Original Article

Levels and determinants of nonmarital fertility in Kenya

Lawrence Ikamari [1*]

[1] Population Studies and Research Institute, University of Nairobi, P.O. Box 30197 00100 GPO, Nairobi, Kenya

[*] Correspondence: likamari@uonbi.ac.ke Tel.: (+254733860323)

Abstract: **Background:** This study sought to identify factors associated with nonmarital fertility in Kenya. **Method:** The study utilized a nationally representative sample of 12,777 never-married women aged 15-49 years sourced from the 2022 Kenya Demographic and Health Survey. Descriptive statistics and logistic regression analysis were employed to analyze the data. **Results:** The study revealed a nonmarital fertility prevalence of 35.7 percent. The occurrence of nonmarital fertility exhibited statistically significant association with various factors. Woman's current age shows a strong association with nonmarital fertility, with higher odds observed with increasing age. Cohabitation status plays a significant role, with cohabiting women having a much higher likelihood of nonmarital fertility. Educational attainment inversely affects nonmarital fertility, with higher education associated with lower odds. Household wealth status is also inversely associated with nonmarital fertility. Employment status indicates that working women have higher odds of nonmarital fertility, with household and domestic work showing particularly high odds. Religion has a significant effect with Islam associated with lower odds. The place and region of residence also influence nonmarital fertility, with rural areas having higher odds, and all regions showing lower odds compared to Nairobi. **Conclusion**: Nonmarital fertility is relatively high and significantly varies with the woman's socio-demographic characteristics. The study recommends interventions to reduce nonmarital fertility and for further research to explain occupational and regional disparities in nonmarital fertility risks in the country.

Keywords: Nonmarital fertility, prevalence, variation, correlates, Kenya

1. Introduction

Nonmarital fertility refers to childbearing outside marriage. This means that the parents of the child are not legally or customarily married at the time of the child's birth. Nonmarital childbearing can happen to couples who are in a committed relationship but have not yet formalized their union, as well as to couples who are not in a committed relationship. In many parts of the world, marriage is considered a very important social institution that provides the foundation for the formation of families and childbearing *inter alia*. As such, in most societies childbearing is largely confined to married women [1],

However, recent research indicates that the institution of marriage is undergoing a significant transformation in its influence on fertility patterns, primarily due to the escalating number of births taking place outside of wedlock [1-9]. This shift can be attributed to various factors, including early sexual debut, a rising age at first marriage, a diminishing proportion of the population that is married, an increased prevalence of contraceptive usage, and the growing access to education and empowerment for girls and women [2,10-12].

In Sub-Saharan Africa, there is a growing trend among women to postpone marriage until later in life [12-15]. This shift is particularly remarkable considering the prevalent practice of premarital sex in the region, as indicated in the literature [16-18]. Consequently, with the increase in the age at which women first marry, many African women now face an extended period of vulnerability to nonmarital childbearing during their later adolescence and early adulthood. This

change in marriage patterns is linked to a significant rise in rates of nonmarital childbearing within specific contexts in sub-Saharan Africa, as highlighted in the literature [8, 14, 19-24].

The escalating prevalence of nonmarital fertility in Sub-Saharan Africa has triggered concerns about potential adverse consequences linked with such occurrences. Nonmarital childbearing is known to have negative effects at both the aggregate and individual levels [20]. On an individual basis, women who experience nonmarital childbearing are exposed to a range of health risks, including heightened vulnerability to sexually transmitted infections [20], and unintended pregnancies, which is associated with increased likelihood of resorting to unsafe abortions [25].

Furthermore, the implications of nonmarital fertility extend to the household level, often leading to female-headed households and consequently contributing to poverty [19]. This trend also has repercussions on marriage prospects, influencing the likelihood of entering into marriage, as observed in several studies [26-30]. Moreover, it can affect the stability of subsequent marriages [31].

Nonmarital childbearing also adversely affects the health and developmental trajectory of the resulting child [32, 33]. The childhood consequences of being born out of wedlock are especially severe in sub-Saharan Africa: compared to their peers born to formally married parents, these children are often born in the absence of medical supervision, are often malnourished and not immunized [34, 35], and some of the children may be abandoned by their mothers, and such children are often exposed to elevated under five mortality risks [11, 14 36].

Despite the significant importance of comprehending the prevalence and underlying factors influencing nonmarital fertility, it is evident that there is an absence of comprehensive nationwide studies on this subject within Kenya's recent history. As a result, the current status of nonmarital fertility levels, along with the variations, as well as the factors associated with nonmarital fertility, remains inadequately understood. This study aims to address this gap and enhance the literature on nonmarital fertility by investigating the prevalence and disparities in nonmarital fertility. Additionally, it seeks to explore and document the socioeconomic and demographic determinants associated with nonmarital fertility in Kenya. To accomplish this, the study employs the most recent and nationally representative survey data and uses the second demographic transition theory to underpin the study.

