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Regional Variation in Early Marriage in Kenya

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Abstract:
Background: This study seeks to the establish the association between region and early marriage and whether or not the association has changed over time. Method: The study used a national representative sample of 21315 ever married women aged 20-49 years drawn from the 2014 Kenya Demographic and Health Survey. Descriptive statistics and logistic regression analysis were used to analyse the data. Results: The study found early marriage prevalence of 32.4% [95% CI: 31.81 – 33.06] and considerable regional variation. At the national level, early marriage was significantly associated with region [Rift Valley: aOR =1.22, 95%; 1.07 – 1.39, p value = 0.000; Western: aOR=1.31, 95%; 1.12 – 1.52, p value = 0.000; Nyanza: aOR =2.08, 95%; 1.80 – 2.40, p value = 0.000; North Eastern: aOR=0.63, 95%; 0.45 – 0.82, p value = 0.05; Eastern: aOR= 0.84, 95%; 0.72 – 0.97, p value = 0.05], education [primary education: aOR= 0.63, 95% CI ; 0.56 -0.70; secondary education: aOR= 0.201, 95% CI; 0.18- 0.24, higher education: aOR= 0.05, 95% CI; 0.04 - 0.06], household wealth status [poor: aOR= 1.31, 95% CI; 1.20 – 1.44; middle level: aOR=1.24, CI; 1.13 – 1.36], religion [Muslim: aOR= 1.36, 95% CI; 1.14 – 1.61, other non-Christian faith: aOR= 1.28, 95% CI; 1.03 - 1.59], premarital sex [yes: aOR= 1.91, 95% CI; 1.78 – 2.05] , pregnancy [yes: aOR= 1.44, 95% CI; 1.24 – 1.68] and age cohort [30-39: aOR = 0.71, 95% CI; 0.66 – 0.77, 40-49: aOR= 0.80, 95% ; 0.74 – 0.87]. The study also established region specific drivers of early marriage. Lack of education, premarital sex and premarital pregnancy were key drivers in all the regions. Poverty and religion were drivers in the majority of the regions.

Keywords: Early marriage, Region, prevalence, variation, Kenya

1. Introduction

Early or child marriage is referred to as a marriage or union, whether formal or informal, in which a girl lives with a partner as if married before the age of 18 [1,2] and is illegal in many contexts [3]. Globally, about 12 million girls are married before age 18 every year [4]. It is estimated that more than 120 million girls will marry before their 18th birthday by 2030. Early marriage prevalence rates are highest in South Asia (285 million, 44%) and sub-Saharan Africa (SSA) (115 million, 18%), and low in the Middle East and North Africa (35 million, 5%) [5]. It is projected that the number of girls married as children will double by 2050 and Africa will become the region with the highest prevalence if no pragmatic interventions are taken [5, 6]. In SSA, 35% of young women were married before the age of 18 and the global burden of early marriage is shifting from South Asia to SSA [6]. In Kenya, early marriage has been estimated at 25-30% [7, 8].

Early marriage is associated with many adverse demographic, socio-economic and health consequences and implications. Early marriage is a key driver of adolescent bearing. For instance, 90% of adolescent pregnancies in developing countries are married girls [5]. It is significantly associated with high fertility and poor pregnancy spacing, including repeat childbirth in less than 24 months, multiple unwanted pregnancies [9,10]. Early marriage is a violation of human rights since it deprives girls of many opportunities such as the right to health, safety and education [9, 10]. This deprivation also negatively affects the girl's future children, leading to an intergenerational cycle of disadvantages [10, 11]. Furthermore, early marriage is fraught with adverse health consequences such as increased risk of maternal morbidity and mortality, obstetric fistula, acquiring sexually transmitted diseases, including HIV and cervical cancer,

[12-14]. Child marriage has also been associated with adverse child outcomes, including preterm birth and intrauterine growth restriction, infant mortality and child malnutrition [10, 13, 15,16].

Early marriage has been illegal in Kenya since 2001 when the Children's Act became law. There are other laws such as the Sexual Offences Act, 2006 and the Marriage Act, 2014, which sets the age of marriage at 18 years, that also protect adolescent girls from early marriage. In addition, Kenya is a signatory to many international conventions and agreements such as Convention on Elimination of All Forms of Discrimination against Women (CEDAW), Universal Declaration of Human Rights, Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriages, The African Charter on the Rights and Welfare of the Child and the Protocol to the African Charter on Human and People's Rights on the Rights of Women in Africa. In 2013, the Kenya Government through the Ministries of Health and Education committed along with several other African countries, to ending early marriage by the end of 2020 [17]. Furthermore, Kenya is committed to the attainment of the Sustainable Development goals (SDGS). Target 5.3 of the SDGs aims to eliminate all harmful practices, such as child, early, forced marriage and female genital mutilation by 2030. The achievement of this target is critical for the achievement of SDGs relating to poverty, food security, health, education, gender equality, economic growth, peace and justice.

However, despite the existence of the above laws, conventions, agreements and commitment to the achievement of SDGs, early marriage is still prevalent in the country [7, 8, 18-21]. At the national level, early marriage has declined very modestly over the last two decades; it declined from 28 % in 1993 to 25% and 22.9% in 2003 and 2014, respectively [21]. It is worthwhile to note that although early marriage has declined nationally, some regions such as Nyanza and North Eastern still have a high prevalence.

