Cohabitation in sub-Saharan Africa: does women empowerment matter? Insights from the demographic and health survey

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Abstract

This study examines the relationship between women empowerment indicators and cohabitation in sub-Saharan Africa (SSA). Analyzing information from 124,183 women aged 15 to 49, the research reveals that women with higher levels of acceptance toward violence, greater decision-making capacity, and increased general knowledge level are more likely to cohabit. Conversely, women aged 25 and above, those in rural areas, the wealthiest individuals, and religious individuals were less likely to cohabit. The study underscores the role of women's empowerment in cohabitation dynamics in SSA and highlights the role of addressing adolescent pregnancies in reducing cohabitation among reproductive-age women in the region.

Background

Globally, the study of marriage has become considerably more intricate in modern times due to unparalleled shifts in the timing, duration, and sequence of intimate co-residential relationships (Sassler & Lichter, 2020; Manning, 2020). A notable aspect of the evolving landscape of family structures is the growing prevalence of cohabitation (Odimegwu et al., 2018). Cohabitation, in this context, refers to the living arrangement of unmarried partners who reside together in a manner resembling that of a married couple, with or without children.

Available evidence indicates that the prevalence of cohabitation has increased significantly in most developed countries (Sassler & Lichter, 2020), however, this increasing prevalence has been observed in sub-Saharan Africa (SSA) (Odimegwu et al., 2018; Kamgno & Mengue, 2014). For instance, Odimegwu et al. (2018) report in their study that 11.8% of marital unions are cohabitation with some sub-regional variations where Central Africa reported the highest proportion of cohabitation (21.7%) with West Africa (6.8%) reporting the lowest cohabitation proportions. Similarly, a study conducted in Cameroon (Kamgno & Mengue, 2014) revealed that the incidence of cohabitation increased from 15% to 38.9% between 1991 and 2014.

Although cohabitation contradicts the socio-cultural norms and value system surrounding family formation in SSA, its increasing prevalence in the region has been documented to be facilitated by 'secularization, economic constraints and inability to pay bride wealth' (Odimegwu et al., 2018). Additionally, the existing body of literature on cohabitation in SSA (Odimegwu et al., 2018; Kamgno & Mengue, 2014; Pazvakawambwa et al., 2013) has identified other factors including older age, early sexual debut, having lower educational attainment, being unemployed, and being in the poorest wealth index are known factors that increase the likelihood of being in a cohabiting union. Thus, making cohabitation an important demographic issue of relevance to the wellbeing and welfare of those who contract such unions.

Beyond the established associated factors of cohabitation, there is a growing interest regarding how economic independence, autonomy in decision-making and other components of women's empowerment influence cohabitation unions. This perspective of cohabitation unions is premised on Becker's Economic model – the economic theory (Odimegwu et al., 2018; Di Giulio et al.,2019). According to this theory, when women achieve higher levels of education, their economic prospects and self-sufficiency improve, leading to a decreased reliance on marriage for

financial stability (Odimegwu et al., 2018). As a result, the cost of choosing marriage is raised, as entering into a marital union is likely to come with a trade-off of reduced personal independence (Odimegwu et al., 2018; Anderson & Hansen, 2012). Based on the economic theory, it is hypothesized that women empowerment is associated with higher likelihood of being in a cohabitation union.

Despite the theoretical postulations, a critical gap remains in our understanding of the role of women's empowerment in shaping cohabitation patterns. The existing studies (Odimegwu et al., 2018; Kamgno & Mengue, 2014; Pazvakawambwa et al., 2013) in SSA have mainly focused on assessing the trends and determinants of cohabitation. While empowerment has been acknowledged as a critical determinant of various aspects of women's lives including their utilization of maternal healthcare services (Aboagye et al., 2023), safe sex negotiations (Siedu et al., 2021), and as a protective factor against intimate partner violence (Aboagye et al., 2022), its specific impact on cohabitation dynamics has not been thoroughly explored in this region. This presents a significant knowledge gap that must be filled. We, therefore, examined the association between women empowerment and cohabitation in SSA using data from 13 countries.

