Introduction

Marriage age which also refers to age at first marriage (Dommaraju, 2008) is an important proximate determinant of fertility (Bongaarts, 1978) and indeed has not only been linked with demographic change in many parts of Europe and North America where fertility has stabilized at low levels, but has also been identified as one of the causes of high fertility level in developing countries of Africa and Asia where the practice of early marriage remain widespread (Clifton & Frost, 2011; Garenne, 2004; Guilbert, 2013; Haloi, 2014; Head, Zweimueller, Marchena, & Hoel, 2014; Kyari & Ayodele, 2014). Though childbearing outside marital unions is prevalent worldwide, the greatest proportions of childbearing occur within marital unions (Acharya, 2010). The recognition of this fact has often been the basis for devising initiatives to encourage rise in age at first marriage as one of the means of redressing high fertility in many developing countries (World Health Organization [WHO], 2011). Evidence abounds that populations with higher age at first marriage have on the average low fertility level (Dommaraju, 2008; Sathar & Kiani, 1998). This is made possible by higher ability to exercise more control over reproductive decisions including decisions about childbearing, improved educational attainment, and enhanced economic capacities of populations that delay first marriage (Population Reference Bureau [PRB], 2007).

Following the rise to prominence of gender equality and women’s empowerment in global population and health discourses after the 1994 Cairo International Conference on Population and Development, initiatives to raise age at first marriage has been linked with agitations for improvement in women’s empowerment (UNICEF, 2005). Women’s empowerment refers to the process of providing women with greater access to vital resources such as education, employment, and health care for the purpose of increasing their ability to control their own affairs and to reduce women’s domination by men. It is widely believed that by delaying marriage, several hundreds of thousands of young girls will acquire improved education which will make them to understand and demand for basic human rights and participation in the workforce (USAID, 2012), thus likely to cause change in their fertility desire and ultimately their fertility behavior. There is therefore a nexus among age at first marriage, fertility behavior, and women’s empowerment. However, in spite of several studies focusing on women’s empowerment and fertility-related issues (Acharya, 2010; Raj, Saggurti, Balaiah, & Silverman, 2009; Riyami, 2003; Salam, 2013; Sivasankaran, 2014; Upadhyay & Karasek, 2010; Upadhyay et al., 2014; Wado, 2013) insufficient attempts have been made to simultaneously explore the relationship between age at first marriage and fertility behavior on the one hand and women’s empowerment on the other hand. This study tries to fill this gap by exploring whether age at first marriage is related to fertility behavior and women’s empowerment. It is important

Abstract

This study examines the relationship between age at first marriage and women’s fertility behavior and empowerment. Data were extracted from the 2013 Nigeria Demographic and Health Survey. The Poisson regression and multinomial logistic regression were applied using Stata version 12. Results show that the incident rate of children ever born for women aged 15 to 19 years is less than the incident rate of children ever born for women aged 14 years or less (incident rate ratios = 0.8177, p < .01), and that the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 2.0988 for those aged 15 to 19 years at first marriage compared with those aged 14 years or less. Age at first marriage is significantly related to women’s fertility behavior and empowerment.

Keywords
health care, pregnancy termination, mass media, wealth index, age at marriage
to examine the interrelatedness of age at first marriage, fertility behavior, and women’s empowerment in Nigeria because in spite of being the most populous country in Africa, implementation of population and gender policies (such as the 2004 National Population Policy for Sustainable Development and 2006 National Gender Policy) are yet to achieve significant fertility reduction and improvement in women’s empowerment in the country. The specific objectives of the study are to describe the patterns of age at first marriage, fertility behavior, and women empowerment by the geo-political zones in Nigeria; and examine the relationship between age at first marriage and fertility behavior. In addition, the study examines the relationship between age at first marriage and women’s empowerment in Nigeria.

Theoretical Framework

Liberal feminist theory provides the theoretical underpinning of the current study. Liberal feminism aims at improving all round gender equality and empowerment by encouraging women’s access to public institutions and bringing women’s issues to the fore of national discourse (Walter, 1998). These are to be achieved through educational reforms and enactment of appropriate legislations not only to bridge the state of inequality between men and women, but to also change community norms and beliefs about early marriage as already been achieved in countries such as Cambodia, Nepal, and Rwanda (Head et al., 2014). In Nigeria, women and girls have unequal economic, social, and political opportunities with men in the country (British Council, 2012). This is made possible and sustained by Nigeria’s socio-cultural system that not only promotes women’s subordinate position, but also sustains inequality in decision-making positions in government (Omoluabi, Aina, & Attanasso, 2014). In addition, several harmful practices including gender-based violence, female genital cutting, early and forced marriages, widow inheritance, and so on, are common in the country (National Population Commission [NPC], 2004). However, in the last two decades, national attention to the plight of women has steadily increased in the country. Numerous gender activists, civil society groups, and women-centered organizations have not only stepped up advocacy for women’s rights, they have also established a National Coalition on Affirmative Action (NCAA) to champion agitation for the domestication of United Nation’s Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW). The government of Nigeria has positively responded to the agitations by adhering to the Beijing Platform of Action that demands that women fill at least 35% of all political posts (NPC and ICF Macro, 2009). Though, achieving this target for elective positions in the country seems to be unattainable in the present dispensation, the social position of women in the country is likely to improve steadily with sustained education for young girls and women.