There is a scarcity of comprehensive and national studies on early marriage in Kenya. Most of the studies so far tend to be localized [16] and descriptive [8, 19, 21]. The extent to which early marriage varies by region and in the whole country and the associated factors need to be established so that appropriate interventions can be designed and implemented. Examining regional variation in early marriage permits identification of the factors that influence early marriage in each region. This information would be useful in designing and implementing appropriate interventions in regions with relatively high prevalence rates. Therefore, the objectives of this study are to examine the extent to which the prevalence of early marriage vary in the eight regions in Kenya, and to identify specific factors that influence early marriage in each region and at the national level.

The study used variables that have been found elsewhere to be closely associated with early marriage [22-34]. These variables include education, place of residence, religion, household wealth status, woman's work status, premarital sex and pregnancy. The study uses the data drawn from the 2014 Kenya Demographic and Health Survey which is the most recent nationally representative data.

2. Materials and Methods

2.1 Source of data

The data for this study is drawn from the 2014 Kenya Demographic and Health Survey (KDHS) that the Kenya National Bureau of Statistics (KNBS) and partners carried out in the whole country. It is a nationally representative survey designed to provide reliable data for the monitoring of demographic and health indicators, including early marriage, in the country. Thus, the 2014 KDHS 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 was carried out as part of the worldwide DHS program and it is the most recent KDHS data.

The 2014 KDHS sample was drawn from the Fifth National Sample Survey and Evaluation Programme (NASSEP V) that KNBS uses to conduct household-based surveys throughout the country. In the NASSEP V, each of the 47 counties was stratified into urban and rural strata, since Nairobi and Mombasa counties have only urban areas, giving a total of 92 sampling strata. The 2014 KDHS sample was designed to have 40,300 households from 1,612 clusters (enumeration areas (EAs)) spread across the country, 995 clusters in rural areas, and 617 in urban areas. Using a two-stage sample design, representative samples were selected independently in each of the 92 sampling strata. In the first stage, 1,612 EAs were selected with equal probability from the NASSEP V frame. In the second stage, 25 households were randomly selected from each of the selected EAs. The interviewers visited only the preselected households, and no replacement of the preselected households was allowed during the data collection. The details of the sampling methodology, as well

as an assessment of the quality of the data, are presented and discussed extensively in the first country report of the survey [19].

The 2014 KDHS interviewed a total of 31,079 women aged 15-49 years in the whole country. Out of these 31,000 women, a nationwide sample of only 21315 ever married women aged 20-49 years were selected for this study using the Statistical Package for Social Sciences (SPSS) software's command select cases if a certain criterion or condition is satisfied. The criteria used were whether or not a woman was ever married and aged 20-49 at the time of the 2014 KDHS. Only ever married women aged 20-49 years were automatically selected from the data set and used in this study.

2.2 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 the prevalence of early marriage in each region and according to the study's control variables. The calculations include percentage distributions of women aged 20-29 years according to whether they had early marriage classified by each region and control variable. Logistic regression analysis was used to establish the effects of the study variables on the likelihood of a woman marrying early, which is a dichotomous variable. Logistic regression analysis is the most appropriate analytical tool since the dependent variable is dichotomous (yes/ no nature) [35]. This was an efficient way to introduce the necessary controls since the dependent variable was dichotomous and explanatory variables that are categorical as in the case of this study. Since the logit coefficients do not have an intuitive interpretation because they represent effects of the log of the odds, the log of odds would be converted to odds ratios [OR] by exponentiation. Only the odds ratios with 95% confidence intervals were 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 been married as a child in comparison to a woman who would be in the appropriate reference group. The OR of the reference group or category was one (1.00). If the OR of a given category was greater than 1.00, this indicates greater likelihood of marrying early, and when the OR was less than 1.00, it indicated a lower likelihood of marrying early compared to the reference group. In this analysis, a variable was reported as having a significant effect, if its effect on early marriage was statistically significant at least at the 5 percent level of significance. Bivariate logistic regression analysis was used to investigate the unadjusted effect of each of the explanatory variables on early marriage, represented by the odds ratios [OR]. Multivariate logistic regression analysis was used to establish the net effects, [aOR], of the explanatory variables on early marriage in each region and at the national level.

In order to examine whether or not there has been a change in the prevalence of early marriage among the study population, the age cohort variable was included in the study. The age cohort variable has three different cohorts of all ever-married women based on their age at the time of the survey were grouped as follows; 20-29, 30-39 and the 40-49 age cohort. The women who were in the age 40-49 age cohort in 2014 were born between 1962 and 1972, those in the 30-39 age cohort were born between 1973 and 1983, and those in the 20-29 age cohort were born between 1984 and 1994. These cohorts are indicative of the cultural, socio- economic and political factors that have generally shaped the experiences of these women. Those in the 40-49 age cohort were born about, during and within ten years after independence since Kenya gained Independence in 1963, while those in the 30-39 age cohort were born 10-20 years after Independence, and those in the 20-29 age cohort were born 21-30 years into Independence.

2.2 Study variables

2.2.1 Dependent variable

In this study, the dependent variable is early marriage. It is a binary outcome variable that refers to any legal or customary marriage / union involving a girl before the age of 18 years. It is categorized as one [1] if the marriage occurred before age 18, otherwise zero [0] if the marriage occurred at age 18 or above age 18 years.