Methods

Data source

This study is based on data obtained from the most recent standard demographic and health surveys (DHS) conducted between 2018 and 2021 in thirteen (13) sub-Saharan African countries such as Liberia, Benin, Cameroon, Gambia, Guinea, Kenya, Madagascar, Mali, Nigeria, Rwanda, Sierra Leone, Senegal, and Zambia. The DHS of these countries were included in the study because they offer dependable data on marital relations, including other relevant background characteristics, making it appropriate for this study. The surveys involved samples of women within their reproductive age group (15-49 years), selected using a multi-stage stratified cluster sampling procedure to ensure national representation (Corsi et al., 2012). This involved randomly selecting primary sampling units – mainly clusters – in the first stage and subsequently selecting various households from each of these sampling units in the second stage (Aboagye et al., 2022; Corsi et

al., 2012). The sample for the analysis consisted of 124,183 women between the ages of 15 and 49 having information on the outcome of interest.

Study variables and measurements

Outcome variable

The outcome variable of interest was cohabitation, which was assessed by determining the count of women within the overall group of women who indicated living together. In order to gauge the frequency of cohabitation, the study participants were divided into two groups: those who were cohabiting and those who were not. The designation of 'not cohabiting' encompassed all alternative marital statuses, namely widowed, divorced/separated, and never married. Women who were engaging in cohabitation relationships were coded as "1" and "0" if otherwise.

Explanatory variables

This study primarily focused on women's empowerment, examining it through various measures, aligning with prior research by Yaya et al. [20] and Adde et al. [21], who also considered four empowerment indicators. These indicators encompassed: (1) labour participation, categorising individuals as either "not working=0" or "employed=1"; (2) acceptance toward spousal violence; (3) decision-making capacity; and (4) general knowledge level. Acceptance toward spousal violence was a composite variable derived from five reasons justifying beating a wife, including going out without permission, neglecting children, arguing with the husband/partner, refusing sexual relations, and burning food, measured as yes=1 or no=0. An index was created by summing these responses, resulting in scores from 0 to 5, categorised as "low" (0-1), "medium" (2-3), or "high" (4-5) acceptance of spousal violence. The reliability of this index was checked with a Cronbach's alpha, which shows a value of 0.88, indicating good reliability.

Likewise, general knowledge level was a composite variable derived from factors like education level and media consumption frequency, yielding scores ranging from 0 to 4, categorized as "low" (0), "medium" (1-2), or "high" (3-4) general knowledge level, with a Cronbach's alpha of 0.69, indicating acceptable reliability. Lastly, decision-making capacity assessed authority in healthcare, household earnings, purchases, and family visits, recoded as "yes" (0-1) or "no" (2-4), yielding scores from 0 to 3, categorized as "low" (0), "medium" (1-2), or "high" (3) decision-making capacity, with a Cronbach's alpha of 0.84, indicating good reliability. Other multiple relevant

covariates such as women's age, educational level, type of residence, religion, wealth index, age at first birth, partner's age and level of education were identified and accounted for based on previous empirical literature (Odimegwu et al., 2018).

Data analysis

We conducted a descriptive analysis of the background characteristics of the respondents by cohabitation status. A bar graph was utilized to visually represent the prevalence of cohabitation across the selected countries. A chi-square test was performed to determine statistically significant associations between the outcomes and explanatory variables. Furthermore, multivariate analyses were used separately to examine the association between women empowerment indicators and cohabitation. Additionally, relevant factors were identified and accounted for in the final model. The models were used to calculate unadjusted and adjusted odds ratios with 95% confidence intervals. Owing to the complex sampling design of the surveys, all analyses were adjusted for clustering at the primary sampling unit level, stratification, and sample weight effects. Before performing the multivariate logistic regression, the possibility of multicollinearity was examined using the variance inflation factor (VIF), which showed a mean score of 5.59, indicating no significant multicollinearity. All analyses were performed using the Stata version 14.

Results

Descriptive results

Table 1 displays the composition of the women under study, both in terms of weighted and unweighted samples. The table also includes the survey years, spanning from 2017/2018 to 2021. Among the total sample of 124,183 women, 13,492 were found to be engaged in cohabitation relationships.

Table 1: Distribution of cohabitation among women in 13 SSA countries

Countries	Survey year	Weighted	Unweighted	Sample of cohabited	
		(N)	(N)	women (n)	
Liberia	2019-2020	3,828	4,166	1,938	
Benin	2017-2018	10,111	10,016	2,127	
Cameroon	2018	7,076	6,706	1,562	

All countries		124,183		13,492	
Zambia	2018-2019	7,180	7,039	62	
Senegal	2019	4,645	4,931	6	
Sierra Leone	2019	9,001	9,064	493	
Rwanda	2019-2020	7,120	6,947	2,524	
Nigeria	2018	26,939	26,612	860	
Mali	2018	7,701	7,341	48	
Madagascar	2021	10,656	10,472	1,617	
Kenya	2022	16,867	17,266	2,093	
Guinea	2018	6,977	7,017	144	
Gambia	2019-2020	6,080	6,606	18	