Method

Data Sources

The data for this study were extracted from the 2013 Nigeria Demographic and Health Survey (NDHS). The 2013 NDHS is the fifth Demographic and Health Survey implemented in the country. It is a nationally representative survey that provides valid information on basic demographic and health indices such as fertility, marriage, family planning, adult and childhood mortality, domestic violence, and HIV/AIDS (NPC and ICF International, 2014). The data were accessed online through the website of MEASURE DHS following the submission of abstract giving details of the study objective. We analyzed the women data set focusing on a weighted sample size of 19,397 women having excluded women who were never married (9,820 women), women who have never had a live birth (9,474 women), and women who were widowed, divorced, and separated (1,854 women).

Variable Description and Measures

The outcome variables in the study are fertility behavior and women’s empowerment. Fertility behavior was measured by children ever born, current contraceptive use, pregnancy termination, and desire for more children. However, only children ever born were used to proxy fertility behavior at the bivariate and multivariate levels of statistical analyses. This was done because children ever born has been widely used as a measure of fertility behavior (Acharya, 2010; Sathar & Kiani, 1998). Women’s empowerment was measured in the study using level of women’s autonomy and education. Women’s autonomy was derived from responses to questions on control of household decisions, namely who has the final say on own health care, purchase of large items, and visit to friends and relatives? Responses to these questions were coded in the NDHS as follows: respondents alone, respondents and husband, husband alone, someone else, and others. Dummy variables for each of these response domains were created by categorizing the responses into three, namely low, moderate, and high autonomy. The three categories used in the study differs from the two categories usually found in DHS studies (Kishor & Subaiya, 2008; Upadhyay & Karasek, 2010; Wado, 2013) to reflect increasing singlehood among women in Nigeria (Chizomam & Isiugo-Abanihe, 2014).

For each domain, the variable is coded 1 if respondents have no say in the decision, 2 if respondent jointly take decision with husband/partner, and 3 if respondent take decision alone. Women’s educational attainment was equally categorized into three groups, namely, low, moderate, and high. Respondents who attained none and primary education were categorized as having “low education,” those who attained secondary education as having “moderate education,” and those who attained higher education as having “high education.” A composite indicator of women empowerment was
then generated by combining level of autonomy and education. This indicator was categorized into low, moderate, and high empowerment: women who report low autonomy and low education indicating low empowerment, women who report moderate autonomy and education indicating moderate empowerment, and high autonomy and education indicating high empowerment.

The key explanatory variable is age at first marriage grouped into four age intervals of 14 years or less, 15 to 19 years, 20 to 24 years, and 25 years and above. Other explanatory variables include selected socio-economic characteristics (wealth quintile, place of residence, employment status, religious affiliation and region). The relationships between the explanatory and outcome variables were mediated by barriers to health care and access to mass media. Health care is an important resource for empowerment with women experiencing barriers to timely and appropriate health care having less likelihood of empowerment (Head et al., 2014). Barriers to health care were generated by combining women’s responses on whether money, distance, and husband permission constitute hindrance to health care. Access to mass media was generated using the frequency of reading newspaper, listening to radio, and watching television. Women who did not read newspapers, listened to radio, or watch television indicated women with “no” access to mass media. Women who read newspaper, listen to radio, or watch television less than once a week indicated women with “low” access to mass media, whereas those whose frequency of reading newspaper, listening to radio, or watching television was at least once a week indicated women with “moderate” access to mass media.

Data Analysis

Stata version 12 was used to perform statistical analyses which commenced after applying standardized sample weights (StatCorp, 2009). Frequency table was used to describe sample characteristics, patterns of marriage age, fertility behavior, and women’s empowerment across the geo-political zones of the country. Two multivariate techniques were used to examine the relationship between the research variables. The justification for this relates to the different nature of the outcome variables. The Poisson regression was performed to examine the relationship between age at first marriage and children ever born. The Poisson regression is particularly suitable for regressing dependent variable on independent variables when the dependent variable is a non-negative count variable (StatCorp, 2009) such as children ever born used to proxy fertility behavior in the current study. Results of the Poisson regression are presented in the study as the incident rate ratios (IRR) which estimate the incidence of children ever born in a given category relative to the reference category. The Poisson regression was replicated in three models. Model 1 included only age at first marriage. Model 2 controls for the socio-economic factors whereas Model 3 controls for the mediating factors. Models 2 and 3 were constructed to determine whether inclusion of other variables in the model will alter the relationship between age at first marriage and children ever born.