2.2.2 Independent variables

The independent /explanatory variables include the region of residence. The country has eight regions [former provinces]. These are Nairobi, Central, Coast, Eastern, Rift Valley, Nyanza, Western and North-Eastern. The other independent variables are women's level of education [no education, primary, secondary and higher education), type of place of residence [rural-urban], religion [Catholic, Protestant, Muslim, Other non- Christian faiths], woman's work

status [working or north working], household economic status [poor, middle, rich], exposure to mass media [yes, no], premarital sex experience by age 15 [yes, no] and premarital pregnancy experience by age 15 [yes, no].
It is worthwhile to note that the household economic status was represented by the household wealth index,which was computed by DHS using household assets and ownership [KNBS et al 2015]. This variable is classified as poor, middle and rich. Exposure to the mass media variable was computed from three variables comprising reading newspapers, watching television and listening to a radio at least once per week. A respondent was considered as having exposure to mass media, if she had been exposed to any one of the three at least once per week and not if she had no exposure to any of the three. It is therefore a binary variable with value one [1] if the woman has exposure, value zero [0] otherwise. The two variables on premarital sex and premarital pregnancy by age 15 were computed based on the information on sex at first sex, age at first marriage and age at first pregnancy/birth. Finally, the variable denoting age cohort [20-29, 30-39, 40-49] was in the study to take into account any trend in early marriage in each region and in the country as a whole.

3. Results

3.1 Profile of the study population

The socio-demographic profile of the study population is presented in Table 1. A total of 21315 women aged 20-49, were included in the study. Thirty-two [32] percent of the respondents married before the age 18 years and 68 % were married when they were adults. North Eastern [47%] had the highest prevalence of early marriage, followed by Nyanza [46%], Coast [38%], Western [36%], Rift Valley [35], Eastern [27], Central [22] and then Nairobi [20]. North Eastern had the highest percentage of respondents with no education [89%] followed by Coast [23%], while Central [1%] had the lowest percentage of respondents with no education. Nairobi [20%] and Nyanza [20] had the highest percentage of respondents with higher education while North Eastern [2%] had the lowest percentage.

Table 1: Percentage distribution of the respondents according to the study variables and region, 2014 KDHS

Variable	Region								All
	Coast	North Eastern	Eastern	Central	Rift Valley	Western	Nyanza	Nairobi	
Age at marriage									
< 18 years	38.2	47.4	27.1	21.7	34.7	36.4	45.7	19.9	**32.4**
≥18 years	61.9	52.6	72.9	78.3	65.3	63.6	54.3	80.1	**67.6**
Education									
None	22.6	89.2	6.2	1.1	12.3	4.0	2.0	2.1	**9.2**
Primary	52.2	6.9	65.6	52.6	53.5	64.6	63.7	38.4	**54.6**
Secondary	19.8	1.9	20.5	20.5	24.3	23.8	26.3	38.8	**26.0**
Higher	5.3	1.9	7.7	7.7	9.9	7.6	8.0	20.8	**10.1**
Place of residence									
Urban	49.4	32.4	25.7	41.4	32.3	17.8	29.0	100.0	**40.3**
Rural	51.6	67.6	74.3	58.6	67.7	82.2	71.0	0.0	**59.7**
Wealth status									
Poor	43.1	74.9	42.6	11.9	41.4	42.1	46.1	0.5	**34.4**
Middle	10.8	4.8	23.1	20.2	19.0	32.9	23.4	5.2	**19.0**
Rich	46.1	20.3	38.2	67.9	36.6	25.0	30.5	94.3	**46.6**
Work status									
Working	27.7	6.9	38.2	40.2	32.5	35.7	37.4	31.3	**34.1**
Not working	72.3	93.1	61.8	59.8	67.5	64.3	68.7	68.7	**65.9**
Religion									
Catholic	9.5	0.2	26.1	22.7	18.7	16.1	20.7	21.5	**19.3**
Protestant	49.1	1.9	69.5	76.2	76.9	81.5	78.0	74.0	**71.7**
Muslim	32.8	97.6	3.0	0.2	1.2	2.1	3.6	3.6	**6.9**
Others	8.6	0.2	1.4	0.7	3.2	0.3	0.5	0.5	**2.1**

Had a premarital sex by age 15									
Yes	23.3	19.9	26.7	19.2	29.1	36.1	40.1	20.5	**27.8**
No	76.7	80.1	73.7	80.8	70.9	63.9	59.9	79.5	**72.2**
Had a premarital pregnancy by age 15									
Yes	2.7	19.9	26.3	19.2	29.1	4.0	7.7	3.8	**4.1**
No	97.3	80.1	73.7	80.8	70.9	96.03	92.3	96.3	**95.9**
Mass media Exposure									
Yes	61.8	23.9	70.2	90.2	75.5	75.1	73.7	93.2	**76.0**
No	38.2	76.1	29.8	9.8	24.5	24.9	26.3	6.8	**24.0**
Age cohort									
20-29	41.8	41.3	36.2	34.2	43.2	39.6	40.5	50.8	**41.1**
30-39	38.6	39.5	36.7	38.5	33.9	35.0	37.1	36.1	**36.0**
40-49	22.6	19.2	27.1	27.3	22.9	25.4	22.4	23.1	**22.9**
N [weighted]	**2098**	**464**	**3043**	**2766**	**5361**	**2165**	**2842**	**2564**	**21315**

Except for Nairobi [0%], the majority of the respondents in all other regions lived in rural areas. At the national level, 60% of the respondents lived in rural areas. North Eastern [75%] of the respondents belonging to poor households, followed by Nyanza [46%], Eastern [43%], Western [42%] and Rift Valley [41%]. Central [12%] and Nairobi [1%]. Nairobi [94%] followed by Central [68%] had the majority of the respondents belonging to rich households. Coast had 46% of the respondents reporting belonging to rich households.