Figure 1 represents the prevalence of cohabitation among women in the thirteen (13) countries included in the study. Overall, 10.9% of the women included in the study were found to be in cohabiting relationships. The prevalence of cohabitation ranges from 50.6% in Liberia to 0.1% in Senegal. Equally, more than one-third (35.4%) of the sampled women in Rwanda were engaged in cohabitation relationships. Similarly, about one-fifth of women in Benin and Cameroon were respectively involved in cohabitation relationships.

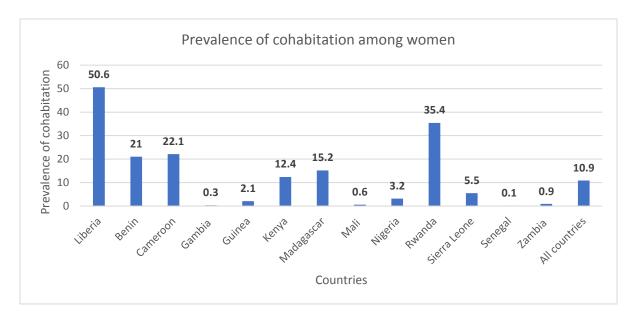


Figure 1: A bar graph showing the prevalence of cohabitation among women by countries

Proportional distribution of women involved in cohabitation relationships by women empowerment indicators and other background characteristics

Table 2 displays the results of the analysis, indicating the proportion of women involved in cohabitation relationships based on various background characteristics. This includes the chi-square test score along with corresponding p-values, indicating the presence of statistically significant connections between the explanatory variables and the outcome (cohabitation). Apart from the type of place of residence, all chosen explanatory variables exhibited statistically significant associations with the outcome. The analysis revealed that 11.7% of women who were employed were involved in cohabitation relationships compared to 8.8% among women who were not employed. Regarding the perspective on violence, 11.6% of women who held a less accepting attitude towards violence were found to be engaged in cohabitation, whereas this percentage was 8.2% for those with a more accepting attitude. In terms of decision-making capability, 14.4% of the respondents involved themselves in cohabitation relationships, which was notably higher compared to those with limited decision-making capacity (5.5%). A similar pattern emerged when considering the level of knowledge.

Regarding the covariates, the proportions of cohabiting individuals significantly varied across different age groups. The highest proportion was observed among women aged 15-19 (14.9%), while the lowest proportion was among those aged 25 and above. Notably, cohabitation was less common among Muslim women, with the highest proportion found among women with no religious affiliation (2.5%). The distribution of women in cohabitation relationships was relatively even across different wealth indices.

Table 2: Cohabitation by background characteristics

Explanatory Variables	Proportion of cohabited				
	women				
	(n) (%) (X ²) P-valu				
Women empowerment indicators					
Labour force participation			361.1484	< 0.001	
Not employed	3,283	8.80			

Employed	10,209	11.75		
Acceptance toward spousal			226.8095	< 0.001
violence				
Low	9,416	11.61		
Medium	2,236	10.80		
High	1,840	8.23		
Decision-making capacity			1.7e+03	< 0.001
Low	1,856	5.50		
Medium	3,705	10.55		
High	7,931	14.34		
General knowledge level			462.1416	< 0.001
Low	1,650	7.01		
Medium	7,329	11.85		
High	4,513	11.63		
Covariates				
Women's age			4333.6182	< 0.001
15-19	744	14.86		
20-24	2,557	13.96		
25 and above	10,191	10.10		
Type of residence			1.9781	0.160
Urban	5,205	11.42		
Rural	8,287	10.54		
Religion			7.5e+03	< 0.001
No religion ^a	918	25.01		
Christians	10,716	16.88		
Islam	1,360	2.49		
Other religion	498	20.13		
Wealth status			122.6637	< 0.001
Poorest	2,515	10.05		
Poorer	2,644	10.52		
Middle	2,789	11.30		

Richer	3,088	12.45		
Richest	2,456	10.01		
Age at first birth			60.0323	< 0.001
Below 20 years	7,303	10.58		
20-24	4,740	11.84		
25 and above	1,450	9.56		
Partners' age			856.5200	< 0.001
15-19	77	24.18		
20-24	936	23.46		
25 and above	12,479	10.41		
Partners' educational level			2.0e+03	< 0.001
No education	2,844	6.35		
Primary	4,694	15.31		
Secondary	4,746	13.55		
Higher	1,207	8.80		

