INVESTIGATION OF THE EFFECT OF EDUCATION ON FERTILITY AMONG WOMEN, IN KAKAMEGA NORTH DISTRICT, KAKAMEGA COUNTY, KENYA

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ABSTRACT

The Republic of Kenya - Kenya Demographic Health Survey (2008-2009) report revealed that Total Fertility Rate (TFR) decreased from a high of 6.7 for women with no education to 3.1 for women with at least some secondary education. This formed the motivation for the study. The purpose of the study was to statistically determine the relationship between education of women and fertility in Kakamega North District. The study employed the sample survey method of data collection. Women of child bearing age (15-49 years old) formed the study population. The data collected was analyzed by use of Chi-Squares to test the degree of relationship between the variables of study and fertility .Poisson Regression was also used to come up with a model of how the variables of study influenced fertility in the District. The study revealed a negative correlation between education and fertility. It was evident from the analysis result that, women who had higher levels of education used contraceptives to a greater extent, they got married at advanced ages, gave birth to fewer children and breastfed their children the fewest number of times during the day. The findings are expected to be useful to policy makers in Kakamega North District when designing appropriate plan of action to encourage many women to pursue education to high levels.

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Introduction

The relationship between education of women and fertility is greatly context specific, varying by regions of the world, level of development and time (Jejeebhoy, 1995). Social scientists have long observed a strong inverse relationship between education of women and fertility. Across countries, higher levels of education appear to be associated with fewer children per woman. To be specific, the last forty years have seen widespread fertility declines due to increase in educational attainment levels in most western countries (Cleland and Georgia, 1998). In fact, there is a negative relationship between the number of years a girl spends in school and the number of children she bears as an adult. The higher the level of education the more the women are likely to pursue a professional career and delay having children. The effects of education in Peru and Colombia show that, fertility declines with additional threshold of formal education (Tuman, 2007).

 Up to 1970s, the fertility in sub – Sahara Africa remained high with an average total fertility rate of about 6.7 births per woman and the differences between countries and regions were modest. Over the past quarter century, significant fertility declines have occurred particularly in Eastern and Southern Africa, while fertility has remained at high pre-transitional levels in many countries in Western and Middle Africa (Bongaarts, 2010). The total fertility rates of individual countries in 2000–2005 ranged from a high of 7 births per woman in Niger to below 3 births in South Africa (United Nations, 1995). In addition, fertility is usually higher in rural, than in urban areas, higher among the uneducated than among the educated women, and higher in households with low, rather than high incomes (Rutstein, 2002, Merrick, 2001).

It is also widely believed that education affects fertility through a number of indirect ways such as, delaying the age at first marriage and also increasing the practice and effectiveness of contraception (Jejeebhoy, 1995). Education is thought to enhance women's autonomy and control over childbearing decisions through conjugal relationships and increased control over economic resources (Jejeebhoy, 1995, Stromquist, 1998). Moreover, while fertility remains high in Africa as a whole, this is changing in several parts of the continent, most notably in Southern Africa and Kenya (Watkins, 1995). The fertility decline in South Africa and in Kenya has been attributed to a number of factors such as increased use of contraceptives, the rising age at marriage, and the higher levels of education for women in countries like Zimbabwe, Botswana,

and Kenya, relative to the rest of the continent. In Kenya the TFR decreased from as high as 6.7 for women with no education to as low as 3.1 for women with at least some secondary education (Republic of Kenya -2009(KDHS), 2008-2009). This rapid fertility decline in Kenya has received a great deal of attention from demographers over the past decade (Watkins, 1998). Comparing to neighboring Tanzania and Uganda, Kenya has achieved a higher level of economic development and a higher level of educational attainment for girls at the primary and secondary levels, which are factors that may help explain the fertility transition underway in the country (UNICEF, 1999).A study done in Central Kenya, revealed that women with high level of educational attainment experience lower fertility levels (Mathenge, 2008). In Western Kenya, increase in schooling led to a decrease in fertility (Duflo, Dupas and Kremer) .Many studies that have been done in Kenya have revealed that fertility is declining in many areas due to rising levels of education of women. On the contrary, this is not the case in Kakamega North District. Kakamega North District Development Plan (2008-2012), revealed a high Total Fertility Rate of 5.0 in the District. This has been attributed to by low transition rates of girls to higher levels of education hence making them get married at an early age, which puts them at a risk of bearing many children.. A study on investigation of effect of education on fertility has not been done in the District. This project therefore carried out a statistical investigation of the effect of education of women, on fertility in Kakamega North District of Kakamega County, Kenya.

Objective of the study

The main objective of this study was empirically investigate how education operates through the Proximate determinants of fertility (woman's contraception, sterility and post partum insusceptibility) to affect fertility among women in Kakamega North District, Kakamega County.