1.1 The Second Demographic Transition Framework

As earlier indicated, the Second Demographic Transition (SDT) framework, which is an offshoot of the classic demographic transition theory, is used to guide this study. The SDT was originally developed [42-42] to describe changes in family and fertility patterns observed in developed countries, especially Europe, since the mid-20th century. This framework builds upon the classic demographic transition, which involved the shift from high to low birth and death rates as societies industrialized and modernized. The SDT highlights a further transformation characterized by demographic changes driven by shifts in values from materialism to post-materialism, emphasizing individual autonomy, self-realization, and gender equality. Key indicators include increased delayed marriage and childbearing, cohabitation, greater acceptance of diverse family structures, increased female labour force participation, higher divorce rates, and more children born outside of marriage.

The SDT offers a good theoretical underpinning for this study. Although many of the elements and tenets of the SDT are not fully observable in Kenya, evidence shows that demographic trends characteristic of the SDT, have started showing up in the country. In Kenya, many individuals are postponing marriage to pursue higher education and career opportunities. As more women attain higher education and enter the workforce, their economic independence grows, diminishing the necessity of marriage for financial security. This shift empowers women to make reproductive choices outside the confines of marriage, increasing the likelihood of non-marital childbearing. Education also correlates

with delayed marriage and childbearing, as individuals prioritize their careers and personal development. This delay often leads to childbearing outside of marriage, as the timing of childbirth becomes less tied to marital status [43,44].

The SDT framework highlights shifts in cultural and social norms that support increased non-marital childbearing. In Kenya, increased education, urbanization, and exposure to diverse cultural influences have contributed to changing attitudes toward family formation and childbearing outside of marriage. There is evidence of growing acceptance of diverse family forms, including single parenthood and cohabitation [45,46]. This trend aligns with the SDT's emphasis on the rise of single parenthood and cohabitation as alternatives to marriage [47]. In this study, we expect education and cohabitation to be closely associated with non-marital childbearing in the country.

Rapid urbanization in Kenya has created economic pressures that make traditional marriage less desirable for some individuals. As people migrate to cities in search of better opportunities, they are exposed to diverse lifestyles and influences that reduce the impact of traditional norms, leading them to form families outside the conventional marital framework [46, 48]. Thus, we expect urban residence to be associated with increased odds of experiencing non-marital fertility in Kenya.

The SDT framework points to shifting gender norms and increased individualism. In Kenya, women are gaining more autonomy due to education and employment. Exposure to modernizing influences through global media and communication technologies fosters the adoption of individualistic values, influencing their reproductive decisions and are increasingly prioritizing personal goals over traditional family expectations, which can result in higher rates of non-marital childbearing [36, 48-50].

Furthermore, there has been a substantial increase in access and uptake of reproductive health services and contraceptives in the country [37]. The improved access to reproductive health services and contraception allows Kenyan women to better control their fertility, contributing to the decoupling of marriage and childbearing [51]. Thus, in this study, we expect educated and working women to have higher odds of non-marital fertility than their uneducated and nonworking counterparts. In summary, these trends reflect broader societal transformations consistent with the SDT framework, including greater individualism, changing gender roles, and the decoupling of marriage and fertility.

2. Materials and Methods

2.1 Source of data

The data for this study were drawn from the 2022 Kenya Demographic and Health Survey (KDHS). This is a nationally representative survey designed to provide reliable data for the monitoring of demographic and health indicators in the country. The survey collected data on fertility, marriage, sexual activity, fertility preferences, family planning, maternal and child health, information about HIV/AIDS and other sexually transmitted diseases, information on malaria, and use of mosquito nets and domestic violence. The survey interviewed 32,156 women of reproductive age [15-49 years] and 14,453 men in the 15-54 age bracket. The survey was conducted as part of the DHS program. The details of the sampling methodology, as well as an assessment of the quality of the data, are presented and discussed extensively in the survey report [37].

The central focus of analysis pertains to individual women within the reproductive age bracket of 15-49 who were never married and those who reported that they are cohabiting at the time of the survey (N = 12, 777). Consequently, instances of childbearing among these women were classified as nonmarital, as these women lacked a legal or customary marital status during the periods of pregnancy and childbirth. This study focuses on women who reported that they have never been married in their life [N = 10,439] and those who were cohabiting but never considered themselves as married [N = 2,339]. These are weighted cases. Thus, the study excludes women who were previously married but divorced or

widowed because of lack data on when they divorced or widowed and whether they had children since then. Obviously, their exclusion may under estimate the level of non-marital childbearing in the country.

2.2 Study variables

2.2.1 Dependent variable

This study's focus revolves around the dependent variable of nonmarital fertility, specifically pertaining to women aged 15-49 who have never been married. The measurement of this variable follows a binary framework. It is derived from the count of children ever born to women who reported never being married during the survey. Within this context, never-married women who had given birth to at least one child are categorized as having experienced nonmarital fertility and are designated with a value of 1. Conversely, those never-married women who had not borne any children are categorized as lacking nonmarital fertility and are assigned a value of 0. Furthermore, for the sake of clarity and precision, the terms childbearing and childbirth are intentionally used interchangeably in this study to specifically refer to the concept of fertility.

2.2.2 Independent variables and measurement

The independent variables included in this study have been selected based on the important literature on nonmarital fertility in developing countries, especially in Sub-Saharan Africa. The independent variables included are: woman's current age [< 20, 20-29, 30-39, 40-49], cohabitation status [Never cohabiting, cohabiting], level of education [no education, primary, secondary, higher], household wealth status [poor, middle, rich]; current work [not working, working], occupation [No work/occupation, professional/managerial, Service/sales/clerical, Agricultural work, household and domestic work, manual work] type of place of residence [rural, urban], religion [Catholic, Protestant, Islam, Others], region of residence [Nairobi, Central, Coast, Eastern, Rift Valley, Nyanza, Western and North-Eastern].

