ORIGINAL RESEARCH ARTICLE

Couples' social characteristics, family planning, and unwanted pregnancy risk: Evidence from two Nigerian Demographic and Health Surveys

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Abstract

Increased cases of child abandonment, homeless and street children in developing countries are traceable to proportionate rates of unwanted pregnancies. Such pregnancies impose hardships on households and increased social vices in society. In Nigeria, baby factories are continually being discovered in almost every state, thereby raising concerns about the exposure of women to the dangers of unwanted pregnancies. In order to contribute to the government's efforts to control unwanted pregnancies in Nigeria, this study examined the effects of couples' social characteristics and family planning methods on unwanted pregnancies in Nigeria. We applied the Ordinary Least Squares (OLS) method of regression analysis because of its efficiency and unbiased property in statistical analysis. Survey data from the 2013 and 2018 Nigeria's Demographic and Health Surveys were used in the analysis. Results indicated that the more family planning methods are used in Nigeria, the fewer unwanted pregnancies will occur. Furthermore, the social characteristics of men are more important than those of women in predicting unwanted pregnancies. Based on other findings, literacy campaign in the Northern Nigeria where literacy rate is low, more counselling on the importance of modern family planning, and use of different strategies in population health awareness campaign across the different regions in Nigeria is encouraged. *(Afr J Reprod Health 2021; 25[3]: 51-59).*

Keywords: Education, age, contraceptive behaviour, population health, research

Résumé

Les cas accrus d'abandon d'enfants, de sans-abri et d'enfants des rues dans les pays en développement sont attribuables à des taux proportionnés de grossesses non désirées. De telles grossesses imposent des difficultés aux ménages et augmentent les vices sociaux dans la société. Au Nigeria, des usines à bébés sont continuellement découvertes dans presque tous les États, ce qui soulève des inquiétudes quant à l'exposition des femmes aux dangers des grossesses non désirées. Afin de contribuer aux efforts du gouvernement pour contrôler les grossesses non désirées au Nigeria, cette étude a examiné les effets des caractéristiques sociales des couples et des méthodes de planification familiale sur les grossesses non désirées au Nigeria. Nous avons appliqué la méthode d'analyse de régression des moindres carrés ordinaires (OLS) en raison de son efficacité et de sa propriété impartiale dans l'analyse statistique. Les données d'enquête des enquêtes démographiques et de santé du Nigéria de 2013 et 2018 ont été utilisées dans l'analyse. Les résultats ont indiqué que plus les méthodes de planification familiale sont utilisées au Nigeria, moins il y aura de grossesses non désirées. De plus, les caractéristiques sociales des hommes sont plus importantes que celles des femmes pour prédire les grossesses non désirées. Sur la base d'autres résultats, une campagne d'alphabétisation dans le nord du Nigéria, où le taux d'alphabétisation est faible, davantage de conseils sur l'importance de la planification familiale moderne et l'utilisation de différentes stratégies dans les campagnes de sensibilisation à la santé de la population dans les différentes régions du Nigéria sont encouragés. *(Afr J Reprod Health 2021; 25[3]: 51-59).*

Mots-clés: Éducation, âge, comportement contraceptif, sante de la population, recherche

Introduction

Unwanted pregnancies have become a public health problem over the last decade, especially in developing countries where available economic resources are unevenly distributed. A survey conducted in Nigeria in 2003 showed that 15% of all pregnancies were unwanted[1]. The percentage fell to 3% in 2018, which suggests that, for every 100 pregnant women in the country, 3 of them did not

want the pregnancy[2]. This high rate of unwanted pregnancies in Nigeria has given rise to many social vices, including child abuse and neglect, child trafficking, abortion, baby factories and child abandonment. Some of these abandoned children are at high risk of joining armed robbers and bandits when they become adults.

Before the introduction of the current methods of preventing unwanted pregnancies, Nigerian couples adopted natural family planning methods to space and control the number of children they had. The most common amongst them was the waiting period during which a couple abstains from sexual intercourse, especially during periods of lactation. Abstinence is 100% effective in preventing unwanted pregnancies if couples are disciplined and can control their sexual urges. The other natural method is the use of the woman's ovulation cycles to time sexual intercourse. When practising the ovulation cycle method, couples who are not interested in having a child try as much as possible to avoid sex during the woman's pregnancy fertile windows. A pregnancy fertile window is the period when a woman has a high chance of conception if she has sexual intercourse with her sex partner.