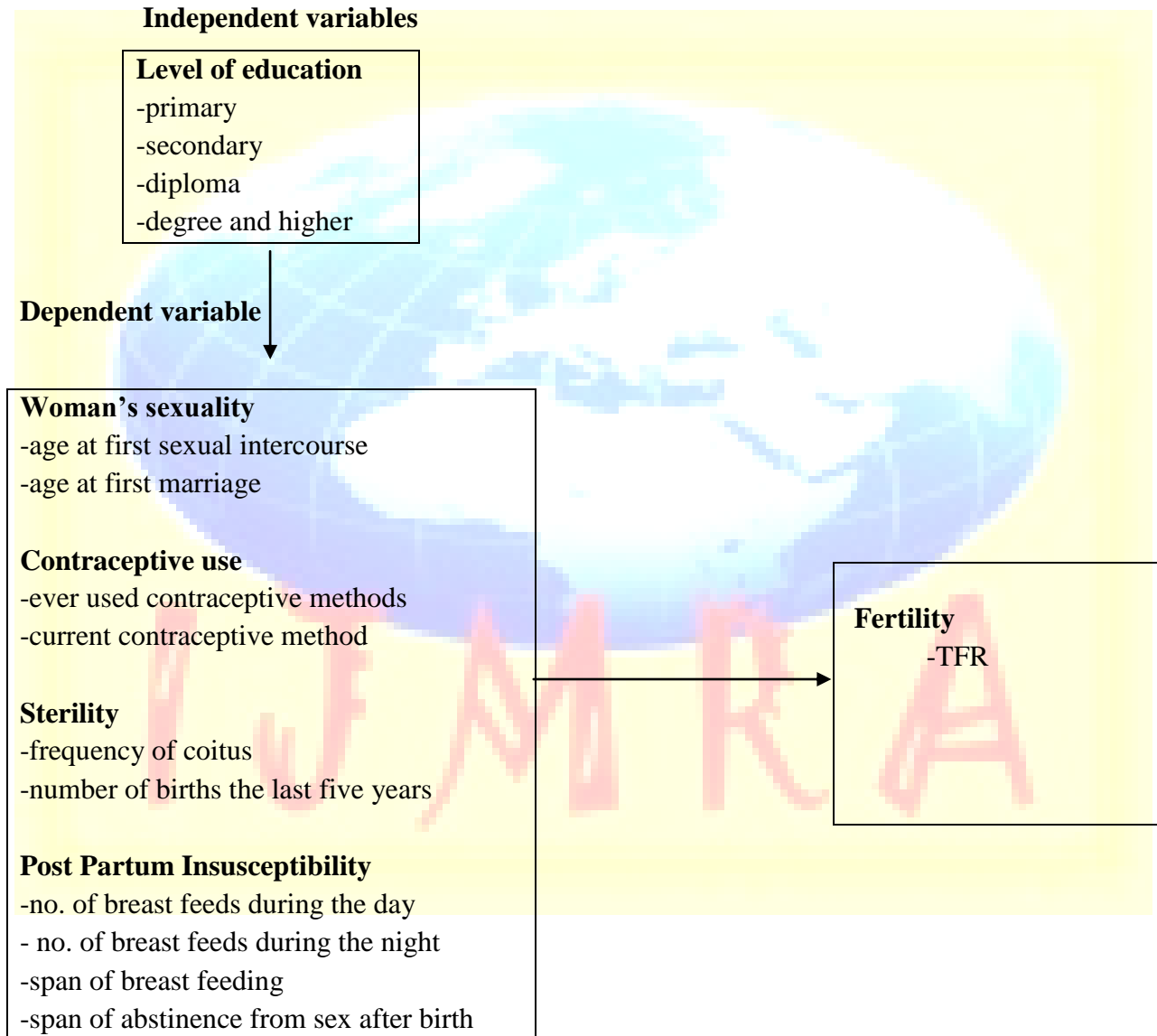## Significance of the study

This study will help shed more light on how women's level of education affects fertility in Kakamega North district, Kakamega County, Kenya. Communities and especially women with low level of education would also learn about the importance of having small families, as those of their counterparts with higher level of education. The stakeholder in the District would also

find the results of this study useful when formulating policies geared towards improving women's education and also, would help them with   population control especially in rural areas.

Conceptual framework

The conceptual framework indicates the following variables which will be measured against investigation of level of education of women on fertility.