The multinomial logistic regression was performed to examine the relationship between age at first marriage and empowerment. The multinomial logistic regression is not only appropriate for analysis in the current study because it is mainly applicable to the analysis of discrete dependent variables when the dependent variable has more than two nominal or unordered categories (Bayaga, 2010; StatCorp, 2009), it is also increasingly being used in the analysis of social issues (El-Habil, 2012; Peng & Nichols, 2003). In the current study, the multinomial logistic regression was replicated in three models with moderate empowerment as base outcome. Model 1 included only age at first marriage, Model 2 controls for the mediating factors, whereas Model 3 controls for the socio-economic factors. The relative risk ratios (RRR) are used in the study to report the estimated coefficients of the multinomial model. This measures the risk of low or high empowerment relative to moderate empowerment.

Results

This section presented results that were generated from the study. Table 1 presents description of sample characteristics. More than one fifth of the women were either in the “poorest” or “poorer” ladder of the wealth groups. The distributions of women in other wealth categories were nearly equal. For instance, the same proportions of women were in the “richer” and “richest” categories. The highest proportions of the women reside in rural areas while slightly more than one third of the women reside in urban areas. More than two thirds of the women were currently employed, whereas less than one third of them were unemployed. Muslim women were dominant among the respondents. More than one third of the respondents were Christians, whereas an insignificant proportion was adherents of traditional or other faiths. The highest proportion of the women did not report any barrier to health care. However, slightly less than one tenth of the women had at least one barrier to accessing health care. About one third of the women had no access to mass media; slightly more than one fifth had low access to mass media, whereas nearly half of the women had moderate access to mass media. Women in the north-west zone of the country were dominant in the sample. The three zones in the northern region constitute more than two thirds of the sample compared with less than one third in the three southern zones of the country.

Table 2 presents result of patterns of marriage age, fertility behavior, and women’s empowerment across the geo-political zones in the country. Slightly more than a quarter of the women married at age 14 years or less with highest proportion of early marriages occurring in the north-western zone of the country. However, the dominant age interval at
first marriage across the country is 15 to 19 years. The proportions of first marriages occurring at 25 years or above were higher in the southern region and lowest in the northern region. The mean number of children ever born was highest in the north-western zone compared with other zones in the country.

As indicated in Table 2, contraceptive use among married women is poor in Nigeria. Only 15.7% of the respondents were currently using at least one method of modern contraception; however, use of modern contraceptives were much better in the three southern zones compared with its prevalence in northern zone. Pregnancy termination experiences were more prevalent in southern region particularly in the south-eastern and south-western zones, which incidentally are the two zones with higher contraceptive prevalence. Desire for more children were higher in north-eastern and south-eastern zones, which incidentally were more prevalent in southern region particularly in the south-central zone. Pregnancy termination experiences were best in the three southern zones compared with other zones in the country. Result of levels of empowerment provide evidence of low level of women’s empowerment particularly in northern parts of the country. The highest level of empowerment was found in south-western zone compared with the lowest level of empowerment in the north-western zone.

Table 3 presents result of Poisson regression. In the three models constructed, age at first marriage is significantly related to children ever born. In Model 1, the incident rate of children ever born for women aged 15 to 19 years at first marriage is less than the incident rate of children ever born for women aged 14 years or less (irr = 0.8177, p < .01). Likewise, the incident rate of children ever born for women aged 20 to 24 years is less than the incident rate of children ever born for the reference group holding the other variables constant (irr = 0.6855, p < .01). When the socio-economic factors were included in Model 2, age at first marriage remains significantly related to children ever born. The incident rate of children ever born reduces consistently as age at first marriage increases from the reference category to higher ages given the other variables are held constant in the model. In the model, the incident rate of children ever born reduces consistently as household wealth index improves from the reference category to other wealth groups. For instance, the incident rate of children ever born among women in the middle wealth group is less than the incident rate of children ever born among women in the reference category (irr = 0.8994, p < .01). Likewise, the incident rate of children ever born among unemployed women increases compared with the incident rate of children ever born among employed women (irr = 1.275, p < .01) holding the other variables constant.

When the mediating factors were included in Model 3 while controlling for the socio-economic factors, age at first marriage remain associated with children ever born. In the model, the incident rates of children ever born were less for women with higher age at first marriage compared with the reference category. Also, the incident rate of children ever born reduces for women with low and moderate access to mass media compared with the incident rate of children ever born among women with no access to mass media.

Table 4 presents result of the multinomial logistic regression. In the three models constructed, age at first marriage shows significant relationship with empowerment. In Model 1, the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 2.0988 for those aged 15 to 19 years at first marriage compared with those aged 14 years or less. When age at first marriage increased to 20 to 24 years, the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 6.5759. Likewise, the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 17.5017 for those aged 25 years and above compared with those aged 14 years or less. The inclusion of socio-economic characteristics of respondents in Model 2 did not change the nature of the relationship between age at first marriage and empowerment.

