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Original Article

Investigating the Tempo Effect on Completed Fertility: The Effect of Age at First Cohabitation or Birth on Completed Fertility in Malawi, Africa

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Abstract

Background: Population growth is considered a problem in Malawi, Africa and fertility is reportedly a key factor in the growth of this population. The subject of studies on fertility-related factors has been period fertility rather than lifetime fertility. However, period fertility is reported to be associated with a tempo effect and therefore may not represent lifetime fertility accurately. The present study; therefore, examined whether age at first marriage or birth has an effect on lifetime fertility in Malawi, as it is the case with period fertility.
Methods: Secondary data from the Malawi Demographic and Health Survey were used for this study. The study was conducted from October 2015 to February 2016 and surveyed 24562 women of reproductive age (15-49 years). The research was limited to a subsample of 3583 women because the focus of this paper is on women aged 40-49 years. The number of children ever born was used to determine fertility. Analysis of variance and Poisson regression model were used as statistical tests. The multivariable association between the number of children ever born and the independent variables was predicted using the Poisson regression model, while the bivariate relationship was calculated using analysis of variance.
Results: The results of the bivariate analysis showed that age of first cohabitation (P=0.01) and age of first birth (P=0.01) were strongly associated with total number of births. Both unadjusted and adjusted Poisson regression models showed significant associations for multivariable outcomes. Accordingly, the number of children ever born was significantly associated with the following variables: an adjusted model with age of 26 years and older as the reference category, beginning cohabitation (AIRR=1.09, P=0.04) or first birth (AIRR=1.61, P=0.03) at age younger than 18 years; cohabitation (AIRR=1.09, P=0.04) or first birth (AIRR=1.48, P=0.03) at age of 18 to 21 years.
Conclusions: Based on the findings of the study, the study recommends stakeholders to support household income-generating capacity, expand access to education for both boys and girls, and maintain the use of modern contraceptives.

Keywords: Lifetime fertility, Age at first birth, First cohabitation, Malawi

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1. Introduction

Age at first marriage or birth of a child is associated with demographic outcomes such as fertility. The longer a woman cohabits or is married, the higher the risk of pregnancy. In traditional communities of Asia and Africa, marriage at a younger age or early birth of the first child has been found to be associated with higher fertility (1, 2). Malawi is one of the countries with a high fertility rate: a total fertility rate (TFR) of 4.4 children was reported in 2016. In addition, Malawi has one of the highest population densities in Africa (173.0 people per square kilometer), especially in the Southern African Development Community (SADC) (3, 4). In light of this, the government is committed to lowering the birth rate, which in turn would help slow population growth. The first population policy was introduced in 1994 and updated in 2013. The policy attempts to alleviate development problems caused by uncontrolled population growth and high birth rates (5). Subsequently, the total fertility rate (TFR) declined from 6.7 children per woman in 1992 to 4.4 children in 2015-2016 (3). The National Policy on Sexual and Reproductive Health and Rights envisages that the target of 4 children per woman would be achieved by 2022 before the policy would be revised for a lower fertility target (6). Therefore, it is desirable to examine the factors that influence fertility.

Educational attainment, rural or urban living, and household financial stability have been reported as the most important determinants of fertility in Malawi (3). Age at first cohabitation or marriage has also been identified as a factor (7, 8). However, published results are based on period fertility, which is often determined using TFR (8, 9).

Although TFR has the advantage of capturing ongoing fertility and providing more up-to-date information, it is reported to be associated with a tempo effect. Therefore, the cohort or completed fertility rate is thought to be a better measure of the actual reproductive experience of a group of women, although it has the disadvantage of representing past experience (9). To quantify completed fertility, women aged 40 to 49 years were used in this study, as recommended by MEASURE DHS, MEASURE DHS is a multinational program called DHS that conducts surveys to collect information on demographics and health. The website of MEASURE DHS provided the data set used in this study (10).