Health scholars have pointed out that the ovulation cycle method is very effective in preventing unwanted pregnancies if couples can avoid sexual intercourse for the five days before ovulation and the day immediately thereafter because human sperm can survive for up to five days in the fallopian tubes and the human egg can stay alive for 24 hours[3-5]. However, they have further indicated that the problem that couples encounter with the method is how to time ovulation accurately because ovulation times are not the same for every woman, meaning that the fertile window differs among women[6]. A study showed that while ovulation occurs early in the menstrual cycle in some women, it may occur in the middle or even the end of the menstrual cycle for others[5]. Therefore, for unwanted pregnancy to be prevented, every couple must understand the woman's menstrual cycle very well.

Because of the problem of timing pregnancy fertile windows accurately, many couples have moved away from the ovulation cycle method to the contraceptive method for family planning. In Nigeria, the most common contraceptives in use are the pill, intrauterine devices (IUD), lactational amenorrhea and injections[2]. Unfortunately, a survey revealed that the level of contraceptive use among women in Nigeria is very low. A survey conducted in 2018 found that only 10.5% of women between the ages of 15 and 49 years use modern methods of family planning[2]. This indicates that, among every 100 women within the fertile age who are not wanting further pregnancies, approximately, 11 use modern contraceptive methods. Negative attitudes towards modern family planning methods has been attributed to such factors as a fear of health complications, inconvenience, religion and access.

In terms of health concerns, studies have shown that contraceptive use carries health risks for women. For instance, oral contraceptives and contraceptive use can cause ischemic stroke in women[7-8]. Similarly, oral contraceptives were found to have exposed young American women to a greater risk of procoagulant factors, including fibrinogen and prothrombin[9]. Nevertheless, despite the health risks posed by these contraceptives, the argument remains that they are very effective in the prevention of unwanted pregnancies[10-11]. One study conducted in America determined that the use of contraceptives has reduced unwanted pregnancies to a low level,[12]. However, another study found that contraceptives do fail and the failure rate depends on the type of contraceptive[13]. The contraceptives with high failure rate include spermicides (23% failure rate) and the sponge (failure rate between 14% and 27%).

Scholars of population health have debated the causes of unwanted pregnancies. On the one hand, it is argued that men are 100% responsible for unwanted pregnancies because they do not care about what happens to a woman[14]. According to this argument, men refuse to use condoms during sex, even during women's unsafe periods, on the grounds that they do not give men the needed sexual satisfaction. Men refuse to use condoms even though they have no side effects, yet they compel women to use contraceptives despite the many side effects. Accordingly, it is argued that women suffer from mood swings, severe cramps and heavy bleeding to satisfy the sexual needs of men[14]. Supporting this argument, a study in Gaza found

that unwanted pregnancies occur because of the sexual behaviour of men[15].

The minimization of unwanted pregnancies is a social and economic concern for the government and people of Nigeria because of the high rate of child abandonment, homeless street children and social welfare costs. It is equally a security risk because some homeless adults can easily find themselves involved in criminality. Accordingly, finding solutions that will contribute to a reduction in unwanted pregnancies would be useful to the government and people of Nigeria because it will help to curb some of these social ills. The objective of the present study was therefore to determine the effects of different family planning methods and other factors, such as the social characteristics of couples, on unwanted pregnancy risk in Nigeria. The findings will be used to guide population health officers involved in the enlightenment campaign in the country.

Theory and literature

The novel work of John and Evelyn Billings in the 1950s on the ovulation cycle generated research interest in modern methods of preventing unwanted pregnancies. The ovulation cycle theory, popularly called the Billings method, maintains that, in every mature woman, there are times when conception is likely to occur if the woman has sexual intercourse with her sex partner. The Billings called this interval the pregnancy fertile window. They found that the fertile window occurs once a month in every mature woman, and the probability of pregnancy after sex is highest during this period. The theory advocates that a woman's ovulation time is usually on day 14 of the menstrual cycle, but human sperm can survive in the fallopian tubes for up to six days. Pregnancy can thus be prevented if a couple postpones sexual activity for five or six days before the day of ovulation and one day after it because the ovum can survive for 24 hours.