### Table 1. Sample Characteristics.

| Characteristic          | Number of women | Percent |
|-------------------------|-----------------|---------|
| Wealth index            |                 |         |
| Poorest                 | 4,603           | 23.7    |
| Poorer                  | 4,354           | 22.4    |
| Middle                  | 3,552           | 18.3    |
| Richer                  | 3,443           | 17.8    |
| Richest                 | 3,445           | 17.8    |
| Place of residence      |                 |         |
| Urban                   | 6,830           | 35.2    |
| Rural                   | 12,567          | 64.8    |
| Employment status       |                 |         |
| Unemployed              | 6,086           | 31.4    |
| Employed                | 13,311          | 68.6    |
| Religious affiliation   |                 |         |
| Christianity            | 6,911           | 35.6    |
| Islam                   | 12,176          | 62.8    |
| Traditional/others      | 310             | 1.6     |
| Access to mass media    |                 |         |
| No access               | 6,423           | 33.1    |
| Low access              | 4,416           | 22.7    |
| Moderate access         | 8,558           | 44.1    |
| Access to health care   |                 |         |
| At least one barrier    | 1,606           | 8.3     |
| No barrier              | 17,791          | 91.7    |
| Region                  |                 |         |
| North-central           | 2,770           | 14.3    |
| North-east              | 3,308           | 17.0    |
| North-west              | 7,271           | 37.5    |
| South-east              | 1,506           | 7.8     |
| South-south             | 1,717           | 8.8     |
| South-west              | 2,825           | 14.6    |
| Total                   | 19,397          | 100.0   |

Source: Author’s analysis based on 2013 Nigeria Demographic and Health Survey Data.

In the three models constructed, age at first marriage is significantly related to children ever born. In Model 1, the incident rate of children ever born for women aged 15 to 19 years at first marriage is less than the incident rate of children ever born for women aged 14 years or less (irr = 0.8177, p < .01). Likewise, the incident rate of children ever born for women aged 20 to 24 years is less than the incident rate of children ever born for the reference group holding the other variables constant (irr = 0.6855, p < .01). When the socio-economic factors were included in Model 2, age at first marriage remains significantly related to children ever born. The incident rate of children ever born reduces consistently as age at first marriage increases from the reference category to higher ages given the other variables are held constant in the model. In the model, the incident rate of children ever born reduces consistently as household wealth index improves from the reference category to other wealth groups. For instance, the incident rate of children ever born among women in the middle wealth group is less than the incident rate of children ever born among women in the reference category (irr = 0.8994, p < .01). Likewise, the incident rate of children ever born among unemployed women increases compared with the incident rate of children ever born among employed women (irr = 1.275, p < .01) holding the other variables constant.

When the mediating factors were included in Model 3 while controlling for the socio-economic factors, age at first marriage remain associated with children ever born. In the model, the incident rates of children ever born were less for women with higher age at first marriage compared with the reference category. Also, the incident rate of children ever born reduces for women with low and moderate access to mass media compared with the incident rate of children ever born among women with no access to mass media.
The relative risk of being in high empowerment category instead of moderate category will increase by a factor of 1.8374 for those aged 20 to 24 years at first marriage compared with those aged 14 years or less. When age at first marriage increased to 25 years and above, the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 3.4416. All the selected socio-economic characteristics were associated with empowerment. For instance, while the relative risk of being in high empowerment category instead of moderate empowerment will increase by a factor of 1.6553 for urban women compared with rural women, the relative risk of being in high empowerment category instead of moderate empowerment will reduce by a factor of 0.9841 for unemployed women compared with employed women.

In Model 3, barriers to health care are the only variable not significantly related to empowerment. In the model, the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 1.8037 for those aged 15 to 19 years at first marriage compared with those aged 14 years or less. When age at first marriage increased to 25 years and above, the relative risk of being in high empowerment category instead of moderate category will increase by a factor of 11.5911. Also, the relative risk of

Table 2. Patterns of Marriage Age, Fertility Behavior, and Women’s Empowerment by Geo-Political Zone, Nigeria, 2013 (Percentage Distribution and Mean Number of Children Ever Born).