It is conceivable that period fertility indicates a decline in fertility among women in the current cohort. Since this may not be true once they stop having children, the perceived decline could also be spurious if used as a basis for predicting a continuing decline. As indicated earlier, studies available in Malawi on age at first cohabitation and period fertility have found that postponement of cohabitation is associated with lower childbearing and vice versa (7, 8). However, there are no studies on completed fertility and age at first birth in Malawi. In addition, no study has examined whether completed fertility has a significant tempo effect. Therefore, the primary objective of this study is to determine whether the completed fertility of a cohort in Malawi is affected (significantly) by the age of the cohort at first cohabitation or birth, as it is the case with period fertility. The results of this study may refute the use of period fertility in estimating completed fertility, if completed fertility should be found significantly different from period fertility. This may suggest that the tempo effect associated with period fertility is significant hence, policymakers and researchers would need to reevaluate whether period fertility should be used to estimate completed fertility. Otherwise, if the results would be similar to reported results of period fertility, then this study would reinforce the support of using period fertility to estimate completed fertility.

1.1. Conceptual Framework

Studies in developing countries, including Malawi, showed that household economic position, education, urban-rural location, religion, ethnicity, and working status, moderate the association between age at first cohabitation or birth and period fertility (11-13). Despite studies showing clear link of the moderating variables and period fertility, it has been argued that moderation effect can be arbitrarily extrapolated to the cohort's completed fertility (3, 7, 8). Notwithstanding, this study has used the dataset that is relatively updated and from a cross-sectional survey, it is possible that these factors have changed over time, so their moderating influence on age at first cohabitation or first birth and completed fertility may not be directly stated. However, their influence cannot be neglected.

Social, economic, and cultural factors that influence fertility can be identified through the mediation of the so-called "proximate determinants of fertility" (14). Changes in these proximate determinants directly affect fertility (14, 15). Marriage, postpartum infertility, abortion, and contraception are these immediate determinants. Because abortions are prohibited in Malawi unless they can save a pregnant woman's life, estimates of abortion rates are often difficult to obtain and may be inaccurate. Marriage risk is a variable of interest in this study; consequently, abortion and marriage were not considered as direct determinants of fertility. Contraception, on the other hand, is the only proximate factor used to determine fertility in this study because it can also prolong postpartum infertility (which is also a proximate determinant). In Malawi, a study found that between 1992 and 2010, lower fertility was associated with higher contraceptive prevalence rates (16).

The independent variables affecting cohort completed fertility are shown in Figure 1. The conceptual framework for this analysis of these relationships was developed from the literature reviewed.

2. Methods

2.1. Study Area

Cross-sectional primary research was conducted to collect the relevant data. Since its inception in 1992 in Malawi, this Demographic and Health Survey (DHS), cross-sectional study, has been conducted on average every five to seven years. The survey in question was conducted in Malawi between October 2015 and February 2016 under the direction of the country's National Statistics Office (3). Malawi is a landlocked country in