According to this theory, it is the duty of every woman to monitor her menstrual cycle and to properly track the number of days it takes for her to start ovulating from the first day of menstruation. Once the ovulation period has been established, the woman is to avoid unprotected sex five or six days before ovulation and one day after ovulation.

The Billing's method of family planning is natural and one of the safest birth control measures because it does not require the administration of any materials and therefore has no side effects. However, the problem with the method is that it requires the appropriate education before a woman can adapt to it. Modern contraceptives were developed because many couples were finding it difficult to predict ovulation times accurately.

Several studies conducted in various countries have examined contraceptive use behaviours and the effectiveness of modern contraceptives in the control of unwanted pregnancies[16-19]. For example, a study found that self-confidence is a major factor that affects the use of contraceptives in Iran[16]. Moreover, unwanted pregnancies have been found to be caused by a woman having multiple sex partners, a woman not being married, poverty, education, the age of the woman, the occupation of the man and contraceptive use[17-21]. It has further been shown that the rate of unwanted pregnancies is higher among poorer women than richer ones[21-22]. Similarly, the level of education attainment has a negative effect on unwanted pregnancies, which suggests that the higher the level of education attained by a woman, the less the chance of her having an unwanted pregnancy[19-20].

In Nigeria, contraceptive use is mainly determined by men[23], and the most commonly used contraceptives are the condom andthe birth control implant Implanon[24-25]. Furthermore, an empirical study revealed that, in Ibadan in Nigeria, age and having previously had an abortion were some of the factors that can contribute to unwanted pregnancies[26]. Moreover, study showed that unwanted pregnancies in Nigeria are higher among women who use modern family planning methods than those who do not and more prevalent among educated women than uneducated women[27]. Another study in Nigeria however, showed that uneducated women are at a higher risk of unwanted pregnancy than the educated ones[28]. Similarly, study in Pakistan showed that unwanted pregnancies are higher among uneducated women than the educated ones and among women who are not using any modern family planning methods[29]. Meanwhile, a previous preterm birth, complications

in a previous pregnancy and age were found to be the major contributors of unwanted pregnancies in Brazil[30].

As noted above, two studies on unwanted pregnancy in Nigeria are contradictory, especially on women education[27,28]. Moreover, it was discovered that women who practice modern family planning methods are at a higher risk of unwanted pregnancies than those who do not[27]. Does this mean that family planning is not effective in Nigeria? A potential problem identified in the study was that the sample was not representative of the true population of Nigeria[27]. To remedy the shortcomings of the study, the present study used the Demographic and Health Survey (DHS) conducted in Nigeria in 2013 and 2018 as data sources[2,31].

Methods

The authors adopted the Ordinary least squares method of regression analysis because of its efficiency in the study of the effect of a factor on another factor. Ordinary least squares estimation has advantage over other methods used in the analysis of survey data because it always shows the direction of the effect through the sign of its coefficient. Present study used data from the Nigerian Demographic and Health Surveys (DHS, 2013 and DHS, 2018), which were conducted in 36 states in Nigeria and included vital household information such as unwanted pregnancies, family planning methods, paternal and maternal education, knowledge of ovulation cycles and number of children. The surveys were highly representative because they covered the six geopolitical zones of Nigeria and generated information from 42,000 households and targeted women (15-49 years) and men (15-59 years), comprising 41,821 women and 11,868 men. An important aspect of the surveys that make them the preferred sources of research data is that the number of households selected from each geopolitical zone depended on the population of the zone. This removed the problem of bias in the selection process. The data were analysed using the regression method of ordinary least squares. The ordinary least square is very simple and easy to understand. Regression analysis is better than descriptive methods of research because it can predict the effect of the independent variables on the dependent variable more than the descriptive method.