| Variable          | North-central | North-east | North-west | South-east | South-south | South-west | Total  |
|-------------------|---------------|------------|------------|------------|-------------|------------|--------|
|                   | (n = 2,770)   | (n = 3,308) | (n = 7,271) | (n = 1,506) | (n = 1,717) | (n = 2,825) | (N = 19,397) |
| Age at first marriage |               |            |            |            |             |            |        |
| <14 years         | 14.9          | 34.0       | 44.9       | 6.7        | 8.9         | 5.5        | 26.9   |
| 15-19 years       | 52.1          | 52.1       | 47.2       | 33.4       | 41.5        | 34.3       | 45.3   |
| 20-24 years       | 24.6          | 11.6       | 6.4        | 38.3       | 31.4        | 38.7       | 19.3   |
| 25 and above      | 8.4           | 2.3        | 1.5        | 21.6       | 18.2        | 21.5       | 8.5    |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |
| Fertility behavior |               |            |            |            |             |            |        |
| Mean CEB          | 3.6           | 4.6        | 4.7        | 4.0        | 3.9         | 3.4        | 4.2    |
| Contraceptive use |               |            |            |            |             |            |        |
| Not using         | 83.8          | 96.7       | 95.6       | 67.0       | 67.7        | 60.2       | 84.3   |
| Using             | 16.2          | 3.3        | 4.4        | 33.0       | 32.3        | 39.8       | 15.7   |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |
| Pregnancy termination |             |            |            |            |             |            |        |
| Ever              | 9.4           | 14.1       | 9.1        | 16.3       | 14.0        | 14.8       | 11.8   |
| Never             | 90.6          | 85.9       | 90.9       | 83.7       | 86.0        | 85.2       | 88.2   |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |
| Desire for more children |         |            |            |            |             |            |        |
| Wants no more     | 30.4          | 19.2       | 12.4       | 27.5       | 32.8        | 35.4       | 22.5   |
| Wants children    | 68.8          | 80.6       | 87.1       | 72.1       | 66.0        | 64.4       | 77.0   |
| Don’t know        | 0.8           | 0.2        | 0.5        | 0.4        | 1.2         | 0.2        | 0.5    |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |
| Level of autonomy |               |            |            |            |             |            |        |
| Low               | 49.8          | 59.9       | 75.4       | 20.5       | 18.7        | 9.8        | 50.3   |
| Moderate          | 36.9          | 37.2       | 21.9       | 56.7       | 60.2        | 63.7       | 38.8   |
| High              | 13.3          | 2.9        | 2.7        | 22.8       | 21.1        | 26.5       | 10.9   |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |
| Educational attainment |         |            |            |            |             |            |        |
| Low               | 66.7          | 85.2       | 88.8       | 32.9       | 35.0        | 36.6       | 68.3   |
| Moderate          | 25.8          | 11.9       | 10.0       | 55.5       | 52.3        | 47.8       | 25.4   |
| High              | 7.5           | 2.9        | 1.2        | 11.6       | 12.7        | 15.6       | 6.3    |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |
| Women’s empowerment |             |            |            |            |             |            |        |
| Low               | 59.8          | 64.0       | 78.2       | 51.4       | 47.6        | 38.4       | 62.5   |
| Moderate          | 20.5          | 30.3       | 17.9       | 15.8       | 20.3        | 23.0       | 21.2   |
| High              | 19.7          | 5.7        | 3.9        | 32.8       | 32.1        | 38.6       | 16.3   |
| Total             | 100.0         | 100.0      | 100.0      | 100.0      | 100.0       | 100.0      | 100.0  |

Source. Author’s Analysis based on 2013 Nigeria Demographic and Health Survey Data.
being in high empowerment category instead of moderate category will increase by a factor of 2.3881 for women with low access to mass media and by a factor of 4.1472 for women with moderate access to mass media compared with those with no access to mass media. In virtually all the three models constructed for low empowerment, the relationship between age at first marriage and empowerment was not statistically significant.

**Discussion**

This study explored the relationship between age at first marriage and fertility behavior on the one hand and between age at first marriage and women’s empowerment on the other hand. Four major findings emerged from our analyses. First, early marriage is dominant in northern Nigeria. This is consistent with the finding by Kyari and Ayodele (2014). Early marriage violates the rights of young girls to education and economic opportunities, but undermines their ability to advance socially and politically (USAID, 2012). The practice of early marriage thrives in the region for two basic reasons such as an accepted cultural practice in the region and parents and guardians of young girls derive economic gains from marrying young girls by receiving dowry payment or relief from paying school fees on the girl child (UNICEF, 2005). Both concerns must be fully addressed by social programs to change attitudes in the region. Governments in the region can develop programs that not only enforce universal basic education, but also provide economic incentives to parents and guardians who enrolled their female children in either primary or secondary school.

Second, there were differentials in fertility behavior among southern and northern women. On the one hand, women in north-eastern and north-western zones of the country had higher fertility compared with their southern counterparts. This results tends to support previous higher

