment index was chosen on a pragmatic basis. The index consisted of four items that focused on gender/social norms of empowerment. Due to missing data and the time intensive process of instrument development, four variables were used. This arguably does not give a complete picture of paternal values of women's empowerment, but it does capture several important aspects of it related to reproductive health. The interviewers administrating the survey were all men, which theoretically reduces the social desirability bias. However, having a DHS representative present to administer the survey versus a paper or electronic survey, most likely results in some level of social desirability bias.

Conclusion

Paternal values of women's empowerment is positively associated with maternal and paternal antenatal care attendance. Men's values of the reproductive rights of their partner may contribute to antenatal care attendance or antenatal care may shape men's values of women. Further research can build upon this study to provide more insight as to how masculinity shapes men's values of the respective rights of women. Partners are a key piece of an immensely complex equation that influences to maternal-newborn health.

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Conflicts of interest

Authors declared no conflicts of interest.

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