2.3 Methods of data analysis

Analysis of data entailed the use of percentages, cross-tabulation, and logistic regression. Frequencies are used to describe the characteristics of the study population. Bivariate analysis includes the estimation of the prevalence and differentials in nonmarital fertility. The calculations include percentage distributions of never married women aged 15-49 years according to whether they had nonmarital birth by selected explanatory variables. The signification of association was determined that 95% confidence level that is *p* value of equal of less than 0.05.

Since the dependent variable is binary [nonmarital fertility or no non marital fertility]. In this case, logistic regression analysis is the most appropriate analytical tool to use to establish the effects of the independent variables [52]. Since the logit coefficients do not have an intuitive interpretation because they represent effects of the log of the odds, the log of odds is converted to odds ratios [OR] by exponentiation. Only the odds ratios with 95% confidential intervals are presented for the logistic regression analysis in this study.

The results are presented as odd ratios [OR], which represent the relative likelihood of a woman with the specific characteristic of having a nonmarital birth in comparison to a woman who would be in the appropriate reference group. The OR of the reference group or category is one (1.00). If the OR of a given category is greater than 1.00, this indicates greater likelihood of having a nonmarital birth, and when the OR is less than 1.00, it indicates a lower likelihood of having a nonmarital birth compared to the reference group. In this analysis, a variable is reported as having a significant effect, if its effect on nonmarital childbearing is statistically significant at least at the 5 per cent level of significance. Univariate logistic regression is used to investigate the unadjusted effect of the independent variables on nonmarital childbearing, represented by the odds ratios [OR]. Multivariate logistic regression analysis is used to establish the net effect [aOR] of each of the variables on nonmarital fertility.

2.4 Ethical considerations

Ethical permissions were not required for this study because the 2022 KDHS, as part of the Worldwide DHS program, is already publicly available and used. Institutions that commissioned, funded, or managed the KDHS were responsible for ensuring ethical considerations and procedures during data collection. The DHS Program, ICF International, Kenya National Bureau of Statistics (KNBS), Ministry of Health (MOH) and partners, approved the survey in line with the U.S. Department of Health and Human Services regulations for the protection of human subjects. The data set for this study can be accessed on https://dhsprogram.com/data/available-datasets.cfm.

3. Results

3.1 Profile of the study population

Table 1 provides an overview of the socio-demographic characteristics of the study participants. The study included a total of 12,777 women aged 15 to 49. The average age observed was 22.69 years with a 95% confidence interval ranging from 22.69 to 22.82. The standard error for this measurement was 0.066, and the median age was determined to be 20 years. Notably, a significant majority (84%, n=10,684) of the women fell within the 15-24 age bracket, while approximately 5 percent were situated within the 40-49 age range.
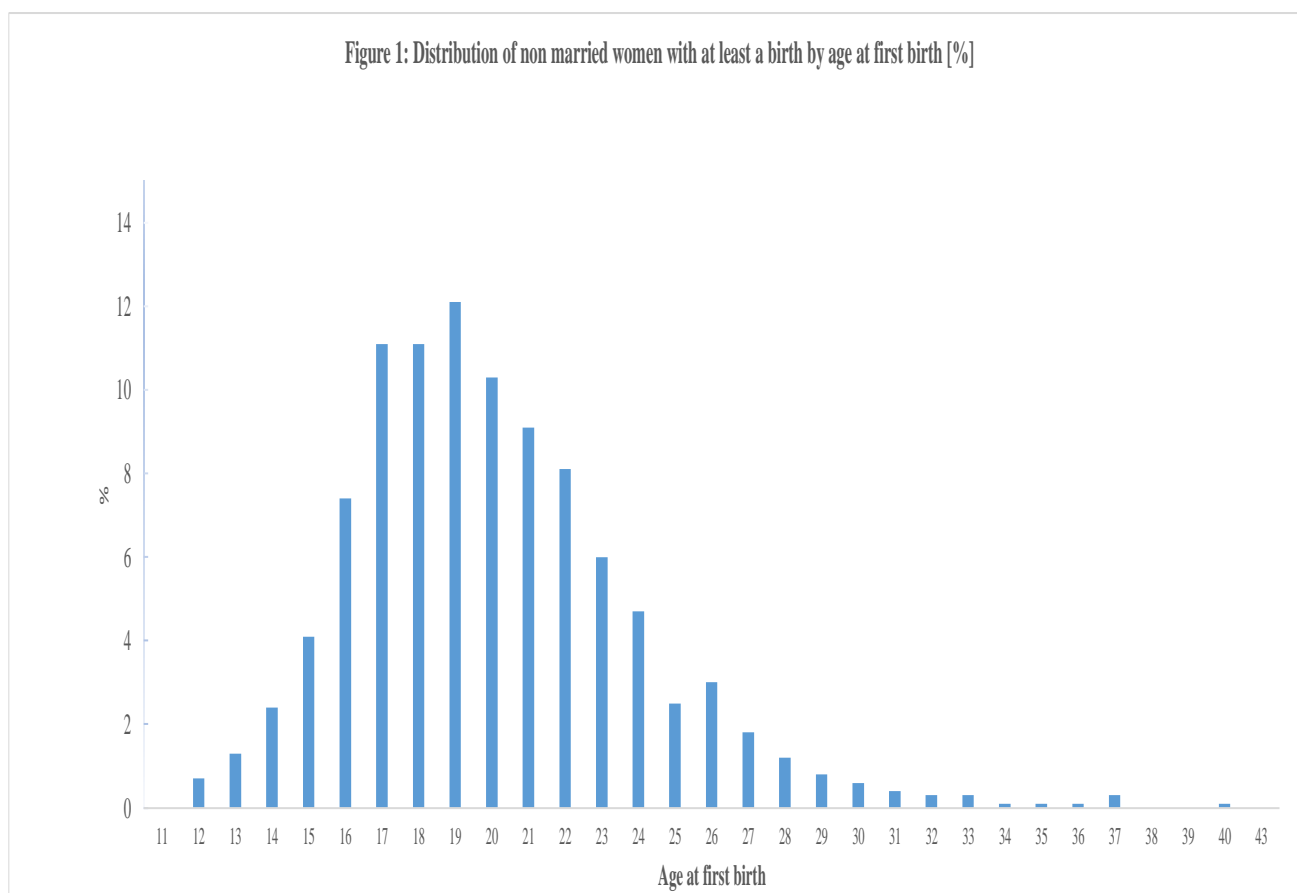
About 35.7% (n=4559, 95% CI: 34.85 – 36.51, standard error = 0.479) of the women in the study had experienced a non-marital birth. Within this group of 4559 women, the average age at the time of their first nonmarital birth was 20 years (95% CI = 19.93 - 20.15), and the median age at first birth was 19 years. This implies that half of the women had their initial nonmarital child by age 19. By the age of 24, 85.5% (n=4036) of the women had already given birth to their first child outside of marriage [**refer to Figure 1 for more details**]. Among these 4559 women, the average number of children ever born was 2.04, with 52% (n = 2378) of them having only one child and the remaining 48% (n=2181) having at least two children each.