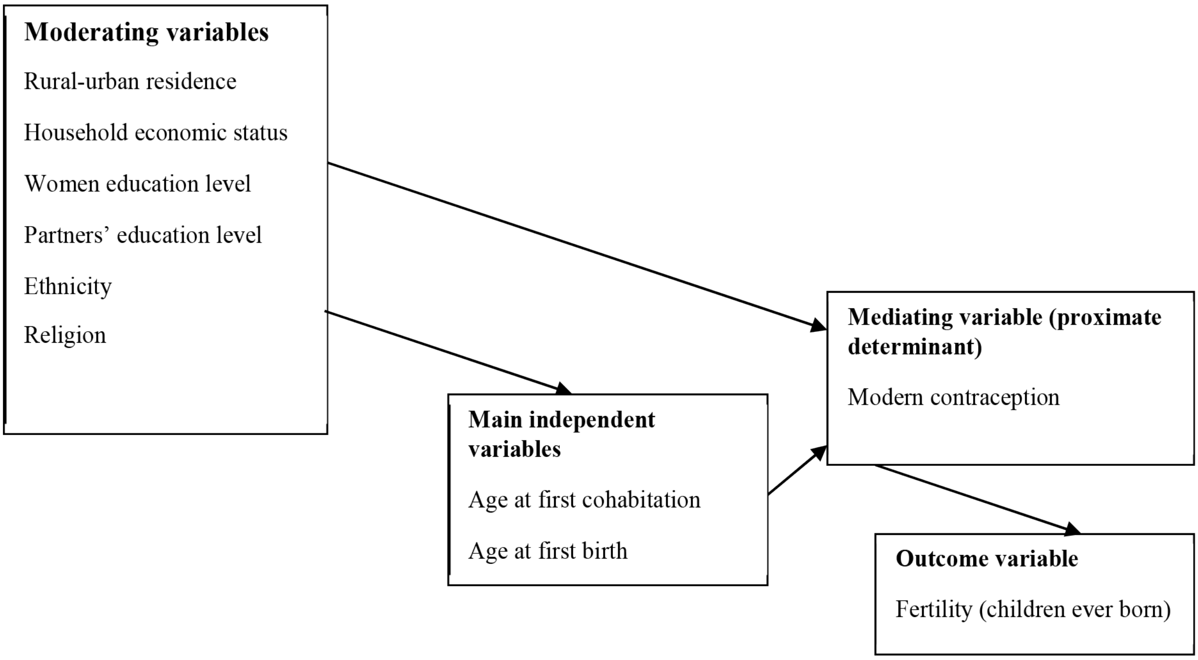

Figure 1: The figure shows the conceptual framework of possible mechanisms through which age at first cohabitation or birth impact upon cohort's completed fertility.

southern Africa, borders of Mozambique, Zambia, and Tanzania. According to 2018 census data, an estimated 17.6 million people live in the country (8). In terms of Gross Domestic Product (GDP) per capita, Malawi remains one of the poorest countries in the world, ranking fourth. The country's economy depends mainly on agriculture, which employs about 80% of the population (17). From 6.7 in 1992, TFR was 4.4 children per woman in 2015-16 (8).

2.2. Data Source and Sampling Design

Secondary data from the Malawi DHS of 2015-16 were used for the study. The household and women files were combined for analysis. With a response rate of 97.7%, 24562 of the 25146 target women were successfully interviewed (3). Inclusion/exclusion criteria were used to come up with the target demographic group, women aged 40-49 years. In this way, a subsample of 3583 women was formed. The exclusion/inclusion criteria used were as following:

i. First the categories of age-group variable were recoded in SPSS; thus, age groups of 19-24, 20-24, 25-29, 30-34, and 35-39 were combined and assigned a value of 1; while categories of 40-44 and 45-49 were combined and assigned the value of 2.

ii. The actual exclusion in SPSS involved the following steps;

● In the data menu, 'select case' was selected.

● Then the 'if' condition was selected.

● Then the variable 'age group variable' was selected.

● Then the variable was made is equal to 2; age group=2.

This deselected or excluded value 1 (which comprises of ages 15-39) and only included value 2 (which comprises of ages 40-49). Thus, all analyses only took into account ages 40-49.

2.3. Measurement of Variables

2.3.1. Dependent Variable

The outcome variable was Childbirth Ever Born (CEB). This is a typical measure of fertility (8, 18).

2.3.2. Independent Variables

Age at first cohabitation or marriage and age at first birth are the main explanatory variables. It should be noted that in Malawi, the legal age of marriage for women is currently 18 years. Nevertheless, the study included women who reported to have started cohabiting or giving birth for the first time between the ages of 15 and 18, as demographic data and practice suggest that there are many cohabitations and births in this age range. In addition, the law had just been passed, so it could not have affected the group of women who are now 40 to 49 years old (19). As a result, the age at first marriage or birth was divided into four categories including under 18 years, between 18 and 21 years, between 22 and 25 years, and 26 years and above. Those under 18 were assigned to a separate age group, taking into account the current legal age of marriage for women. The classification into the 18-to 21-year-old age group was based on the widespread assumption that girls of this age are more likely to graduate from secondary school, enter into a partnership, or have a child for the first time. The classification into 22-to 25-year-old age group was based on assumption that individuals are more likely to graduate from tertiary or higher education, enter into partnership, or have a first child for the first time during this age category.

Independent variables considered in this study included educational level of the woman and her partner, residence in an urban or rural area, ethnicity, religion, household economic status, marital status, and contraceptive use. After reviewing the literature, these variables were included as covariates in the analysis (7, 8, 11-13).

2.4. Statistical Analysis

Two statistical procedures, ANOVA and the Poisson regression model, were used to analyze the bivariate associations between each explanatory variable and the outcome variables. The mean number of children ever born in the cohort of women who began cohabiting or giving birth at different time points were compared with ANOVA to determine if there were significant differences. Because children ever born (CEB) is a quantitative dependent variable, this test was applied. As suggested by the researchers, the study used ANOVA and considered the assumptions of independence of observations, normal distribution, and homogeneity of variances (20). In addition, post-hoc analyzes were performed to compare the variable categories by pairing the variable groupings and determining which group differed from the other. All post-hoc tests related to equal variance were performed. Thus, Games-Howel, Temhane's T2, Dunnett's T3, and Dunnett's C were performed. The factors that were strongly associated with total number of children ever born were selected for regression modeling.