North Eastern [93%] had the highest percentage of unemployed respondents followed by Coast [72%], Nyanza [69%], Nairobi [69%], Rift Valley [67%], Western [64%], Eastern [62%] and then Central [60%]. Protestants were the majority in all the regions except in North Eastern in which the Muslims [98%] were the majority. Nyanza [40%] followed by Western [36%] and Coast [23%] had relatively high percent of respondents who had premarital sex by age 15. Rift Valley [29%] followed by Eastern [26%] had relatively high percent of respondents who had premarital pregnancy while Coast [3%], Western [4%] and Nairobi [4] had the lowest percent. Mass media exposure was high in all the regions with the exception of North Eastern [24%].

2.2 Bivariate Analysis

Table 2 shows the differentials in the prevalence of early marriage in each region and at the national level according to the selected explanatory variables. The results depict statistically significant variation in the prevalence of early marriage in each region and at the national level in relation. Education was negatively and significantly associated with early marriage in all the regions. In all the region and at the national level, the percentage of women who married early declined with the level of education. However, there were marked differences in the association of the respondent's level of education and early marriage in each region. Among the respondents with no education, the highest percentage who married early was found in Nyanza [68%] whereas their counterparts in Nairobi had the lowest percentage of early marriage [38%].

The results show that, with the exception of Nairobi, early marriage was higher in rural than in urban areas in each region and at the national level. However, the association was statistically significant only in Coast, Eastern, Rift Valley, Western and Nyanza. Similarly, in each region and at the national level the prevalence of early marriage varied significantly according to the woman's household economic status. The prevalence of early marriage declined with the increase in household wealth index; it was highest among women belonging to poor households and lowest among women belonging to rich households.

In each region and at the national level, the prevalence of early marriage was higher among women who never worked. However, the association was statistically significant only in Eastern, Nairobi and at the national level. Similarly, there were marked differences in the association between religion and early marriage in the regions. Except in the Coast, Rift Valley and Nairobi, Muslims in each of the other regions had the highest percentage of women who married early. Religion was significantly associated with early marriage in Coast, Eastern, Rift Valley, Central, Western and Nairobi but not in North Eastern and Nyanza. It was also significantly associated with early marriage at the national level.

Table 2: Percentage distribution of the respondents who had an early marriage according to the study variables and region, 2014 KDHS

Variable	Region								All
	Coast	North Eastern	Eastern	Central	Rift Valley	Western	Nyanza	Nairobi	
Education	***	***	***	***	***	***	***	***	***
None	60.9	49.4	58.6	41.9	52.0	58.6	67.9	37.7	**54.4**
Primary	42.6	40.6	31.6	32.3	44.4	45.4	56.5	32.3	**41.4**
Secondary	9.9	11.1	12.7	12.0	17.2	19.6	30.5	15.6	**17.0**
Higher	4.5	11.1	2.1	1.8	4.3	1.4	8.4	3.4	**3.7**
Place of residence	**		*		**	**	**		***
Urban	27.9	41.3	22.4	21.4	25.3	29.3	39.6	19.9	**25.1**
Rural	38.2	50.3	28.8	21.7	39.2	38.0	48.2	----	**37.4**
Wealth status	***	**	***	**	***	***	***	*	***
Poor	52.2	50.4	32.9	24.7	46.0	43.3	54.9	28.6	**44.9**
Middle	43.4	45.5	27.5	28.2	36.2	38.0	46.8	29.5	**35.9**
Rich	24.0	37.2	19.7	19.2	33.2	22.7	31.0	19.4	**21.8**
Work status			**					**	**
Working	36.8	40.6	25.0	21.6	33.2	37.9	44.4	23.3	**31.5**
Not working	38.8	47.9	28.5	21.8	35.5	35.6	46.0	18.3	**32.6**
Religion	**		***	*	***	*		**	***
Catholic	29.1	0.00	24.7	18.0	34.5	34.1	45.6	24.0	**30.0**
Protestant	30.9	40.0	26.8	22.7	24.3	36.3	45.7	18.9	**31.4**
Muslim	46.4	47.9	51.6	30.0	28.8	58.7	56.5	20.9	**45.2**
Others	58.6	0.00	38.6	22.2	50.6	42.9	41.7	0.00	**48.7**
Had a premarital sex by age 15	***	***	***	***	***	***	***	***	***
Yes	60.5	73.1	42.7	41.1	48.2	47.9	54.9	37.9	**48.4**
No	3115	41.0	21.6	17.0	29.2	29.9	40.0	19.9	**32.4**
Had a premarital pregnancy by age 15	***	***	***	***	***	***	***	***	***
Yes	69.6	46.5	60.2	54.4	58.9	57.0	60.0	32.7	**56.9**
No	37.4	38.2	27.2	20.6	33.8	35.6	44.5	19.4	**31.4**
Mass media Exposure	***	*	***		***	**	***		***
Yes	30.7	39.6	24.0	21.2	32.3	34.7	43.4	19.7	**29.2**
No	50.4	49.6	34.6	25.8	42.3	41.6	52.1	22.5	**42.5**
Age cohort		***	**		***	*		**	***
20-29	39.4	55.5	30.0	23.3	37.8	39.7	46.1	22.0	**34.8**
30-39	35.7	47.5	23.9	22.0	30.5	33.3	44.0	16.7	**29.4**
40-49	40.1	30.2	27.1	21.0	35.2	36.4	47.8	20.7	**33.4**
N [Weighted]	**2098**	**464**	**3043**	**2766**	**5361**	**2165**	**2842**	**2564**	**21315**