| Table 3. Poisson Regression Showing the Incident Rate Ratios for Change in Children Ever Born Due to Change in Age at First Marriage and the Selected Factors. |
|---|---|---|---|
| **Variable** | **Model 1** | | | **Model 2** | | | **Model 3** | | |
| | **irr** | **p > |z|** | | **irr** | **p > |z|** | | **irr** | **p > |z|** |
| **Age at first marriage** | | | | | | | | | |
| <14 years (RC) | — | — | — | — | — | — | — | — | — |
| 15-19 years | 0.8177 .000 | | | 0.8477 .000 | | | 0.8270 .000 | | |
| 20-24 years | 0.6855 .000 | | | 0.7469 .000 | | | 0.7045 .000 | | |
| 25 years and above | 0.5668 .000 | | | 0.6413 .000 | | | 0.5869 .000 | | |
| **Socio-economic factors** | | | | | | | | | |
| Wealth index | | | | | | | | | |
| Poorest (RC) | — | — | — | — | — | — | — | — | — |
| Poorer | — | — | 0.9281 .000 | | — | — | — | — | — |
| Middle | — | — | 0.8994 .000 | | — | — | — | — | — |
| Richer | — | — | 0.8254 .000 | | — | — | — | — | — |
| Richest | — | — | 0.7189 .000 | | — | — | — | — | — |
| Place of residence | | | | | | | | | |
| Rural (RC) | — | — | — | — | — | — | — | — | — |
| Urban | — | — | 0.9425 .000 | | — | — | — | — | — |
| Religion | | | | | | | | | |
| Christianity (RC) | — | — | — | — | — | — | — | — | — |
| Islam | — | — | 1.0402 .000 | | — | — | — | — | — |
| Others | — | — | 1.1285 .000 | | — | — | — | — | — |
| Employment status | | | | | | | | | |
| Employed (RC) | — | — | — | — | — | — | — | — | — |
| Unemployed | — | — | 1.2753 .000 | | — | — | — | — | — |
| Mediating factors | | | | | | | | | |
| Barriers to health care | | | | | | | | | |
| Yes (RC) | — | — | — | — | — | — | — | — | — |
| No | — | — | — | — | 0.9780 .078 | — | — | — | — |
| Access to mass media | | | | | | | | | |
| No access (RC) | — | — | — | — | — | — | — | — | — |
| Low access | — | — | — | — | 0.9648 .000 | — | — | — | — |
| Moderate access | — | — | — | — | 0.9194 .000 | — | — | — | — |

Note. irr = incident rate ratios; RC = reference category.
fertility reported in northern Nigeria compared with the southern parts of the country (NPC and ICF Macro, 2009; NPC and ICF International, 2014). On the other hand, women in southern Nigeria had higher prevalence of modern contraceptive use than women in northern zone. It is however worrisome to note that in spite of higher prevalence of contraceptive use in southern Nigeria, higher proportions of women in the region have experienced pregnancy termination compared with their northern counterparts. This is worrisome because despite sustained advocacy for reform of the abortion law in Nigeria, pregnancy termination remained highly restricted under the Nigerian legal system (Oye-Adeniran, Long, & Adewole, 2004). Two reasons may account for the finding on pregnancy termination among the sampled women. On the one hand, it is plausible to reason that women in northern Nigeria are more interested in childbearing than southern women. This is shown in the result of desire for more children among the respondents. On the other hand, it is not certain whether women in southern Nigeria do not take pregnancy termination as a means of fertility control. Both possibilities suggest urgent need to scale up not only access to modern contraceptives in the country, but also devising more initiatives to boost its use among women in marital unions.

Third, significant relationship exists between age at first marriage and fertility behavior. Younger age at first marriage connotes early exposure to regular sexual intercourse which will ultimately translate into early childbearing in the absence of effective contraceptive (WHO, 2011). In consonance with findings in Sathar and Kiani (1998), Dommaraju (2008), Raj et al. (2009), Acharya (2010), and Haloi (2014) women who start childbearing early have on the long run more number of

| Variable               | High empowerment | Low empowerment |
|------------------------|------------------|-----------------|
|                       | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Age at first marriage  |         |         |         |         |         |         |
| <14 years (RC)         |         |         |         |         |         |         |
| 15-19 years            | 2.0988 .000 | 1.1752 .095 | 1.8037 .000 | 0.9229 .172 | 0.9386 .271 | 0.9318 .233 |
| 20-24 years            | 6.5759 .000 | 1.8374 .000 | 4.6885 .000 | 1.0530 .575 | 1.0557 .548 | 1.0598 .548 |
| 25 and above           | 17.5017 .000 | 3.4416 .000 | 11.5911 .000 | 1.2091 .156 | 1.1313 .343 | 1.2075 .171 |
| Socio-economic factors |         |         |         |         |         |         |
| Wealth index           |         |         |         |         |         |         |
| Poorest (RC)           |         |         |         |         |         |         |
| Poorer                 |         |         |         |         |         |         |
| Middle                 |         |         |         |         |         |         |
| Richer                 |         |         |         |         |         |         |
| Richest                |         |         |         |         |         |         |
| Place of residence     |         |         |         |         |         |         |
| Rural (RC)             |         |         |         |         |         |         |
| Urban                  |         |         |         |         |         |         |
| Religion               |         |         |         |         |         |         |
| Christianity (RC)      |         |         |         |         |         |         |
| Islam                  |         |         |         |         |         |         |
| Traditional and others |         |         |         |         |         |         |
| Employment status      |         |         |         |         |         |         |
| Employed (RC)          |         |         |         |         |         |         |
| Unemployed             |         |         |         |         |         |         |
| Mediating factors      |         |         |         |         |         |         |
| Barriers to health care|         |         |         |         |         |         |
| At least one barrier (RC) |         |         |         |         |         |         |
| No barrier             |         |         |         |         |         |         |
| Access to mass media   |         |         |         |         |         |         |
| No access (RC)         |         |         |         |         |         |         |
| Low access             |         |         |         |         |         |         |
| Moderate access        |         |         |         |         |         |         |