The majority of women in the sample (78%) reported that they had never cohabited, while 18 percent reported currently cohabiting with a partner at the time of the survey. In terms of education, 51 percent of the participants (n = 6517) had completed secondary education, followed by 25.7 percent (n=3279) with primary education. A smaller proportion, 22 percent, had attained higher education.

Geographically, a significant portion of the women resided in rural areas (56.6%, n=7227), and 26 percent (n=3365) were located in the expansive Rift Valley region. When it came to socioeconomic status, 50 percent of the women (n = 6425) belonged to affluent households, while religious distribution showed that 61 percent (n = 7822) identified as Protestants.

Table 1: Sociodemographic characteristics of the sample, Kenya, 2022 KDHS

Characteristic	Number [weighted cases]	Percentage (%)	95% CI of the percentage
Current age			
15-19	5618	44	43-11 – 44.84
20-29	5066	39.7	38.80 – 40.50
30-39	1490	11.7	11.11 – 12.22
40-49	602	4.7	4.34 – 5.08
Nonmarital fertility/birth			
Yes	4559	35.7	34.49 – 36.51
No	8218	64.3	63.49 – 65.51
Cohabiting Status			
Not Cohabiting	10,438	81.7	81.02 – 82.36
Cohabiting	2,339	18.3	17.64 – 18.98
Education			
None	212	1.7	1.44 – 1.88
Primary	3279	25.7	24.91 – 26.42
Secondary	6517	51.0	50.14 – 51.87
Higher	2769	21.7	20.96 – 22.36
Household wealth status			
Poor	3948	30.9	30.10 - 31.70
Middle	2403	18.8	18.13 – 19.48
Rich	6425	50.3	49.42 – 51.16
Current work Status			
Working	4718	36.9	36.09 – 37.76
Not working	8059	63.1	62.24 – 63.91
Occupation			
Not working	7111	55.7	54.80 – 56.52
Professional/Managerial	1272	10.0	9.44 - 10.47
Service/sales/clerical	1393	10.9	10.30 – 10.44
Agricultural work	1209	9.5	8.96 – 9.97
Household and Domestic	909	7.1	6.67 – 7.56
Manual	883	6.9	6.47 – 7.35
Religion			
Catholic	2574	20.1	19.45 – 20.84
Protestant	7822	61.2	60.38 – 62.07
Muslim	792	6.2	5.78 – 6.62
Others	1588	12.4	11.86 – 13.00
Type of place of residence			
Urban	5550	43.5	42.58 – 44.29
Rural	7227	56.5	55.71 – 57.42
Region of residence			
Nairobi	1897	14.8	14.58 – 15.46
Central	1827	14.3	13.69 - 14.91
Coast	1055	8.3	7.78 - 8.74
Eastern	1614	12.6	12.06 – 13.21
Nyanza	1409	11.0	10.48 – 11.56
Rift Valley	3365	26.3	25.57 – 27.10

Figure 1: Distribution of non married women with at least a birth by age at first birth [%]

3.2 Bivariate results

Table 2 shows the prevalence of premarital childbearing among the respondents and according to the independent variables. The results depict statistically significant differentials in the prevalence of premarital childbearing among all independent / explanatory study variables. The level of nonmarital fertility shows a significant rise as a woman's age increases, ranging from 7.9 percent among women aged 15-19 years to a notable 93.1 percent among women in the 40-49 age group. Women who indicated cohabitation with a partner exhibit a notably elevated nonmarital fertility rate of 90.2 percent, in comparison to women who were not in a cohabiting arrangement.