The main explanatory variables, covariates, and effects of outcome variables were assessed using Poisson regression models 1 and 2. Model 1 examined how each independent variable affected the outcome variable, whereas Model 2 (controlling for other independent factors) assessed the overall effect of each independent variable on the outcome variable. The Poisson distribution accounts for counts and discrete outcome variables (21). Because the values of the CEB were recorded as counts, this type of regression model is more appropriate.

In the following, the Poisson regression model is applied:

$$ln\ (CEB) = a + b1X1 + b2X2 + \ldots bnXn + e,$$

where X1, X2, and X3 are independent variables, b1, b2, and b3 are coefficients of the explanatory variables, CEB represents children ever born to a woman, a is a constant, and e is the error term.

To make the data more readable, the coefficients were exponentiated to obtain the incidence rate ratio (IRR). The incidence rate illustrates how a change in X (the independent variable) affects the incidence of Y (CEB) (22). Therefore, the incident rate ratio (IRR) with a 95% Wald confidence interval (WCI) was used to represent and explain the results of Poisson regression analysis (17, 18). Data analysis was performed with SPSS version 25 using the correct survey weights. Equality of variance was tested using the Akaike information criterion (AIC) and the Bayesian information criterion, taking into account the assumptions of the Poisson regression model (BIC). The AIC and BIC values were lower than those of the negative binomial models, so Poisson regression models are recommended in such cases (8).

3. Results

3.1. Characteristics of the Respondents

Inclusion criteria were used to achieve the aim of the study, which was to examine women aged 40 to 49 years. Of the original total of 24562 women aged 15 to 49 years interviewed in the DHS primary survey, 3583 women (women aged 40 to 49 years only) were subsampled. About one-third of respondents (33.3%) began cohabitation between the ages of 18 and 21; one in eight respondents (12.3%) began cohabitation between the ages of 22 and 25; one in thirteen respondents (7.9%) began cohabitation over the age of 26; and nearly half of respondents (46.6%) began cohabitation under the age of 18.

Regarding the age at first birth, roughly a third of the respondents (34.4%) began having children when they were under the age of 18, roughly half of the respondents (43.0%) when they were between the ages of 18 and 21, about a sixth of the respondents (15.4%) when they were

Table 1: Sample characteristics of women aged 40-49 years at the time of survey, 2015-16 MDHS (N=3583)

Variable	**N**	**%**
Age at first cohabitation		
Aged less than 18 years	1651	46.6
Aged 18-21 years	1180	33.3
Aged 22-25 years	435	12.3
Aged 26 years and above	279	7.9
Age at first birth		
Aged less than 18 years	1216	34.4
Aged 18-21 years	1519	43.0
Aged 22-25 years	445	15.4
Aged 26 years and above	254	7.2
Use of modern contraceptives		
Using	1716	47.9
Not using	1867	52.1
Religion		
Christian	3186	89.6
Muslim	368	10.4
Ethnicity		
Chewa	1058	30.7
Tumbuka	371	10.8
Lomwe	636	18.5
onga	144	4.2
Yao	373	10.8
Sena	180	5.2
Nkhonde	45	1.3
Ngoni	448	13.0
Mang'anja	98	2.8
Nyanga	91	2.6
Type of place of residence		
Urban	634	17.7
Rural	2949	82.3
Highest education level		
No education	1093	30.5
Primary	2057	57.4
Secondary	334	9.3
Higher	99	2.8
Household economic status		
Poor	1202	33.5
Middle income	1503	41.9
Rich	878	24.5
Partner's level of education		
No education	399	15.2
Primary	1640	62.4
Secondary	441	16.8
Higher	150	5.7
Cohabiting status		
Yes	2669	75.3
No	876	24.7

between the ages of 22 and 25, and one out of every fourteen respondents (7.2%) when they were over the age of 26, according to the survey. The details of covariates are also shown in Table 1.