Note. rrr = relative risk ratios; RC = reference category.
children which may even extend beyond their desired level if they fail to use contraceptives or use it consistently. Fourth, significant relationship exists between age at first marriage and women’s empowerment with younger age at first marriage being associated with low level of empowerment. It is plausible to assume that women who delay marriage till older ages will have higher empowerment because in most cases most of the women delaying marriage were mostly attending educational institutions or actively engaged in the labor force. These findings indicate that significant change in fertility behavior as well as women’s empowerment can be achieved if age at first marriage is delayed.

In Nigeria, raising age at first marriage to at least 18 years for females was recognized in the 2004 National Population Policy as a strategy to improving the empowerment and reproductive health of girls and women; however, the strategy has not received meticulous commitment from the national legislatures due to cultural diversity in the country. Opposition to enactment of a minimum age at first marriage has remained stiff in northern Nigeria where early and sometimes forced marriages are more prevalent. As found in Kyari and Ayodele (2014), the prevalence of early marriage in northern Nigeria has serious socio-economic implications. Early marriage in the region denied many girls the opportunities of acquiring basic education and developing their talents. This is compounded by subsequent high fertility that further hinders their economic productivity and empowerment. It is therefore important that a nationwide program providing empirical evidence of the age at first marriage, fertility, and empowerment nexus should be designed and implemented in the country. This will go a long way in mobilizing for the enactment and enforcement of legislation to eliminate early marriage in the country.

With increasing women’s education and advocacy by women’s groups and in line with the assertion of Liberal feminists, a number of positive steps have been taken in the country to bridge gender gap and empower women in the country. One of such steps is the design and implementation of the 2006 National Gender Policy. The policy seeks to build a just society through promoting the realization of the full potentials of both men and women in the country (FMWA & SD, 2006). The policy has now been implemented for nearly a decade, but still far away from achieving set objectives. Though the policy sought to mainstream the principles of CEDAW into the country’s legal and administrative systems, no programs have been designed to build the capacity of legislatures to uphold a minimum age at marriage across the country.

**Conclusion**

This study concluded that age at first marriage has significant relationship with women’s fertility behavior and empowerment. The enactment and enforcement of legislation to eliminate early marriage will impact positively on fertility reduction and women’s empowerment in the country. Inference made in this study is limited by inability to establish a cause–effect relationship between age at first marriage and the outcome variables.

**Acknowledgments**

The author appreciates and thanks the National Population Commission (NPC) [Nigeria], ICF International, and MEASURE DHS Project for making the datasets available for use. The author is grateful to Dr. S. A. Adedini for his assistance on Poisson regression.

**Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding**

The author(s) received no financial support for the research and/or authorship of this article.

**References**

Acharya, A. K. (2010). The influence of female age at marriage on fertility and child loss in India. *Trayectorias, 12*(31), 61-80.

Baya, A. (2010). Multinomial logistic regression: Usage and application in risk analysis. *Journal of Applied Quantitative Methods, 5*, 288-297.

Bongaarts, J. (1978). A framework for analyzing the proximate determinants of fertility. *Population and Development, 4*, 105-131.

British Council. (2012). *Gender in Nigeria Report 2012 improving the lives of girls and women in Nigeria: Issues, policies and actions* (2nd ed.). Abuja, Nigeria: British Council.

Chizomam, N. L. F., & Isiugo-Abanihe, U. (2014). Determinants of singlehood: A retrospective account by older single women in Lagos, Nigeria. *African Population Studies, 27*(2 Suppl.), 386-397.

Clifton, D., & Frost, A. (2011). *World’s women and girls 2011 data sheet*. Washington, DC: Population Reference Bureau.

Dommaraju, P. (2008). *Marriage age and fertility dynamics* (DHS Working Papers No. 52). Calvert, MD: Macro International.

El-Habil, A. M. (2012). An application on Multinomial Logistic Regression Model. *Pakistan Journal of Operations Research, 8*(2), 271-291.

Federal Ministry of Women’s Affairs & Social Development. (2006). *National gender policy*. Abuja, Nigeria: FMWA & SD.

Garenne, M. (2004). Age at marriage and modernisation in Sub Saharan Africa. *Southern Africa Journal of Demography, 9*(2), 59-79.