Notes: * $p \leq 0.05$, ** $p \leq 0.01$ and *** $p < 0.000$.

Both premarital sex and premarital pregnancy variables were highly associated with early marriage in each region and at the national level. In each region and at the national level, the prevalence of early marriage was higher among women who had premarital sex by age 15 and among those who had a premarital pregnancy than among women who had no such experience. For instance, at the national level, the prevalence was 48% among the women who reported having

premarital sex by the age of 15 compared to only 32 % among women who did not have premarital sex by the age of 15. Similarly, those who had a premarital pregnancy had the highest prevalence rate at 57% compared to only 31% among those who did not have a premarital pregnancy by age 15.

Exposure to mass media was significantly associated with early marriage in Coast, North Eastern, Eastern, Rift Valley, Western, Nyanza and at the national level. The prevalence of early marriage was higher among the women without exposure to mass media. For instance, at the national level, the prevalence was 43% among the women who had no exposure to mass media compared to 29 % among those who reported exposure to mass media.

Finally, in all the regions and at the national level, women in the 20-29 age cohort had the highest prevalence rate of early marriage. However, the age cohort was not significantly associated with early marriage in Coast, Central and Nyanza. It was only in North Eastern that the prevalence of early marriage declined with the age group. A U-shape pattern of early marriage in relation to age cohort was evident in Eastern, Rift Valley, Western and Nyanza.

3.3 Multivariate results

Since the focus of this study was on establishing factors associated with early marriage in each region and at the national level, multivariate logistic regression analysis was performed for each region and then for the country as a whole. Table 3 shows the results of logistic regression analysis for each region while Table 4 shows the results of the analysis carried out at the national level with all the study variables, including the region as a variable. Prior to the regression analysis, diagnostic tests for multicollinearity were carried out. No multicollinearity was encountered for the variables that were included in the analysis.

3.3.1 Regional level Analysis

Table 3 shows the results of regional level analysis in the form of adjusted odd ratios [aOR]. The table indicates the factors that had statistically significant relative effects on early marriage in each region. Education, premarital sex and premarital pregnancy by age 15 and age cohort were found to be significantly associated with early marriage in all the regions. Education was negatively associated with early marriage in each region whereas having premarital sex and premarital pregnancy by 15 were each positively associated with early marriage in each region. Their relative effects were significant at $p < 0.001$ in each of the regions. Type place residence had significant effect only in Central in which rural women had a significantly lower odds of having an early marriage. Work status was not significantly associated with early marriage in any of the regions.

Religion was significantly associated with early marriage in North Eastern, Eastern, Central, Western and Nyanza. It was significantly associated with early marriage in Coast, Rift Valley and Nairobi. In the regions where religion had a significant relative effect, being Muslim was significantly associated with higher odds of marrying early. For instance, in Western region, the Muslim women were 2.51 times more likely to marry early compared to the Catholic women.

Exposure to mass media was associated with early marriage only in the Rift valley and Nairobi. In the two regions, women who were not exposed to mass media had significantly higher odds of marrying early than the women who have exposure.

Table 3: Multivariate logistic regression results indicating effects [adjusted odds ratios] of the study variable on early marriage in each region, 2014 KDHS

Variable	Region							
	Coast	North Eastern	Eastern	Central	Rift Valley	Western	Nyanza	Nairobi
Education								
None [Ref]	1.00	1.00	1.00	1.00	1.000	1.00	1.00	1,00
Primary	0.59***	0.57***	0.37***	0.78*	0.76**	0.61***	0.59***	0.57***
Secondary	0.11***	0.18***	0.13***	0.24***	0.22***	0.20***	0.24***	0.22***
Higher	0.06***	0.16***	0.02***	0.03***	0.56***	0.12***	0.06***	0.05***
Place of residence								
Urban [Ref]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	----
Rural	1.05	0.95	1.08	0.97	1.15	0.95	0.94	----