3.2. Association between Women's Autonomy and Fertility: Bivariate Analysis

The results of the bivariate associations between each dependent variable and each independent

Table 2: Bivariate analysis (based on ANOVA) of the association between age at first cohabitation or birth including other covariates and completed fertility

Variable	Mean	95% CI	SD	F score	P value
Age at first cohabitation					
Aged less than 18 years	6.47	6.36-6.59	2.67	107.88	<0.001
Aged 18-21 years	5.90	5.77-6.02	2.40		
Aged 22-25 years	4.71	4.51-4.91	1.31		
Aged 26 years and above	4.51	4.22-4.80	1.21		
Age at first birth					
Aged less than 18 years	6.68	6.55-6.81	2.68	167.41	<0.001
Aged 18-21 years	6.07	5.96-6.18	2.42		
Aged 22-25 years	5.09	4.92-5.26	2.12		
Aged 26 years and above	3.69	3.46-3.92	0.86		
Use of modern contraceptives					
Using	6.25	6.15-6.34	2.43	79.03	<0.01
Not using	5.54	5.42-5.66	2.23		
Religion					
Christian	5.84	5.76-5.92	2.31	7.25	<0.05
Muslim	6.20	5.93-6.46	2.58		
Ethnicity					
Chewa	6.33	6.19-6.46	2.45	9.70	<0.01
Tumbuka	5.83	5.60-6.05	2.25		
Lomwe	5.47	5.27-5.68	2.32		
Tonga	4.97	4.59-5.35	2.07		
Yao	5.92	5.65-6.18	2.38		
Sena	5.98	5.64-6.31	2.41		
Nkhonde	5.02	4.31-5.74	2.06		
Ngoni	5.85	5.64-6.07	2.48		
Mang'anja	5.81	5.33-6.28	2.44		
Nyanga	5.35	4.92-5.78	2.17		
Type of place of residence					
Urban	4.69	4.52-4.85	2.02	198.55	<0.01
Rural	6.13	6.05-6.22	2.45		
Highest education level					
No education	6.38	6.24-6.53	2.51	124.30	<0.01
Primary	6.01	5.91-6.11	2.44		
Secondary	4.23	4.02-4.44	1.81		
Higher	3.13	2.83-3.42	0.26		
Household economic status					
Poor	6.34	6.21-6.47	2.49	108.55	<0.01
Middle income	6.09	5.97-6.21	2.45		
Rich	4.88	4.74-5.03	1.93		
Partner's level of education					
No education	6.51	6.27-6.74	2.60	64.16	<0.01
Primary	6.39	6.28-6.50	2.52		
Secondary	5.23	5.03-5.43	2.07		
Higher	4.34	4.02-4.66	1.91		
Cohabiting status					
Yes	6.09	6.00-6.18	2.46	61.85	<0.01
No	5.36	5.21-5.52	2.18		

Statistically significant at P<0.05, where SD is standard deviation and CI is confidence interval of the mean.

variable are shown in Table 2. The average number of children ever born was significantly associated (P=0.001) with the respondent's age at first cohabitation. The average scores, standard deviations, and 95% confidence intervals for the number of children ever born for each age group are as follows: births under the age of 18 (mean=6.47, SD=4.67, 95% CI=6.36-6.59), births between the ages of 18 and 21 (mean=5.90, SD=4.40, 95% CI=5.77-6.02), births between the ages of 22 and 25 (mean=4.71, SD=3.31, 95% CI=4.22-4.80). Except respondents aged 26 and above, the Post-hoc comparison tests revealed that the mean scores among each of these groups varied significantly. The average number of children ever born also showed a significant association (P=0.001) with the age at first birth. For each age group, the average scores, standard deviations, and confidence intervals for the number of children ever born are as follows: aged under 18 (mean: 6.68, SD: 4.68, 95% CI: 6.55-6.81), aged between 18 and 21 (mean: 6.07, SD: 4.42, 95% CI: 5.96-6.18), aged between 22 and 25 (mean: 5.09, SD: 4.12, 95% CI: 4.92-5.26), and aged over 26 (mean: 3.69, SD: 2.86, 95% CI: 3.46-4.92). The results of the post-hoc comparison tests showed that the means of each of these groups were significantly different. The results of both variables revealed a diminishing pattern; therefore, there was a decline in the number of children ever born with an increase in the age of first cohabitation or first birth. In contrast, it was discovered that the number of children ever born was significantly associated with the use of modern contraceptives, religion, ethnicity, type of residence (rural or urban), respondent's education level, household financial status, partner's education level, and cohabiting status.

3.3. Determinants of Children Ever Born: A Poisson Regression Analysis

The Poisson regression models' findings, which are incidence rate ratios of various explanatory factors for the total number of children ever born among women aged 40–49 at the time of the survey, are displayed in Table 3.