The Model

The functional form of the model is represented as follows:

$$PR = f(FPM, WE, ME, RL, CT, KC, MT, MA, WA) \dots 1$$

where
PR = unwanted pregnancy, FPM = family planning method, WE = education level of the woman (no education = 0, incomplete primary education = 1, complete primary education = 2, incomplete secondary education = 3, complete secondary education = 4, higher education = 5), ME = education level of the man (no education = 0, incomplete primary education = 1, complete primary education = 2, incomplete secondary education = 3, complete secondary education = 4, higher education = 5), RL = religion (Catholic = 1, other Christian = 2, Islam = 3, traditional = 4, other = 5), CT = cultural affiliation (proxied by the region), KC = woman's knowledge of her ovulation cycle, MT = type of marriage (no other wife = 0, two wives = 1, three wives = 2, ………. N, where N = 15), MA = age of the man (between 15 and 59 years), WA= age of the woman (between 15 and 49), and F = functional notation.

For estimation purposes, Equation 1 is specified in an econometric form in Equation 2 below:

$$PR_i = \alpha + \beta_1 FPM_i + \beta_2 WE_i + \beta_3 ME_i + \beta_4 RL_i + \beta_5 CT_i + \beta_6 KC_i + \beta_7 MT_i + \beta_8 MA_i + \beta_9 WA + \mu_i \dots 2$$

where
$_i$= characteristics that vary across individuals, β_1–β_9 = coefficients, α = intercept and μ = error term. The other variables remain as defined above.

Results

Descriptive statistics

From the percentage distribution of the women according to the type of family planning method, Table 1 showed that use of modern family planning increased from 9.8% in 2013 to 12% in 2018, revealing an increase by 2.2% between 2013 and 2018. In similar vein, use of traditional family

Table 1: Distribution of women by type of family planning in Nigeria

Type of Method	2013 % of women	2018 % of women	% Change
Modern	9.8	12	+2.2
Traditional	5.4	4.6	-0.8
Not using	84.9	83	-1.9

Table 2: Demographic and Social characteristics of Women using different family planning methods

Characteristics	2013 Family planning use (% of women)	2018 Family planning use (% of women)
Age		
15-19	6.1	2.9
20-24	17.1	11.9
25-29	18.4	17.0
30-34	20.3	20.1
35-39	20.6	22.4
40-44	21.2	19.8
45-49	12.4	11.7
Education		
No Education	2.7	6.7
Primary	19.9	21.95
Secondary	29.2	31.20
More than Secondary	37.0	37.60

planning method fell from 5.4% in 2013 to 4.6% in 2018, that is, a decline by 0.8%. The percentage of the women who were not using any family planning method fell from 84.9% in 2013 to 83% in 2018. The distribution showed that the percentage of women using modern family planning method increased by 2.2% between 2013 and 2018. Moreover, percentage of women not using any family planning method declined by 1.9% between 2013 and 2018. The increase in the percentage of women who were using modern family planning method signifies more understanding of the importance of modern family planning method as a measure to prevent unwanted pregnancy in the country.

In Table 2 above, the rate of use of family planning method was lowest among the women in the age group 15-19, in both 2013 and 2018 Demographic and Health Surveys. However, in 2013 DHS, the highest rate of use of family planning was among the women in age group 40-44, while in 2018 survey, the highest rate of use of family planning was among the women in age group 35-39. By education characteristic, highest rate of

use of family planning was among the women with tertiary education, that is, women with more than secondary education in both the 2013 and 2018 surveys. The 2013 and 2018 DHS showed that use of family planning was lowest among women with no education.

Regression result

Table 3 was the results of the regression with data from the 2013 Nigerian Demographic and Health Survey (DHS, 2013). The results showed that all the variables of interest, that is, family planning method, the education levels of men and women, and the age of the men and women satisfied the a priori expectation, that is, they turned out with the right sign. However, education level of the man was the only variable which was not significant even at 10% level of significance. Education level of the woman was significant at 5%, and from the sign, the higher the level of education attainment of a woman, the lower the risk of unwanted pregnancy. Family planning method was highly significant at 1%, and the sign showed that the risk of unwanted pregnancy is higher among the non-users of any family planning method compared to the users in Nigeria. Moreover, age of the woman was significant at 10% while the age of the man was significant at the 5% level. The sign of the age of both the man and the woman revealed that unwanted pregnancy risk was higher among the older men and women when compared with the younger ones.