Guilbert, N. (2013). Early marriage, women empowerment and child mortality: Married too young to be a “good mother”? (DOCUMENT DE TRAVAIL DT/2013-05). Retrieved from http://basepub.dauphine.fr/bitstream/handle/123456789/11404/DT%202013-05%20Guilbert.pdf?sequence=1

Haloi, A. (2014). Fertility differentials by incidence of marriage and their reproductive wastage in a Muslim population from rural North-East India. *Human Biology Review, 3*(1), 1-14.
Head, S. K., Zweimueller, S., Marchena, C., & Hoel, E. (2014). *Women’s lives and challenges: Equality and empowerment since 2000*. Rockville, MD: ICF International.

Kishor, S., & Subaiya, L. (2008). *Understanding women’s empowerment: A comparative analysis of Demographic and Health Surveys (DHS) data* (DHS Comparative Reports No. 20). Calverton, MD: Macro International.

Kyari, G. V., & Ayodele, J. (2014). The socio-economic effect of early marriage in North Western Nigeria. *Mediterranean Journal of Social Sciences, 5*, 582-592.

National Population Commission. (2004). *National policy on population for sustainable development*. Abuja, Nigeria: Author.

National Population Commission and ICF Macro. (2009). *Nigeria Demographic and Health Survey 2008*. Abuja, Nigeria: Author.

National Population Commission and ICF International. (2014). *Nigeria Demographic and Health Survey 2013*. Abuja, Nigeria and Rockville, MD: NPC and ICF International.

Omoluabi, E., Aina, O. I., & Attanasso, M. O. (2014). Gender in Nigeria’s development discourse: Relevance of gender statistics. *African Population Studies, 27*(2 Suppl.), 372-385.

Oye-Adeniran, B. A., Long, C. M., & Adewole, I. F. (2004). Advocacy for reform of the abortion law in Nigeria. *Reproductive Health Matters, 12*(24 Suppl.), 209-217.

Peng, C.-Y. J., & Nichols, R. N. (2003). Using multinomial logistic models to predict adolescent behavioural risk. *Journal of Modern Applied Statistical Methods, 2*, 1-13.

Population Reference Bureau. (2007). *2007 world population data sheet*. Washington, DC: PRB.

Raj, A., Saggurti, N., Balaih, D., & Silverman, J. G. (2009). Prevalence of child marriage and its effect on fertility and fertility-control outcomes of young women in India: A cross-sectional, observational study. *The Lancet, 373*(9678), 1883-1889. doi:10.1016/S0140-6736(09)60246-4

Riyami, A. A. (2003). Women empowerment and marital fertility in Oman. *The Journal of The Egyptian Public Health Association, 78*(1,2), 55-72.

Salam, A. A. (2013). Nuptiality and fertility in Saudi Arabia: An appraisal of census data. *Middle East Fertility Society Journal, 18*, 147-153. Retrieved from http://dx.doi.org/10.1016/j.mefs.2013.04.006

Sathar, Z. A., & Kiani, M. F. (1998). Some consequences of rising age at marriage in Pakistan. *The Pakistan Development Review, 37*, 541-556.

Sivasankaran, A. (2014). *Work and women’s marriage, fertility and empowerment: Evidence from textile mill employment in India*. Retrieved from http://scholar.harvard.edu/files/asivasankaran/files/jobmarketpaper-anithasivasankaran.pdf

StatCorp. (2009). *Stata data-management reference manual: Release 12*. College Station, TX: StatCorp.

United Nations Children’s Fund. (2005). *Early marriage. A harmful traditional practice: A statistical exploration*. New York, NY: UNICEF.

United States Agency for International Development. (2012). *Ending child marriage & meeting the needs of married children: The USAID vision for action*. Washington, DC: USAID.

Upadhyay, U. D., & Karasek, D. (2010). *Women’s empowerment and achievement of desired fertility in Sub-Saharan Africa* (DHS Working Papers No. 80). Calverton, MD: ICF Macro.

Upadhyay, U. D., Gipson, J. D., Withers, M., Lewis, S., Ciaraldi, E. J., Fraser, A., . . . Ndola, P. (2014). Women’s empowerment and fertility: A review of the literature. *Social Science & Medicine, 115*, 111-120.

Wado, Y. D. (2013). *Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia* (DHS Working Papers No. 91). Calverton, MD: ICF International.

Walter, N. (1998). *The new feminism*. London, England: Little, Brown.

World Health Organization. (2011, December 1). *Early marriages, adolescent and young pregnancies* (Executive Board, 130th Session, Provisional agenda item 6.4. EB130/12). Retrieved from http://apps.who.int/gb/ebwha/pdf_files/WHA65/A65_13-en.pdf

**Author Biography**

*Bola Lukman SOLANKE* has a PhD in Demography and Social Statistics from Obafemi Awolowo University, Ile-Ife, Nigeria. He specialises in Social Demography and Reproductive Health.