The primary explanatory factors, according to unadjusted model 1, were associated with number of children ever born. The respondents who began cohabiting at or after the age of 26 were used as a reference group; those who began cohabiting before the age of 18 (UIRR=1.44, CI 1.35-1.52) and between the ages of 18 and 21 (UIRR=1.31, CI=1.23-1.39) were likely to have given births to higher number of children upon the completion of their fertility. However, there was no discernible difference between the reference group and those who began cohabiting or got married between the ages of 22 and 25. According to the previously mentioned reference category, women who began having children before the age of 18 (UIRR=1.81, CI 1.69-1.94), between the ages of 18 and 21 (UIRR=1.65, CI=1.54-1.76), and between the ages of 22 and 25 (UIRR=1.38, CI=1.28-1.49) were likely to have given births to higher number of children ever born upon the completion of their fertility.

The Incidence Rate Ratios (IRRs) for Model 2 displayed the net effects of each explanatory variable. Comparing to respondents in the reference group, individuals who began cohabiting before the age of 18 (AIRR=1.09, CI=1.01-1.18) and between the ages of 18 and 21 (AIRR=1.09, CI=1.01-1.18) were likely to have given birth to higher number of children upon the completion of their fertility. However, there was no discernible difference between the reference group and those who began cohabiting between the ages of 22 and 25. Regarding age at first birth, it was discovered that respondents who began having children younger than 18 years old (AIRR=1.61, CI 1.47-1.76), between 18 and 21 years old (AIRR=1.48, CI=1.36-1.62), and between 22 and 25 years old (AIRR=1.32, CI=1.20-1.44) were likely to have given births to higher number of children upon the completion of their fertility than respondents in the reference group.

The number of children ever born was also significantly influenced by other factors, including the woman's place of residence (rural or urban), woman's educational level, partner's educational level, household income status, and use of modern contraceptives. Having no education (AIRR=1.42, CI=1.21-1.67), primary education (AIRR=1.38, CI=1.18-1.61), or secondary education (AIRR=1.20, CI=1.02-1.40); having a partner with no education (AIRR=1.10, CI=1.00-1.11) or with primary education (AIRR=1.11, CI=1.00-1.22); poor household status (AIRR=1.09, CI=1.03-1.16) or middle-income household status (AIRR=1.06, CI=1.01-1.12); urban residency (IRR=0.90); and modern contraceptives (AIRR=1.06, CI=1.03-1.10) show substantial association with number of children ever born. Other explanatory factors including ethnicity, religion, and cohabitation

Table 3: The incidence rate ratio of age at first cohabitation or birth and other explanatory variables predicting the likelihood of completed fertility

Variables	Fertility (Children ever born)			
	Unadjusted (Model 1)		Adjusted (Model 2)	
	UIRR	95% C.I.	AIRR	95% C.I.
Age at first cohabitation				
Aged less than 18 years	1.44***	1.35-1.52	1.09***	1.01-1.18
Aged 18-21 years	1.31***	1.23-1.39	1.09***	1.01-1.18
Aged 22-25 years	1.04	0.97-1.12	1.04	0.95-1.14
Aged 26 years and above	1.00		1.00	
Age at first birth				
Aged less than 18 years	1.81***	1.69-1.94	1.61***	1.47-1.76
Aged 18-21 years	1.65***	1.54-1.76	1.48***	1.36-1.62
Aged 22-25 years	1.38***	1.28-1.49	1.32***	1.20-1.44
Aged 26 years and above	1.00		1.00	
Use of modern Contraceptives				
Using			1.06***	1.03-1.10
Not using			1.00	
Religion				
Christian			1.00	0.94-1.07
Muslim			1.00	
Ethnicity				
Chewa			1.06	0.93-1.20
Tumbuka			1.06	0.93-1.21
Lomwe			0.95	0.84-1.08
Tonga			0.91	0.78-1.05
Yao			1.02	0.89-1.78
Sena			1.04	0.91-1.20
Nkhonde			1.03	0.83-1.27
Ngoni			1.04	0.91-1.18
Mang'anja			1.00	0.85-1.16
Nyanga			1.00	
Type of place if residence				
Urban			0.90***	0.86-0.96
Rural			1.00	
Highest education level				
No education			1.42***	1.21-1.67
Primary			1.38***	1.18-1.61
Secondary			1.20***	1.02-1.40
Higher			1.00	
Household economic status				
Poor			1.09***	1.03-1.16
Middle income			1.06***	1.01-1.12
Rich			1.00	
Partner's level of education				
No education			1.10***	1.00-1.22
Primary			1.11***	1.00-1.22
Secondary			1.02	0.92-1.12
Higher			1.00	
Cohabiting status				
Yes			0.95	0.91-1.02
No			1.00	

***Statistically significant at P<0.05, UIRR: Unadjusted Incidence Rate Ratios, AIRR: Adjusted Incidence Rate Ratios status at the time of the survey were found to have no substantial association with completed fertility and number of children ever born.