Independent variables

Level of education
-primary
-secondary
-diploma
-degree and higher

Dependent variable

Woman's sexuality
-age at first sexual intercourse
-age at first marriage

Contraceptive use
-ever used contraceptive methods
-current contraceptive method

Sterility
-frequency of coitus
-number of births the last five years

Post Partum Insusceptibility
-no. of breast feeds during the day
- no. of breast feeds during the night
-span of breast feeding
-span of abstinence from sex after birth

Fertility
 -TFR

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Literature review

Global perspective of the effect of women's education on fertility

In many parts of the world Total Fertility Rates (TFRs) have been decreasing dramatically during the twentieth century, mostly after 1960. As population becomes more educated, the number of children per woman reduces. In fact, the last forty years have seen widespread fertility decline accompanied by increase in educational attainment levels in most western countries. While in 1960, the average woman in North America or industrialized Europe would have 3.4 and 2.6 (TFR) children respectively, fertility rates in developed nations are now below the replacement rate of 2.1, ranging from 2.0 in the United States to 1.6 in France and Canada, 1.4 in Japan, and just below 1.2 in Italy. In some cases where education expansion has been relatively more recent and initial levels were particularly low, the decline in fertility between 1960 and 1990 has been even more dramatic; it went from 2.9 to 1.1 in Spain, from 3.2 to 1.4 in Portugal, and from 3.8 to 1.9 in Ireland. In general, about a quarter of the fertility decline in Germany, Italy and Ireland, a third of the drop in Portugal and Spain, and as much as half of the fall in Greece, can be attributed to the effect of rising female education (Cleland and Georgia, 1998).

In recent years, many studies have suggested that Latin America is in a state of demographic transition. Population in the region grew faster than in any other region of the world between 1920 and 1970. Subsequently, population growth rates slowed considerably in the decades of the 1980s and 1990s, falling to a regional annual mean of under 2 percent (Jeffery and Basu, 1996). Recent scholarship attributes the decline of falling fertility to improvements in education, contraceptive use and expanded labor market opportunities for women. Studies of the region have found a strong inverse relationship between levels of formal education and fertility.

The examination of the effects of education on fertility in rural areas of two Latin American countries has demonstrated that education and fertility remain inversely related in rural Colombia and Peru (Elizaga, 1974). The improvement of access to education has increased the empowerment of women and creation of a more comprehensive health and family planning framework (Rodriguez, 1996).

Historically, fertility transition was generally accompanied by sustained economic growth. Fast socio economic progress contributes to decline in fertility among women. At the same time, however, growth in GDP per capital translates into decline in fertility. Also, education has been

revealed to enhance women's autonomy and control over economic resources (Jejeebhoy, 1995). On this count, then economic growth appears to be contributing to fertility decline.

Statistical approach to investigation of fertility

Onoja and Osayomore (2012), in their study which was entitled, "Modeling of Determinants of Fertility Among Women of Child Bearing Age in Nigeria" , had used generalized linear model (Poisson Regression Model) and a Natural Log link function, to explore, to what extent fertility determinants affected the level of fertility among women of child bearing age in Nigeria. In their Analysis, the dependent variable (the main outcome variable) was level of fertility. The predictor variables were divided into two categories as follows; proximate determinant of fertility: current marital status, age at first marriage, age at first sexual intercourse, age at recent sexual intercourse, post partum amenorrhea, abstinence and insusceptibility, age at first birth as well as use of contraceptives. Next, the Socio demographic variables which were found to significantly impact on the level of fertility, which included: place of residence (Rural or Urban), Individual Wealth Index (poor, average, rich), Household Wealth Index (poor, average, rich – measured as the median wealth index of all members of the household to which a respondent belongs), highest educational status and Whether a husband lives in the house with the woman or not.

Their model presented a negative correlation between level of education of women and fertility by indicating that women who had secondary, primary education or no formal education respectively had 1.19, 1.47 and 1.48 times more children compared to those who had completed tertiary education. It also showed that poor women had 1.04 times more children than the rich women while women from poor households had 6% higher fertility compared to those from rich households.

Effect of women's education on fertility in Sub Saharan Africa

According to Bongaarts and Potter (1983), fertility is directly determined by a set of Biological and Behavioral variables called proximate determinants, which are; Age at first marriage (women's sexuality), contraception, sterility, induced abortion and post partum insusceptibility. Fertility transition changes occur in these proximate determinants with some having negative effects on fertility, for example increasing age

at marriage. Others have positive effects, for example declines in the duration of post partum infecundability.   Bongaarts (2010) reveals that until 1970s, fertility in sub-Saharan Africa remained high with an average TFR of around 6.7 births per woman and differences between regions and countries

were modest. In addition, substantial differences in reproductive behavior exists between social economic groups within the countries. Fertility is usually higher in rural than in urban areas, higher among the uneducated than among the better educated women, and higher in households with low rather than high incomes (Merrick, 2001, United nations, 1995).Due to rise in women's education, most countries in sub-Saharan Africa continue to experience fertility decline. Countries where the most recent declines in fertility have been substantial are; Eritrea, Namibia and Togo (Bongaarts, 2007). In fact, a considerable body of research underscores the general inverse association between education and fertility. Shapiro and Tambashe (2003), emphasizes the impotence of women's education as a key factor contributing to fertility decline in sub-Saharan Africa. It is anticipated that countries with relatively large increases in the share of women with at least some secondary education would exhibit larger declines in fertility as compared to countries with smaller increases.