The highest level of nonmarital fertility was observed among women with no education, reaching 51 percent, closely followed by those with primary education at 46 percent. Women with secondary and higher education displayed comparatively lower rates of nonmarital fertility when compared to those with either no education or primary education. Notably, women with higher education exhibited a slightly higher nonmarital fertility rate of 35.5 percent, as opposed to women with secondary education, where the rate was 30 percent. Similarly, the nonmarital fertility rate demonstrated an upward trend with the rise in household wealth status, ranging from 34 percent among women from economically disadvantaged households to a peak of 38 percent among those from affluent households.

The findings indicate a notable disparity in nonmarital fertility rates, with a higher prevalence of 59 percent observed among working women in comparison to women who reported not currently being employed during the survey period. Non-working women, on the other hand, exhibited a substantially lower nonmarital fertility rate of 22 percent. These disparities were highly statistically significant. Similarly, nonmarital fertility rates exhibited significant variations based on a woman's occupation. Women involved in household and domestic services, agricultural work, and

professional/managerial roles tended to experience higher nonmarital fertility rates compared to women who were not employed or had no specified occupation.

The nonmarital fertility rate also exhibited variations based on a woman's religion, type of place of residence, and geographical region. Comparatively higher rates of nonmarital fertility were observed among Catholic and Protestant women, in contrast to those of Islamic or other religious affiliations. Among these groups, women following Islam had the lowest nonmarital fertility rate at 19 percent, while Protestant women demonstrated the highest rate. Nonmarital fertility rates were found to be higher among rural women compared to their counterparts residing in urban areas. Nonmarital fertility rates displayed a notable disparity among women in different regions. Specifically, women in Central and Nairobi exhibited relatively elevated rates at 45 and 43 percent respectively, surpassing those in other regions. In contrast, the Northeastern region recorded the lowest nonmarital fertility rate at 8 percent.

Table 2: Nonmarital fertility levels according to the study variables, Kenya, 2022

Variable	Level of nonmarital fertility among women in the category		# of weighted cases
	%	95% CI	
*Current age***			
15-19	7.9	7.2 – 8.6	5619
20-29	44.2	42.8 – 45.6	5065
30-39	88.4	86.7 – 90.0	1490
40-49	93.0	91.1 - 95.1	602
*Cohabiting Status***			
Not Cohabiting	23.5	22.6- 24.3	10,438
Cohabiting	90.2	88.9 - 91.4	2339
*Education***			
None	50.6	43.8 – 57.4	213
Primary	46.2	44.5 – 47.9	3279
Secondary	30.0	28.9 – 31.1	6516
Higher	35.5	33.7 – 37.3	2769
*Household wealth status***			
Poor	33.5	32.0 – 34.9	3948
Middle	34.0	32.1 – 35.9	2403
Rich	37.7	36.5 - 38.8	6428
*Current work Status***			
Working	59.2	57.8 – 60.6	4718
Not working	21.9	21.0 – 22.8	8059
*Occupation***			
Not working	18.8	17.9 – 19.7	7111
Professional/Managerial	53.6	50.8 - 56.3	1272
Service/sales/clerical	58.0	55.4 – 60.6	1393
Agricultural work	58.3	55.5 - 61.1	1209
Household and Domestic	59.2	55.9 - 62.4	909
Manual	55.4	52.1– 58.6	883
*Religion***			
Catholic	36.7	34.8 - 38.6	2574
Protestant	37.7	36.6 - 38.7	7822
Islam	12.6	10.3 - 14.9	792
Others	35.7	33.5 - 38.1	1588
*Type of place of residence***			
Urban	37.5	36.2 - 38.8	5550
Rural	34.3	33.2 - 35.4	7227
*Region of residence***			
Nairobi	43.1	40.8 - 45.3	1897
Central	44.8	42.5 – 47.1	1827
Coast	25.7	23.1 – 28.3	1055
Eastern	37.5	35.1 – 39.8	1614
Nyanza	32.0	29.6 – 34.5	1409
Rift Valley	37.6	35.9 – 39.2	3365
Western	23.4	21.1 - 25.6	1334
Northeastern	7.6	4.4 – 10.7	276

3.3 Multivariate Analysis results

Table 3 presents the results of logistics regression analysis. Multivariate results are presented in the final column of the table.   Before conducting the regression analysis, diagnostic tests were conducted to assess the potential presence of multicollinearity among the included variables. The results of these tests indicated that there were no issues of multicollinearity among the variables used in the analysis. Consequently, all the independent variables were retained for inclusion in the subsequent logistic regression analysis.

To begin, a bivariate logistic regression analysis was performed in order to obtain the unadjusted odds ratios (OR), which can be found in the second column of Table 3. Subsequently, a comprehensive multivariate logistic regression was undertaken, encompassing all variables, to compute the adjusted odds ratios (aOR) as displayed in the final column of Table 3. Although bivariate logistic results are presented in Table 3, the primary emphasis of this subsection centers around presenting the multivariate findings (aOR), with a focus on highlighting statistically significant results at a confidence level of 95% or higher.