The results in Table 4 were derived from the analyses of the effect of family planning method, education and age of the man and woman on unwanted pregnancy, using data from Nigerian Demographic and Health Survey (DHS, 2018). Again, all the variables of interest satisfied the a priori expectation as shown in table 4. At the same time, the signs of the coefficients of the variables of interest were consistent with their signs in table 3 (analysis with 2013 DHS). Family planning method and education level of the man and women had negative signs. That is to say, the higher the use of family planning method in Nigeria, the lower the unwanted pregnancy risk. In the same vein, the higher the education of men and women, the lower the unwanted pregnancy risk.

Table 3: Regression result with 2013 DHS (Dependent Variable: Unwanted Pregnancy)

Variable	Coefficient	Standard error	T-value	P-value
Family planning method	-.024773	.0062998	-3.93	0.000***
Woman's education level	-.0045276	.0018868	-2.40	0.016**
Man's education level	-.0074692	.0065418	-1.14	0.254
Age of the Woman	.0103755	.0062668	1.66	0.098*
Age of the man	.0027321	.0008124	3.36	0.001 **
Cultural affiliation	.0084542	.0037467	2.26	0.024**
Woman's knowledge of the ovulation cycle	.0162906	.0042115	3.87	0.000***
Type of marriage	.0019693	.0007004	2.81	0.005**
Religion	-.000622	.0009757	-0.64	0.524
Const	1.089696	.0422536	25.79	0.000

NB: *** Significant at 1% level
    ** significant at 5% level
     * significant at 10% level

Table 4: Regression result with 2018 DHS (Dependent variable: Unwanted Pregnancy)

Variable	Coefficient	Standard error	T-value	P-value
Family planning method	-.0360732	.0032579	-11.07	0.000***
Woman's education level	-.00046	.0022234	-0.21	0.836
Man's education level	-.0067935	.0033996	-2.00	0.046**
Age of the Woman	.0257313	.0035858	7.18	0.000***
Age of the man	.0009674	.0005383	1.80	0.072*
Cultural affiliation	.0272228	.0020059	13.57	0.000***
Woman's knowledge of the ovulation cycle	.0153288	.0028768	5.33	0.000 ***
Type of marriage	.0012799	.0005462	2.34	0.019 **
Religion	-.0005536	.0004443	-1.25	0.213
Const	1.02306	.0251263	40.72	0.000

NB: *** Significant at 1% level
    ** significant at 5% level
     * significant at 10% level

Unfortunately, inconsistency occurred between the results of the 2013 and 2018 in the test of significance concerning the education level of the man and the woman. Education level of the woman was significant in the 2013 DHS analysis but not significant in the 2018 DHS analysis. Similarly, education level of the man was not significant in the 2013 DHS analysis but significant in 2018 DHS analysis. Age of the man and the woman remained significant in both the 2013 and 2018 DHS analysis.

Discussion

This study established some of the factors that contributed to unwanted pregnancies in Nigeria based on data analysed using the 2013 and 2018 DHS as shown in tables 3 and 4. Interestingly, the result of all the control variables included in the analyses, that is, cultural affiliation (proxy for region), knowledge of ovulation cycle, type of marriage and religion were consistent in sign, and equally remained significant in both the 2013 and 2018 DHS analyses. Hence, apart from education, the implication of the consistency of the results is that the factors that contribute to unwanted pregnancy in Nigeria are not changing, which is good for effective health policy intervention in the country.

The discussion will be on the results of the 2018 DHS because government policy intervention is going to be based on the research findings from the latest demographic and health survey. We used 2013 DHS analysis to check for consistency of the factors. From the results in Table 4, the most significant factors were determined to be the education level of men, family planning method, age of the man and woman, knowledge of ovulation circle and cultural affiliation (proxy for region).

Education level of the man was significant at 5% level. The negative coefficient of the education level of the man showed that the risk of unwanted pregnancy was lower in the household where the education level of the man was higher compared with the household where the education level of the man was lower. In the other way around, the lower the education level of a man, the higher the risk of unwanted pregnancy in a household. For instance, the result showed that when the education attainment of a man increases by one level, unwanted pregnancy will fall by 0.007 units.