Figure 2 replicates figure 1's conceptual framework but with inclusion of not only variables but also their respective regression coefficients. Like Figure 1, Figure 2 also shows pathway through which the main independent variables affect the cohort's completed fertility.

4. Discussion

The results of this study showed that, like with period fertility, age at the first cohabitation or birth is associated with completed fertility. Thus, there is no substantial difference between period fertility and completed fertility, despite period fertility being reported to be associated with tempo effect. The results concur with those reported by the studies focusing on period fertility (7, 8), suggesting that delay in cohabiting or giving birth is associated with fewer number of children ever born and vice-versa. This also concurs with the findings by Sobotka (23), according to whom the recuperation of perceived postponement of births due to delay in cohabiting or giving birth, even if it may happen, would still not have substantial effect; thus, the tempo effect is likely to have negligible effects.

The data here also point to important moderators of the link, such as the woman's place of residence (rural versus urban), her educational attainment, her partner's educational attainment, her usage of contemporary contraceptives, and

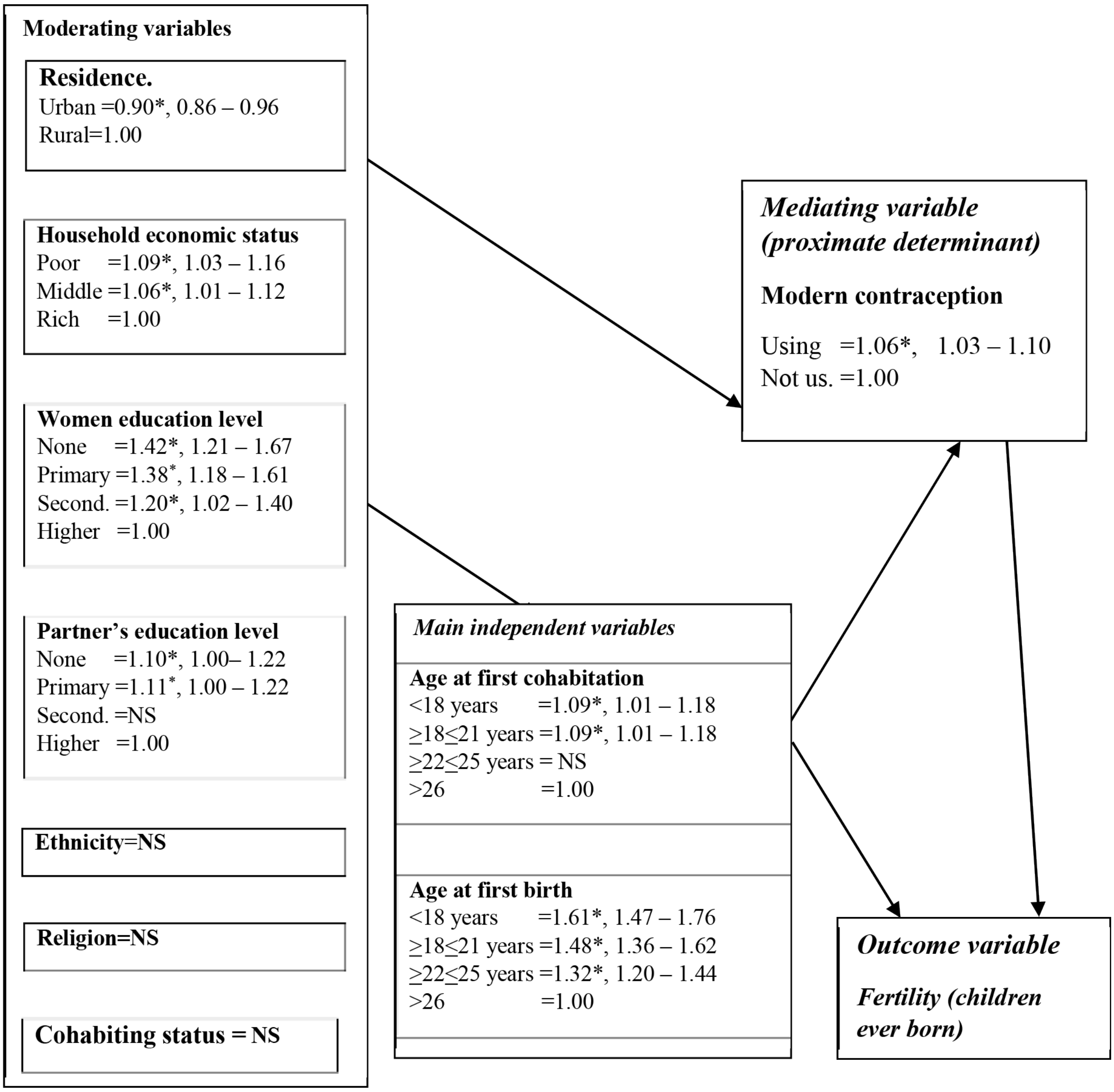

Figure 2: The figure shows the conceptual framework, indicating variables and their respective regression coefficients of possible mechanisms through which age at first cohabitation or birth impact upon cohort's completed fertility.

the economic standing of the household. In Malawi, these factors have regularly been found to be linked to (period) fertility (3, 7, 8, 24). The results may be explained by the expensive life in urban regions, particularly in housing and everyday expenditures that are money-centric; as a result, most households are likely to have fewer children ever born. Additionally, urban regions have better access to medical facilities including more reproductive health access. Furthermore, women who spend longer in school are also more likely to start dating or having children later in life. Consequently, they have a shorter gestational period. In addition, women with higher levels of education have a tendency to hold formal jobs. Formal jobs are rewarding but they demand a lot of women's time, making them to give birth to a few numbers of children. Educated women are also knowledgeable about reproductive health issues. A trend of having more children could be observed in households with relatively low economic status. A possible explanation could be that households with low-income status view having more children as a source of labor (especially for farming), and a form of insurance for their future help thus, in case some of the children die prior to the parents, some would still live since there are many and help the parents at their old age.