The results of the multivariate model reveal a statistically significant association between all the explanatory variables and nonmarital fertility. It is important to highlight that the effects observed for the majority of variables underwent a significant reduction within the multivariate model, when contrasted with their initial impacts in the bivariate analysis.

The likelihood of experiencing nonmarital fertility displayed a discernible upward trend with increasing age of the women. Notably, women within the 30-39 age bracket and those falling into the 40-49 age range exhibited significantly elevated likelihoods, being approximately 53 times more likely (95% CI: 42.41, 66.81) and a substantial 96 times more likely (95% CI: 66.99, 137.54) respectively, to experience nonmarital fertility when contrasted with younger women within the 15-19 age bracket. Likewise, women who indicated that they were cohabiting with their partners exhibited a significant increase in the likelihood of experiencing nonmarital fertility. Specifically, they were nearly 12 times more likely (95% CI: 10.02, 13.97) than those who had never cohabited to experience nonmarital fertility.

While the bivariate analysis initially suggested a noteworthy negative association between education and nonmarital fertility, the multivariate analysis revealed a more nuanced pattern. Specifically, among the various educational levels, it was observed that women with higher education exhibited a statistically significant decrease in the likelihood of experiencing nonmarital fertility compared to women with no education. In fact, the odds of experiencing nonmarital fertility for women with higher education were 62 percent lower (95% CI: 0.23,0.65)   than those with no education. In the same vein, a similar trend emerged for women belonging to different income brackets. Notably, women residing in middle-income households and those situated in affluent households demonstrated significantly reduced probabilities of experiencing nonmarital fertility when contrasted with women from impoverished households. Specifically, the odds of encountering nonmarital fertility for women in middle-income households were 25 percent lower, while for women in affluent households, the odds were even lower by 41 percent compared to women in poor households.

The findings reveal a notable association between the current work status of women and nonmarital fertility. Women who indicated that they were currently employed exhibited a distinct positive association, displaying significantly higher odds (32 percent) compared to women who reported being not employed. Similarly, disparities were observed across different occupational categories, wherein women in various professions displayed significantly elevated likelihoods of encountering nonmarital fertility when compared to women without employment or occupation. It's worth highlighting that women engaged in household and domestic occupations were particularly noteworthy, being 2.26 times more likely to experience nonmarital fertility when contrasted with women without any employment or occupation.

Consistently observed in both the bivariate and multivariate analyses, a significant association was found between religion and nonmarital fertility. Women who identified with the Islamic faith demonstrated a significant difference, being notably less likely to experience nonmarital fertility in comparison to Catholic women or other Christian denominations. Specifically, their odds of encountering nonmarital fertility were 66 percent lower than those of Catholic women.

Place of residence and region of residence also emerged as significant factors associated with nonmarital fertility. Women residing in rural areas exhibited higher odds (35 percent) of experiencing nonmarital fertility when compared to their urban counterparts. Regarding regional disparities, noteworthy patterns were observed. Women residing in the Coast, Eastern, Western, and North Eastern regions displayed substantially differing odds of experiencing nonmarital fertility when compared to women living in Nairobi. Specifically, women in the Coast region had 47 percent lower odds, those in the Eastern region had 31 percent lower odds, those in the Western region had 60 percent lower odds, and those in the North Eastern region had a notable 89 percent lower odds of experiencing nonmarital fertility compared to women in Nairobi.

Table 3: Unadjusted and adjusted multivariate logistic regression results on nonmarital fertility, Kenya: 2022 KDHS

Explanatory variables	Unadjusted Model		Adjusted Model	
	OR	95% CI for OR	aOR	95% CI for aOR
Current age				
15-19 [Ref Cat.]	1.00	-	1.00	
20-29	9.27***	8.27 – 10.34	9.03***	7.84 – 10.39
30-39	88.80***	73.77 – 106.97	53.23***	42.41 – 66.81
40-49	157.28***	113.13 – 218.67	95.63***	66.49 – 137.54
Cohabiting Status				
Never Cohabited [Ref Cat.]	1.00		1.00	
Cohabiting	30.00***	26.00 – 34.65	11.83***	10.02 – 13.97
Education				
None [Ref Cat.]	1.00		1.00	
Primary	0.84**	0.63 – 1.10	1.06	0.87 – 2.45
Secondary	0.42***	0.32 – 0.55	0.94	0.57 – 1.57
Higher	0.54***	0.41 – 0.71	0.38***	0.23 - 0.65
Household wealth status				
Poor [Ref Cat.]	1.00		1.00	
Middle	1.02	0.92 – 1.14	0.75***	0.63 – 0.86
Rich	1.20***	1.10 – 1.31	0.59***	0.49 – 0.71
Current work Status				
Not Working [Ref Cat.]	1.00		1.00	
Working	5.16***	4.77 – 5.58	1.32**	1.09 – 1.59
Occupation				
Not working / No occupation [R Cat.]	1.00		1.00	
Professional/Managerial	4.98***	4.39 – 5.56	1.63***	1.29 – 2.06
Service/sales/clerical	5.97***	5.28 - 6.74	1.76***	1.40 – 2.21
Agricultural work	6.04***	5.31 – 6.88	1.38**	1.07 – 1.78
Household and Domestic	6.25***	5.41 – 7.23	2.26***	1.76 – 2.90
Manual	5.36***	4.63 – 6.19	1.66***	1.29 – 2.13
Religion				
Catholic [Ref Cat.]	1.00		1.00	
Protestant	1.04	0.95 – 1.14	0.96	0.84 – 1.09
Islam	0.25***	0.20 – 0.31	0.34***	0.24 – 0.48
Others	0.94	0.84 – 1.09	0.94	0.78 – 1.23
Type of place of residence				
Urban [Ref Cat.]	1.00		1.00	
Rural	0.87**	0.81 – 0.93	1.35**	1.14 – 1.59
Region of residence				
Nairobi [Ref Cat.]	1.00		1.00	
Central	1.07	0.94 – 1.22	0.95	0.78 – 1.16
Coast	0.46***	0.39 – 0.54	0.53***	0.41 – 0.68
Eastern	0.79**	0.69 – 0.91	0.69**	0.55 – 0.86
Nyanza	0.62***	0.54 – 0.72	1.11	0.89 – 1.39
Rift Valley	0.79**	0.71 – 0.89	0.88	0.73 – 1.05
Western	0.40***	0.35 -0.47	0.73*	0.58 – 0.93
Northeastern	0.11***	0.07 – 0.17	0.34***	0.17 – 0.65