Family planning method was highly significant at 1% level of significance and the coefficient is negative. This implies that the more Nigerian women practice family planning, the fewer unwanted pregnancies will occur. Accordingly, family planning is effective in the control of unwanted pregnancies. From the result in Table 4, when the use of family planning increases by one, unwanted pregnancy will fall by 0.04 units. The finding calls for more sensitization and counselling of the sexually active women in Nigeria on the importance of family planning so that they can change their attitude towards acceptance of modern family planning as a measure against unwanted pregnancy. Change of attitude towards modern family planning by Nigerian women is indispensable for the achievement of better population health in the country.

Next to family planning in the factors that contributed to unwanted pregnancy in the country is the age of the man and the woman. The age of the woman was significant at 1%, while the age of the man was significant at 10% level. The positive coefficient of the variable indicated that the risk of unwanted pregnancies increased as the age of the man and woman increased. This is consistent with an earlier study in Nigeria showing that the risk of unwanted pregnancy is higher among the older women[27].Moreover, from the results in table 4, Knowledge of ovulation cycle was another factor which had significant contribution to unwanted pregnancy in Nigeria from the analysis using data from the 2018 Nigerian Demographic and Health Survey. More importantly, the positive sign of the variable showed that the higher a woman's poor knowledge of her ovulation cycle, the higher the risk of unwanted pregnancy. Therefore, women who do not have knowledge of their ovulation cycle are at a higher risk of unwanted pregnancy compared with those who have the knowledge. Hence, it shows that in the event of early mandatory sex education in Nigeria, especially in the secondary schools, unwanted pregnancy will likely decline, especially unwanted pregnancy among the teenage girls.

Cultural affiliation (proxy for region) is another factor which should be considered by government when making population health policy intended to control unwanted pregnancies in Nigeria. The result in Table 4 revealed that cultural affiliation or region of residence contributed significantly to unwanted pregnancy. Going by the regional coding in the 2018 DHS, North-Central= 1, North-East= 2, North-West= 3, South-East= 4, South-South= 5, and South-West= 6. Accordingly, for effective minimization of unwanted pregnancy, different regional reproductive health campaign strategy should be designed and implemented. The earlier the different regional approach is recognized in our health policy the better for the country.

Conclusion

The present study was undertaken to help guide policy makers in the health sector in their efforts to control unwanted pregnancies in Nigeria. The main interest was on the examination of the contribution of family planning methods and social characteristics of couples to unwanted pregnancy in Nigeria. Using data from the 2018 DHS, it emerged that population health campaigns should be focused on paternal education, and family planning methods. More literacy campaigns should therefore be undertaken in Northern Nigeria where the illiteracy rate is very high, and while more sensitization on modern family planning and reproductive health is indispensable, no cap fits all strategy should be recognized in population health awareness as health workers carry their campaign across the different regions in Nigeria.

Unwanted pregnancy causes disaffection and suspicion between couple, and it imposes stress on its victims with the attendant health risks. Therefore, effective control of unwanted pregnancies will be of immense benefit to individual households and society alike because it

will improve the health and wellbeing of children, reduce the costs incurred for abortions and reduce the hardships faced by households in developing countries like Nigeria. It will further increase the availability of social services in society and reduce some of the social vices caused by unwanted pregnancies. In conclusion, it is important that efforts should be directed towards reducing the incidence of unwanted pregnancies in Nigeria because they do lead to bad social behaviour like abortion when they occur[28].

Ethical consideration

The data used in the study were from secondary source, that is, from Nigerian Demographic and Health Survey, and the survey is a public document which is available to every interested member of the public for research. The study did not involve human experiment.

Contribution of authors

Joseph I. Amuka the topic, wrote the abstract and the introduction of the paper, and participated in the analysis and discussion of the research finding. Tochukwu G. Onyechi reviewed relevant literature, participated in structuring of the methodology, formatted the work and compiled the references. Fredrick O. Asogwa built the Model, participated in the analysis of the work, and helped in the interpretation and discussion of the research findings. Anthony O. Agu participated in the review of literature, interpretation of result and editing of the paper.

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