The findings also indicated that women who used contemporary contraceptives were likely to give birth to more children overall. Although it is unexpected results, it is consistent with those found in India based on period fertility, showing that women who had more children were likely using contraceptives (25). The possible explanation could be that they may already have attained their desired number of children if they belong to the cohort of women who have completed or are about to complete their lifetime childbearing. Therefore, if they have not yet reached menopause, they are more likely to use contemporary contraception to prevent getting pregnant. On the other hand, women with fewer number of children tend to take contemporary contraceptives less frequently, perhaps because they still desire to have children.

4.1. Limitations

Self-reporting was used to collect the data, which could have affected the findings due to social desirability or recollection issues. However, the aforementioned issues might have been resolved by the use of ANOVA, which displays both the mean and confidence interval (within which the mean falls). Another drawback is that the study sample, which consisted of women aged 40 to 49. Even though the DHS MEASURE advises the using of women between the ages 40 and 49 as a proxy for women who have finished giving births to children, some of these women may still be able to reproduce. The use of DHS secondary current data itself is another restriction. The employed control variables were unable to provide further data, particularly when it came to longitudinal experiences as the control variables only reflect respondents' experiences in the time leading up to the survey; nevertheless, the variables are still relevant.

5. Conclusions

The results of this study showed that, similar to period fertility, age at the first cohabitation or birth have substantial impact on completed fertility. Thus, period fertility irrespective of its association with tempo effect, may not differ much from the finished fertility. The validity of the use of period fertility in determining completed fertility is suggested by this finding. According to the findings, modern contraceptive use may mediate the relationship between age at first cohabitation or birth and lifetime fertility, whereas education, household economic status, and urban or rural residency may moderate the relationship. Increased education support is recommended, in light of Malawi's rising levels of poverty, in order to educate as many girls as possible. This study also recommends that education support should be extended to a boy child, as he will eventually collaborate with female partner in making decisions about fertility. The government and development partners should be committed to eradicating poverty in Malawi, and should work to raise family income levels because research shows that an increase in household's income status is associated with a few numbers of children born ever. The study strongly advises that Malawians of reproductive ages should continue to use contemporary contraception.

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