Wealth status								
Poor	1.52***	1.30**	0.99	0.93	1.42***	1.46***	1.52***	1.05
Middle	1.42**	1.25**	1.03	1.18	1.24**	1.47***	1.27**	1.07
Rich [Ref]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work status								
Working [Ref]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Not working	1.03	1.01	1.13	1.13	1.01	0.96	1.03	0.67**
Religion								
Catholic	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Protestant	0.86	0.96	1.08	1.20*	1.02	0.99	0.93	0.96
Muslim	1.03	1.45**	1.46**	2.34***	1.18	2.51***	1.93***	1.10
Others	1.19	1.02	1.02	1.64***	1.14	2.15***	1.12	1.05
Had a premarital sex by age 15								
Yes	2.85***	4.01***	2.05***	2.36***	1.72***	1.59***	1.35***	2.66***
No [Ref]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Had a premarital pregnancy by age 15								
Yes	1.44***	1.89***	1.99***	1.62***	1.73***	1.38**	1.34***	0.82
No	1,00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mass media Exposure								
Yes [Ref]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	0.97	0.80	0.78	1.05	1.22*	1.09	0.98	1.30*
Age cohort								
20-29 [Ref]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30-39	0.68**	0.66**	0.76*	0.67*	0.66**	0.70**	0.89	0.64***
40-49	0.86	0.32**	0.83*	0.77*	0.74**	0.78*	1.03	0.82*
N [unweighted]	**2684**	**1184**	**3660**	**2214**	**6268**	**1929**	**3027**	**675**

Notes: * $p \leq 0.05$, ** $p \leq 0.01$ and *** $p < 0.001$.

Finally, age cohort was significantly associated with early marriage in Coast, North Eastern, Eastern, Central Rift Valley, Western and Nairobi. In all these regions, women belonging to the younger age cohort [20-29] had significantly higher odds of marrying early compared to the women in the 30-39 age cohort and those in the 40-49 age cohort.

3.3.2 National level Analysis

Table 4 shows the results of the national level analyses. In these analyses, region was included as an explanatory variable alongside the other explanatory variables. Column 2 of Table 4 indicates unadjusted [ORs] the results of bivariate logistic analysis with each of the explanatory variables whereas Column 3 depicts the multivariate logistic results [adjusted OR [aOR]]. However, in this subsection we report mainly the statistically significant multivariate results (aOR) at the confidence level of 95% or higher.

The results show that region was among the seven factors that were significantly associated with early marriage at the national level. The bivariate results show that women in Coast, North Eastern, Eastern, Rift Valley, Western, and Nyanza regions had significantly higher odds of marrying early compared to the women in Nairobi. For instance, among the women in North Eastern region, the odds of marrying early was 3.622 [95% CI= 2.95 – 4.45; *p* value = 0.000]. However, in the multivariate analysis, the effect of region of residence was substantially reduced. For instance, among the women in Coast the odds of marrying early was no longer statistically significant at the 95% confidence level. However, among women in North Eastern, and Eastern regions odds of marrying early were now lower compared to the women in Nairobi. For instance, among women in North Eastern the odds of marrying early was reduced from 3.622 to 0.625 [95%CI= 0.48 – 0.82; p value =0.001]. However, among the women in the Rift Valley, Western and Nyanza , odds of marrying early were still statistically higher. For instance, among women in the Nyanza region, the odds of marrying early were 2.082 [95% CI= 1.80 – 2.40; *p* value =0.000] having been reduced from 3.384 [*p* value =0.000].

In both the bivariate and multivariate analysis education was significantly and negatively associated with early marriage. Compared with women no education, women with higher education were 0.047 [0.04 – 0.06; *p* value = 0.000], times less likely to have married as children. Similarly, women with primary education were significantly less likely to marry early [aOR = 0.207, 95% 0.036 – 0.061, p value= 0.000].

Table 4: Unadjusted and adjusted multivariate logistic regression results on early marriage in Kenya: 2014 KDHS [N= 21640]

Variable	Unadjusted Model		Adjusted Model	
	OR	95% CI for OR	aOR	95% CI for aOR
Region				
Coast	2.486***	2.181 – 2.834	1.154	0.985 – 1.352
N. Eastern	3.622***	2.946 – 4.453	0.625	0.476 – 0.821
Eastern	1.498***	1.321 – 1.698	0.839*	0.724 – 0.973
Central	1.111	0.973 – 1.269	0.925	0.797 – 1.073
Rift Valley	2.138***	1.912 – 2.392	1.220**	1.069 – 1.394
Western	2.303***	2.021 – 2.624	1.305***	1.117 – 1.524
Nyanza	3.384***	2.996 – 3.823	2.082***	1.803 – 2.404
Nairobi (Ref Cat.)	1.000		1.000	
Education				
None (Ref Cat.)	1.000		1.000	
Primary	0.590***	0.536 – 0.649	0.626***	0.556 – 0.704
Secondary	0.171***	0.153 – 0.191	0.207***	0.180 – 0.237
Higher	0.032***	0.025 - 0.041	0.047***	0.036 – 0.061
Place of Residence				
Urban (Ref Cat.)	1.000		1.000	
Rural	1.787***	1.682 – 1.898	1.016	0.934 – 1.104
Household Wealth Status				
Poor	2.925***	2.737 – 3.125	1.311***	1.198 – 1.435
Middle	2.004***	1.850 – 2.171	1.239***	1.126 – 1.364
Rich (Ref Cat.)	1.00		1.000	
Work status				
Not working	1.071*	1.008 – 1.135	0.99	0.925 – 1.058
Working (Ref Cat.)	1.00		1.000	
Religion				
Catholic (Ref Cat.)	1.00		1.000	
Protestant	1.09	0.992 – 1.153	0.98	0.908 – 1.070
Muslim	1.925***		1.366***	1.142 – 1.609
Other non-Christian	1.834***		1.286***	1.028 – 1.586
Had premarital sex by age 15				
No (Ref Cat.)	1.000		1.000	
Yes	2.635***	2.476 – 2.805	1.916***	1.775 – 2.045
Had a premarital pregnancy /birth by age 15				
No (Ref Cat.)	1.000		1.000	
Yes	2.893***	2.523 – 3.523	1.440***	1.236 – 1.677
Age cohort				
20-29 (Ref Cat.)	1.000		1.000	
30-39	0.781***	0.731 – 0.831	0.712***	0.663 – 0.766