No religion^a (Nigeria and Zambia do not have information on this category in the dataset)

#Note: estimates are weighted

Association between women empowerment and cohabitation

The outcomes of the logistic regression analysis investigating the link between indicators of women's empowerment and the outcome of cohabitation are presented in Table 3. At this analytical level, two models were employed: Model 1 assesses the connection between women's empowerment and the outcome, while Model II adjusted for additional relevant factors to evaluate this connection. The odds ratios (OR) and their corresponding 95% confidence intervals (CI) were calculated to assess the impact of different variables. In the final model, the analysis shows that women who held medium [aOR = 1.12, CI = 1.05, 1.18] and high levels of acceptance toward spousal violence [aOR = 1.20, CI = 1.12, 1.28], those with medium [aOR = 1.22, CI = 1.14, 1.31] and high [aOR = 1.10, CI = 1.04, 1.18] decision-making capacity, and those with medium [aOR = 1.36, CI = 1.27, 1.46] and high [aOR = 1.32, CI = 1.21, 1.43] levels of general knowledge had

higher odds of cohabiting compared to their counterparts with a less acceptance toward spousal violence, limited decision-making capacity, and low levels of general knowledge.

Turning to the variables that were controlled for, higher age was associated with decreased odds of cohabitation. Consequently, when compared to women aged 15-19, those aged 20-24 and 25 years and older were 24% and 56% less likely, respectively, to be involved in cohabitation relationships. The analysis also demonstrated that women living in rural areas had lower odds of cohabitation [aOR = 0.77, CI = 0.73, 0.81] compared to women residing in urban settings. Furthermore, the findings indicated that women who were religiously affiliated were less likely to engage in cohabitation relationships compared to those with no religious affiliation. We found that women from households with the highest wealth index [aOR = 0.67, CI = 0.61, 0.74] had a reduced likelihood of engaging in cohabitation relationships compared to their counterparts from households with the lowest wealth index. Conversely, compared to women who gave birth before the age of 20, those who gave birth between the ages of 20-24 and 25 years and above faced a lower risk of engaging in cohabitation relationships. The findings also highlighted a significant positive link between the educational level of partners and the outcome. Hence, women whose partners had primary and secondary education had higher odds of cohabitation compared to those whose partners had no formal education. Additionally, the findings pointed out disparities in cohabitation across different countries. In comparison to Liberia, women from all the countries studied were less likely to be involved in cohabitation relationships.

Table 3: Association between women empowerment and cohabitation

Variables	Model 1		Model II	
	OR	95%CI	aOR	95%CI
Women empowerment in	dicators			
Labour forced participati	ion			
Not employed	Ref	Ref	Ref	Ref
Employed	1.29***	[1.24,1.35]	1.01	[0.96, 1.06]
Acceptance toward spous	al			
violence				

Low	Ref	Ref	Ref	Ref
Medium	1.02	[0.97,1.07]	1.12***	[1.05,1.18]
High	0.79***	[0.75,0.83]	1.20***	[1.12,1.28]
Decision-making capacity				
Low	Ref	Ref	Ref	Ref
Medium	2.11***	[1.99,2.24]	1.22***	[1.14,1.31]
High	2.74***	[2.59,2.89]	1.10***	[1.04,1.18]
General knowledge level				
Low	Ref	Ref	Ref	Ref
Medium	1.56***	[1.47,1.64]	1.36***	[1.27,1.46]
High	1.29***	[1.21,1.37]	1.32***	[1.21,1.43]
Covariates				
Women's age				
15-19			Ref	Ref
20-24			0.76***	[0.68,0.83]
25 and above			0.44***	[0.40,0.48]
Type of residence				
Urban			Ref	Ref
Rural			0.77***	[0.73,0.81]
Religion				
No religion ^a			Ref	Ref
Christians			0.54***	[0.49,0.60]
Islam			0.14***	[0.13,0.16]
Other religion			0.62***	[0.54,0.74]
Wealth index				
Poorest			Ref	Ref
Poorer			1.04	[0.98,1.11]
Middle			1.03	[0.96,1.10]
Richer			0.98	[0.91,1.06]
Richest			0.67***	[0.61,0.74]
Age at first birth				