4. Discussion

This study aimed to assess the current status of nonmarital fertility levels in Kenya, along with their variations, and to identify the factors associated with nonmarital fertility. To achieve these objectives, the study utilized data from the 2022 Kenya Demographic and Health Survey, which is the most recent and nationally representative survey data available. The study incorporated factors that prior research has identified as closely associated with nonmarital fertility in other countries, especially in Sub-Saharan Africa. As a result, this study offers empirical insights into the levels of nonmarital fertility in Kenya and the sociodemographic factors associated with it.

The descriptive findings highlight a significant and upward trend in nonmarital fertility. The study reveals a prevalence of nonmarital fertility at 35.7%, indicating a notable increase from 29.9% in 2008 and 31.8% in 2014. It is worth noting that this prevalence is slightly lower than recent rates reported in specific Sub-Saharan African countries [8,9, 24, 53] In South Africa, the nonmarital fertility in South Africa was estimated to be high as 55.52 percent for the year 2017 [53]. In Ghana a nonmarital fertility level of 40 percent in Ghana for the year 2014 was found [8] while in Nigeria a nonmarital fertility prevalence of 42 percent was reported for the year 2018 [9]. Just like in Kenya, in South Africa as well in both Ghana and Nigeria nonmarital fertility levels were found to be on an upward trajectory.

Moreover, the bivariate analysis reveals statistically significant disparities in the prevalence of nonmarital fertility based on women's age, cohabitation status, current employment, household wealth index, present employment status, occupation, religious affiliation, as well as place and region of residence. For instance, the incidence of nonmarital fertility displays an upward trend with increasing woman's age. It starts at a relatively low 8% among young women aged 15-19 and rises significantly to reach 93% among women in the 40-49 age group.

In the results of the multivariate logistic regression, all the independent variables remained significantly associated with nonmarital fertility. Concerning a woman's age, the likelihood of experiencing nonmarital fertility continued to rise with age. Women in the 30-39 age bracket and those in the 40-49 age range were 53 and 96 times more likely, respectively, to experience nonmarital fertility compared to younger women aged 15-19. This result aligns with findings from other research as well, where age has been consistently identified as a significant determinant of nonmarital fertility [5, 8, 54]. This phenomenon could potentially be attributed to the aspirations of older never-married women to become mothers. Several studies have highlighted that some women might not prioritize marriage but strongly desire motherhood, as children contribute a sense of purpose to their lives [55]. Furthermore, older women may choose to bear children out of wedlock as they age, in order to prevent the possibility of remaining childless once they reach menopause. This decision is often made to avoid the significant stigma and disadvantages commonly linked to childlessness in later stages of life.

Cohabitation status is found to be significantly associated with nonmarital fertility. The results show that cohabiting women have significantly elevated likelihood of experiencing nonmarital fertility compared to their non cohabiting counterparts. Similar results have been found elsewhere [8]. This result implies that some women in Kenya use cohabitation is alternative to marriage as an avenue for childbearing and childrearing.

In addition to the above demographic correlates, the study provides evidence of certain socio-economic and cultural factors that are significantly associated with nonmarital fertility. Women education attainment is significantly associated with nonmarital fertility with women with higher education being less likely to experience nonmarital fertility compared to women with no education. Women with no education have significantly higher risks of nonmarital fertility. Similar results have been found elsewhere [8,9, 54].

Similarly, household wealth status is a determinant of nonmarital fertility. Women residing in middle-income households and those situated in affluent households demonstrated significantly reduced probabilities of experiencing

nonmarital fertility when contrasted with women from poor households. Women in economically disadvantaged households exhibit greater risks of nonmarital fertility. This result is in support of similar studies in Africa [5, 8, 54].