40-49	0.922*	0.856 – 0.993	0.798***	0.735 – 0.866
Mass media Exposure				
No	1.761***	1.678 – 1.911	0.950	0.878 – 1.029
Yes (Ref Cat.)	1.000			

As in the case of education, household wealth status was significantly associated with early marriage. Women from poor and middle level households were more likely to marry early compared with their counterparts from rich households; they were 1.31 [95% CI= 1.20 – 1.36, p value =000] and 1.24 [95%CI= 1.13 – 1.36; *p* value = 0.000] respectively, times more likely to marry early.

Religion was also found to have a significant effect on early marriage. Muslim and other non-Christian women were more likely to marry early compared to Catholic women. For instance, compared to the Catholics, Muslims women were 1.36 [95% 1.14 – 1.61; *p* = 0.000] times more likely to marry early. Both premarital sex and pregnancy by age 15 variables were significant associated with early marriage. Women who had premarital sex by the age of 15 years were significantly more likely to marry early compared to those who did not; they were 1.91 [95% CI =1.78 – 2.05, *p* = 0.000] times more likely to have early marriage. Similarly, women who had premarital pregnancy were also more likely to marry early; they were 1.44 [95%CI= 1.24 – 1.67; *p* value = 0.000] times more likely to marry early compared with their counterparts that did not have such an experience.

Finally, results on the net effects of age cohort variable indicate that older women, that is women in the 30-39 and 40-49 age cohorts were significantly less likely to marry early compared to the younger women i.e., those in the 20-29 age cohort. The adjusted odds ratios among in the women in the age cohorts 30-39 and 40-49 were 0.712 [95% CI= 0.66 – 0.77; *p* value = 0.000] and 0.798 [95% CI= 0.74 – 0.87; *p* value = 0.000], respectively.

4. Discussion

This study sought to examine the extent to which the prevalence of early marriage varies across and within the eight regions in Kenya, and to identify specific factors that are associated with early marriage in each region and also at the national level. The study used a nationally representative sample of 21315 women of the reproductive age [20-49]. The data was extracted from the 2014 Kenya Demographic and Health survey [KDHS]. This is the most recent KDHS data set in the country. Descriptive statistics [percentages and crosstabulation the associated chi-square test] and logistic regression analysis were used to analyze the data.

The study found 32.4% of the women married early. This prevalence rate is moderately high in comparison with those reported elsewhere in Sub-Saharan African and some countries in Asia [26-31]. Further the study found statistically significant variation in the prevalence of early marriage across the eight regions and at the national level. The prevalence of early marriage was highest in North Eastern followed by Nyanza and Coast. It was the lowest in Nairobi.

Similar results showing regional variation in early marriage have been found in other studies in Sub Saharan Africa and Asia [23-34]. In the Kenyan context regional variation in the prevalence of early marriage could be due to differences in women's education, level of socioeconomic development, ecological and cultural variations. In Kenya, there are significant socio-economic regional variations and the regions have been impacted differentially by modernization. Generally, due to historical and political reasons, Nairobi, Central and some parts of the Rift Valley are more economically developed than the other regions located at the periphery of the Capital City of Nairobi, which is the seat of government. The study found some evidence regional disparities in socio-economic development. North Eastern had the highest percentages of women with no education, poor, Muslim women and women who lived in rural areas. In addition, most of the women were not employed. Coast had relatively high percentage of unemployed women, Muslim women, women with no education, and poor women. Nyanza also had a high percentage of poor, unemployed and rural women. In addition, Nyanza had the highest percentage of women who had premarital sex by age 15. On the other hand, Nairobi and Central had high percentages of educated women and working women.

Furthermore, there are discernible regional cultural variations in Kenya, as one or two ethnic groups predominantly inhabit each of the eight regions. For example, Central region is predominantly inhabited by the Kikuyu, Coast region by Mijikenda, Nyanza by Luo and Kisii, Western region by Luhya, Eastern by Kamba, Embu and Meru, Rift Valley by Kalenjin, North Eastern by Somali and Boran, while Nairobi Province is metropolitan. Each ethnic group has its own social norms, values, and attitudes that may influence early marriage.

Education had a significant association with early marriage in all the eight regions and at the national level. The odds of early marriage consistently declined with the level of education. These results clearly show that no or less education leads to increased early marriage and therefore lower levels of education are associated with a higher probability of early marriage. Similar results have been found in other studies [22, 23, 29, 33, 36-42]. These results underscore the importance of education as a preventive measure against early marriage. Education increases knowledge and awareness of reproductive health, including the appropriate age for marriage and negative consequences of early marriage. Furthermore, education is a pathway to increased employment opportunities. Thus, a comprehensive response to the elimination of early marriage in the country should have a strong focus on girls' education and increasing their access to and uptake of basic education, including comprehensive sexuality education and life skills.