Below 20 years			Ref	Ref
20-24			0.91***	[0.87,0.96]
25 and above			0.74***	[0.68, 0.80]
Partners' educational level				
No education			Ref	Ref
Primary			1.09**	[1.03,1.16]
Secondary			1.36***	[1.27,1.46]
Higher			1.06	[0.96,1.16]
Country variable				
Liberia			Ref	Ref
Benin			0.32***	[0.29,0.35]
Cameroon			0.37***	[0.34,0.41]
Gambia			0.00***	[0.00, 0.01]
Guinea			0.05***	[0.04, 0.06]
Kenya			0.10***	[0.09,0.11]
Madagascar			0.13***	[0.12,0.15]
Mali			0.02***	[0.01, 0.02]
Nigeria			0.05***	[0.05, 0.06]
Rwanda			0.55***	[0.50, 0.60]
Sierra Leone			0.12***	[0.11,0.14]
Senegal			0.00***	[0.00, 0.01]
Zambia			0.00***	[0.00, 0.01]
Model fitness				
Constant	0.04***	[0.04, 0.05]	3.19***	[2.72,3.74]
Prob > chi2	< 0.001		< 0.001	
Pseudo R ²	0.0263		0.2465	
AIC	81474.19		63110.68	

Ref: reference category; AIC: Akaike Information Criterion; OR: odds ratio; aOR: adjusted odds ratio; ***p<0.001, **p<0.010, *p<0.050

Discussion

The present sought to examine the association between women empowerment and cohabitation in SSA. Our findings revealed that 10.9% of women of reproductive age were in cohabitation unions. The observed proportion of cohabitation is similar to what has been reported in a study by Odimegwu et al. (2018). However, the observed proportion of cohabitation among women is lower than when compared to other jurisdictions including China (46.4%) (Yu & Xie, 2015), Mexico (13.1%) (Caudillo & Lee, 2023), and the UK (23.4%) (Office for National Statistics, 2023). The low prevalence of cohabitation in SSA could be explained by the societal non-acceptance of this type of union. Cohabitation in SSA is often considered an unconventional partnership that deviates from the acceptable traditional, religious and cultural norms relating to the formation of marital and/or sexual unions (Odimegwu et al., 2018; Obeng-Hinneh, & Kpoor, 2022). This normative system exacerbates social stigma of cohabitation which discourages women from cohabiting.

Results from our analyses support the hypothesis that women empowerment is significantly associated with cohabitation. With the exception of labour participation which was not significant in the adjusted model, higher scores in the remaining three indicators of women empowerment (i.e., acceptance toward spousal violence, decision-making capacity, and general knowledge level) were associated with higher odds of cohabitation. The findings suggest that individuals with high attitudes towards violence are more likely to choose cohabitation as a form of partnership. While there are no clear studies that have investigated this association, our findings corroborate Wong et al.'s (2016) study that posits that intimate partner violence is more pervasive in cohabitation unions compared to those who are married. We postulate that women with high attitudes towards violence might have limited conflict resolution skills; as such, cohabitation may be perceived as a more flexible and transient arrangement, allowing them to avoid the commitment and challenges of a formal marriage where conflict resolution and compromise might be more critical. More studies are required to fully comprehend the intricate association between attitudes to violence and women's involvement in cohabitation unions.

As indicated, our study suggests that women who had high decision-making capacity and general knowledge levels were more likely to enter into a cohabiting union. Marriage, particularly in SSA, is a family formation structure that is significantly shaped by acceptable sociocultural norms and expectations (Popoola & Ayandele, 2019; Baataar & Amadu, 2014). It means that it is these

sociocultural norms that pressure or influence women to get married. However, being empowered to make decisions for oneself, including in matters relating to marriage makes women more assertive to go against long-held social viewpoints about marriage, thereby increasing their likelihood to cohabit. Also, as postulated by the economic theory, the empowerment of women fosters improved economic prospects and self-sufficiency, leading to a decreased reliance on marriage for financial stability (Ahonsi et al., 2019; Odimegwu et al., 2018). This situation is likely to make women who are empowered in decision-making and in terms of their knowledge consider the cost of marriage as high since it has the tendency to be associated with a trade-off of reduced personal independence (Odimegwu et al., 2018; Andersen & Hansen, 2012). Thus, explaining the high odds of cohabitation among empowered women.