The results revealed significant association between the current employment status of women and nonmarital fertility. Women who indicated that they were currently employed exhibited higher nonmarital fertility risks compared to women who reported being not employed. A similar result has been found elsewhere [8]. Further, the study found notable disparities across different occupational categories, wherein women in various occupations displayed significantly elevated risks of nonmarital fertility when compared to women without employment or occupation. The underlying reasons behind the increased risks of nonmarital fertility among currently employed women and those in distinct occupational categories are not yet fully elucidated. One plausible explanation is that marriage can one of the obstacles making it less likely for a woman to participate in the labour market. Therefore, we expect higher singlehood among those working women than among those not in the labour force [56]. Another possibility is that some women may have had nonmarital children prior to their current employment. However, it remains unclear why these specific groups exhibit elevated risks. Further investigation is warranted to shed light on these unexpected findings. Subsequent research endeavors could potentially uncover the factors contributing to these patterns and provide a more comprehensive understanding of the relationship between employment status, occupational categories, and nonmarital fertility.

Religious affiliation emerged as a significant factor linked to nonmarital fertility. A notable distinction was observed between women identifying with the Islamic faith and those of Catholic or other Christian denominations. Islamic-affiliated women exhibited a significantly lower likelihood of experiencing nonmarital fertility compared to their Catholic and other Christian counterparts. Interestingly, these findings deviate from a recent study conducted in Nigeria, where Muslim women demonstrated significantly higher risks of nonmarital fertility [54]. It's important to note that these results contrast with those from a study conducted in Ghana, which found no significant association between religion and nonmarital fertility [8]. The reduced likelihood of encountering non-marital fertility can be attributed to the strong influence of the Islamic religion, which actively discourages sexual relations outside of marriage. Additionally, Islam places significant emphasis on early marriage and the establishment of a two-parent family structure [9, 55].

Furthermore, the study revealed that both the place (rural-urban) and specific regions of residence play pivotal roles in relation to nonmarital fertility in Kenya. Notably, women living in rural areas demonstrated elevated odds of encountering nonmarital fertility in contrast to their urban counterparts. Moreover, women residing in the Coast, Eastern, Western, and North Eastern regions exhibited significantly lower risks of experiencing nonmarital fertility when compared to those living in Nairobi. These findings align with the results obtained from similar studies conducted elsewhere [8, 9].

The elevated risk of nonmarital fertility among rural women can be attributed to a combination of factors, including limited access to family planning services, lower educational attainment, and a scarcity of employment opportunities. Conversely, the heightened likelihood of nonmarital fertility among women residing in Nairobi could be associated with a notable majority of them being presently employed and enjoying economic independence, affording them the autonomy to make personal choices regarding fertility. Being presently in employment has been associated with a heightened risk of experiencing nonmarital fertility.

5. Conclusions

In summary, the findings from this study highlight a moderately high prevalence of nonmarital childbearing, with a discernible upward trajectory. This phenomenon is closely intertwined with the socioeconomic and demographic attributes of women. Specifically, the research highlights that woman's age, cohabitation status, education, household

wealth status, employment status, occupation, religion, place and region of residence all exert an influence on the occurrence of nonmarital fertility. Specifically, the prevalence proves higher among older women, those with limited or no education, those belonging to poor households, as well as among Catholics and other Christian denominations. Likewise, a heightened prevalence is observed among women living in rural areas and those residing in Nairobi.

In light of these insights, the study advocates for multifaceted interventions. These include enhancing the educational attainment of women and girls, simultaneously addressing poverty across the country. Furthermore, it emphasizes the importance of raising awareness among women, parents, and various stakeholders about the adverse consequences associated with nonmarital childbearing.

To curb the incidence of nonmarital childbearing, particularly among young women, the study underscores the need for intensified efforts in promoting access to reproductive health information and services. By empowering women, particularly young women, with the knowledge and resources necessary to make informed choices, the aim is to prevent nonmarital childbearing. This comprehensive approach aligns with the overarching goal of mitigating the impact of nonmarital childbearing and fostering a healthier reproductive landscape.

Moreover, the study underscores the importance of additional research to delve into the underlying factors contributing to the elevated risks of nonmarital fertility among women currently employed and those in various occupations, as opposed to their employed counterparts. Further investigation is warranted to uncover the nuances behind why women in the Nairobi region exhibit a heightened likelihood of experiencing nonmarital fertility compared to those in other regions like Coast and North Eastern. Such in-depth inquiries can provide valuable insights for crafting targeted interventions and policies to effectively address these regional and occupational disparities.

Furthermore, the study emphasizes the significance of conducting further research to comprehensively explore the fundamental factors are associated with the increased likelihood of nonmarital fertility among women who are presently employed and those engaged in different occupations, in contrast to those who are unemployed. In addition, a more extensive investigation is necessary to reveal the intricacies of why women in the Nairobi region display a greater propensity to experience nonmarital fertility when compared to their counterparts in other regions, such as Coast and North Eastern. These thorough investigations have the potential to offer valuable insights that can be utilized to formulate precise interventions and policies aimed at effectively tackling these disparities in both regional and occupational contexts.

This study focused on only never married women. It did not include divorced or widowed women due to lack data. The exclusion of such women may understate the extent of non-marital childbearing in the country. Therefore, there is need to collect data on the date of divorce or widowhood among such women in future national surveys such as DHS.

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