Household wealth status [wealth index] was significantly associated with early marriage in six regions and at the national level. In those regions and at the national level, women from poor and middle level households were more likely to marry early compared to their counterparts from rich households. This study therefore confirms the results of many previous studies that found a close association between poverty and early marriage, with women from poor households being significantly more likely to marry as children than their counterparts from rich households [7, 14, 27, 32, 33,38, 42]. Rich households, unlike poor households, are able to provide for the needs of their families and to educate their children, both girls and boys. Thus, poverty alleviation would significantly contribute to the reduction of the prevalence of early marriage in the country.

In the literature, religion has been found to be one of the determinants of early marriage in various countries [22, 29, 34, 36, 41, 42]. In this study, religion was found to be significantly associated with early marriage in five regions and at the national level. In the five regions and at the national level, Muslim women were more likely to marry early compared to Catholic women. Religious teachings and beliefs have been used as the justification for early marriage in many countries [3, 41]. In addition, premarital sex is considered as a religion taboo, particularly among Muslim communities [41]. Due to fear of premarital sex or pregnancy, early marriage is encouraged in situations when parents suspect that their adolescent daughter (s) is engaging in premarital sex [3, 36].

Premarital sex by age 15 years was one of the explanatory variables in this study. In each of the regions and at the national level, having premarital sex by 15 was significantly associated early marriage. Women who had premarital sex were significantly more likely to marry early compared to their counterparts who did not have premarital sex by age 15. Similar results have been found in a comparative study that included Tanzania and Burkina Faso [33]. In that study, women in Tanzania who had initiated premarital sex before age 15 were 2.15 times more to marry as early. The corresponding figure for such women in Burkina Faso was 2.50. These results provide empirical evidence that premarital sex is one of the key drivers of early marriage in each of the eight regions and in whole country.

Another important driver of early marriage found in this study is premarital pregnancy. This factor was significantly associated with early in each of the eight regions and also at the national level. Women who had premarital pregnancy /birth were significantly more likely to have early marriage compared to their counterparts without such experience. This finding is in agreement with the similar results found in Kenya [7, 38] and in Tanzania and Burkina Faso [33].

The key strength of this study lies in the use of data from the nationwide survey, the 2014 KDHS, and hence able to cover the entire country, unlike most of the previous studies. The second strength is the inclusion of many factors such as premarital sex by age 15, premarital pregnancy by age 15 and exposure to mass media. As indicated earlier, most previous studies did not include these variables as determinants of early marriage in the country. The third strength is establishing the determinants of early marriage in each region and at the national level. The fourth strength is the use of both cross tabulation and logistic regression analysis in the study. Crosstabulations and the associated Chi-square tests showed the differentials and strength of the association in the prevalence of early marriage according to the study variables. The logistic regression analysis showed both gross and net effects of each of the study variables on early marriage in each region and at the national level.

However, the study has a number of limitations. The data was secondary and cross-sectional. This type of data, cross-sectional, does not permit causal effect attribution of the observations made. Secondly, some of the variables such as household wealth status and work status were current status variables. They referred to the time of the survey, the conditions may have been different at the time the women married. This is more likely in the case for women who

married and moved away from their parents' households to live with their husbands as is the common practice in Kenya and in most Sub Saharan countries. It is possible that the household economic conditions of the woman's present family and the family in which she grew up may be different, particularly if the women tend to marry up the social ladder. No information on the characteristics of the household where the woman grew was collected during the 2014 KDHS. It is worthwhile to note that this data weakness is not unique to this study; it is a common issue in many previous studies on early marriage that used demographic and Health Survey data [27, 29, 30-33]. Future studies may overcome these limitations by obtaining the relevant sociodemographic information preceding marriage.

5. Conclusions

The study revealed an early marriage prevalence rate of 32.4% and the existence of considerable regional variation in the prevalence of early marriage in the country. The prevalence of early marriage was highest in North Eastern region, followed by the Nyanza and Coast region, and lowest in the Nairobi region. At the national level, the multivariate logistic regression analysis results show that region, education, household wealth status, religion, premarital sex, and pregnancy were significant determinants of early marriage. Higher prevalence of early marriage was consistently associated with Rift Valley, Western and Nyanza regions, among women with no or low level of education, who are poor, who were Muslim and other non -Christians, and those who engaged in premarital sex and or had premarital pregnancy by age 15. Further, younger women, [20-29], were associated with higher prevalence and women who were in the 30-39 and 40-49 age cohorts were associated with lower prevalence of early marriage.

The study also established region specific determinants of early marriage. In all the regions, lack of education, premarital sex and premarital pregnancy were the drivers of early marriage. Poverty and religion were other key drivers in the majority of the regions. Thus, the study recommends that given the considerable regional variation in the prevalence of early marriage, that national and devolved governments and other stakeholders should have policies and programs to address this problem that take into account the socio-economic and cultural context of each region. Secondly, the study recommends that improving the educational levels of girls and reducing poverty in the country coupled with efforts to sensitize adolescent girls, parents, and other stakeholders on the negative consequences of early marriage, and to prevent premarital sex and pregnancy among girls through improved access to reproductive health information and services. Furthermore, concerted efforts should be made to enforce laws on early marriage in the country.

Data availability

The 2014 KDHS data used in this study were sourced from the Demographic and Health Survey (DHS) program. The data set can be accessed from https://dhsprogram.com/data/available-datasets.cfm.

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Ethical Approval

Ethical approval was not required for this study because the data is secondary and is available in the public domain as indicated above.

Informed Consent Statement:

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