The study also found significant associations between some covariates and cohabitation. Notably, women aged 25 years and above were less likely to enter into cohabitation – a result that is inconsistent with Odimegwu et al.'s study (2018) which found higher odds among this age group when compared to those in lower age groups. Perhaps the lower odds of cohabitation among older women of reproductive age compared to those <20 years could be due to adolescent pregnancy. In most countries in SSA, when adolescent girls get pregnant, they are often forced to move in to cohabit with the male responsible for the pregnancy (Ahonsi et al., 2019; Manning & Cohen, 2015). One study (Muthengi et al., 2022) supports this explanation by indicating that the likelihood of cohabitation increased by 61% among adolescents when they were compelled to enter a union due to pregnancy. It is, therefore, not surprising that our study found an inverse association between age at first birth and the likelihood of cohabiting. Having a child at an early age, in SSA, is often considered a deviation from societal values; this may come with some level of stigmatization, shame and ridicule from members of the community (Yakubu & Salisu, 2018; Ahinkorah et al., 2022). It is possible that those who give birth at an early age would enter into cohabitation in a bid to somewhat legitimize their pregnancy.

Consistent with previous studies (Odimegwu et al., 2018; Village et al., 2010; Ojewola & Akinduyo, 2017), we found that women with religious affiliation were less likely to engage in cohabitation compared to those who were not religiously affiliated. A possible explanation is that religious teachings often emphasize marriage as a sacred institution. Hence, religious women may hold stronger beliefs in the sanctity of marriage and may view cohabitation as contrary to their

religious teachings. This could lead them to choose marriage over cohabitation. Conversely, less religious women may be more open to secularization which is one of the main contributors to the acceptance of cohabitation unions (Odimegwu et al., 2018; Esteve et al., 2016).

Our study shows that women in rural areas were less likely to cohabit than those in urban areas. Similar findings have been reported in Zambia (Muthengi et al., 2022). Rural areas often tend to have more conservative and traditional values compared to urban areas. Such strong conservative views and traditional values might discourage cohabitation among women, and rather promote traditional marriage. In line with a prior study conducted in SSA (Odimegwu et al., 2018), we found that the odds of cohabitation were significantly low among those in the richest wealth index compared to those in the poorest wealth index. A possible explanation is that people from households with the poorest wealth index may be more likely to cohabit because they cannot afford to get married due to the high cost of the bride price or bride wealth (Odimegwu et al., 2018; Cohn, 2011). Women who had a partner who had primary or secondary education were more likely to cohabit. The reasons behind this association remain unclear, and further research is needed to enhance our understanding of the link between a partner's level of education and the likelihood of cohabitation

Strengths and limitations of the study

One of the limitations of this study is the use of a dataset that employs a cross-sectional design. This does not permit us to establish causality between women empowerment and cohabitation. Also, our study does not differentiate between premarital cohabitation and cohabitation after divorce, widowhood or separation. Other cultural values and norms, which may have influenced the outcomes, were not considered due to data limitations. Nevertheless, the sample for this study is large enough to support the extrapolation of the findings to women of reproductive age in SSA. We also employed appropriate analytical tools which ensures the rigor and reliability of the findings.

Conclusion

The present study contributes significantly to the existing scholarly literature on cohabitation in SSA. The theoretical orientation of this research is premised on Becker's Economic model of marriage formation. Based on the findings from the study, we conclude that women empowerment

contributes significantly to the acceptance and practice of cohabitation in SSA. The study further concludes that addressing adolescent pregnancies would have a significant impact on reducing the practice of cohabitation among women of reproductive age in SSA. We recommend that research directions should include longitudinal studies to understand the evolving relationship between empowerment and relationship choices, qualitative inquiries to reveal underlying motivations, and comparative analyses across diverse cultural contexts to expand insights into the interplay between empowerment and cohabitation decisions.

Abbreviations

aOR: Adjusted Odds Ratios

AIC: Akaike Information Criterion

DHS: Demographic and Health Surveys

SSA: Sub-Saharan African

VIF: variance inflation factor

Declarations

Acknowledgement

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Authors' Contribution

CA and JO conceptualized the study. CA designed and performed the analysis. JO contributed to the analytical design. CA and JO drafted the first manuscript. JO, KSD, NA, and CA revised the manuscript for intellectual content. All authors read and approved the final manuscript.

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Availability of data and materials

The dataset(s) supporting the conclusions of this article is(are) available in the DHS repository at: http://dhsprogram.com/data/available-datasets.cfm

Ethics approval and consent to participate

Ethics approval was not required for this study since the data is secondary and is available in the public domain. More details regarding DHS data and ethical standards are available at: http://goo.gl/ny8T6X.

Consent for publication

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

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