Effect of women's education on fertility in East Africa

The countries of Kenya, Uganda and Tanzania constitute the diverse cultures, political

 and geographical region often referred to jointly as East Africa. Despite the attention to the education on the region in the past thirty years, the adult literacy rates for men range from a high of 86% in Kenya to 79% in Tanzania and 74% in Uganda and the rates of women remain substantially lower at 70% in Kenya, 57% in Tanzania and 50% in Uganda (UNICEF, 1999).

Although family planning activities began in late 1950s in all the three countries, it was until 1990s that Tanzania and Uganda adopted a national population policy, while Kenya developed a National Council for Population and Development in 1982 (Republic of Kenya-KDHS, 1993, Republic of Tanzania-TDHS, 1996, Republic of Uganda- UDHS, 1995) .The total fertility rate (TFR) was estimated to be 6.6 in Tanzania (Ominde, 1975), 6.6 in Kenya (Republic of Kenya-KDHS, 1989) and 7.1 in Uganda (Republic of Uganda-UDHS, 1988/1989). The TFR remained high in Kenya and in Tanzania through the late 1970s (with no reports for Uganda during this

period of civil wars), with Kenya reporting rates of 7.9 in the 1977/78 Kenya fertility survey and in the 1979 census (Republic of Kenya-KDHS, 1989), and Tanzania reporting a TFR of 6.9 in its 1978 census (Republic of Tanzania-TDHS, 1993). By the late 1980s and early 1990s, Kenya, Tanzania and Uganda were in the midst of quite different fertility transitions. The Republic of Kenya-KDHS for 1989 reported a TFR of 6.7, and the report stated that this was the first evidence of a major decline in fertility in Kenya. Republic of Kenya- (KDHS, 1989), the (Republic of Tanzania-TDHS, 1993) also indicated that fertility rates were lower in the survey than in the 1988 census. The rapid fertility decline in Kenya has received a great deal of attention from demographers over the past decade (Watkins, 1998, Westoff and Rodriguez, 1995) compared to neighboring Tanzania and Uganda, Kenya has achieved a higher level of economic development and a higher level of educational attainment for girls at the primary and secondary levels, which are factors that may help explain the fertility transition underway in the country (UNICEF, 1999). Early fertility remains common in much of the developing world. According to Republic of Kenya- KDHS (2008-2009) half the total mothers interviewed had their first child before leaving their teen years and 24% of girls aged 15 to 19 had started child bearing. Emphatically, there is a strong positive correlation between education and delay in the onset of fertility, and a strong negative correlation between education and the number of children. Girls who drop out of school early are also probably at risk of having children early.

Education of women and fertility

Education is valued because it contributes to national development through provision of an appropriate human resource that helps to spur productivity and eliminate poverty, diseases and ignorance. Education of girls in particular, contributes to various aspects of their lives such as, increased productivity, family health and nutrition, reduced fertility rates and related infant mortality rates as outlined by Shapiro and Tambashe (2003). Kwesiga (2002), in his book, points out that women's education positively correlates with the inclination and ability to work thus stimulating them to participate in a wider range of jobs including agriculture and industry. Other studies in Nigeria also found that education of mothers promotes personal and domestic hygiene , the knowledge of causes of disease, their prevention and cure, and the nutritional requirement of infants, which in turn leads to low infant mortality rates and hence less need for

large families. Education also creates a sense of control over one's life by increasing available choices, such as whether and when to get pregnant and it enables women to abandon any negative traditional patterns of life. The mother's education seems to have more effects than the fathers on increasing the child's achievement at school. This kind of gain is especially important for tackling inhibiting cultural traditions.

Results

Induced Abortion is one of the determinants of fertility. Due to the sensitivity of its nature, the data obtained for the field about it was very unreliable hence; induced abortion variable was removed from the analysis. The Remaining four determinants of fertility (Women's sexuality, Contraception, Sterility and Post Partum Insusceptibility), were all subjected to the analysis. They were first modeled individually and were found to be all significant in defining fertility. Step modeling was then done which revealed the insignificance of Post Partum Insusceptibility in defining fertility. The adequacy of the model was assessed by analyzing the deviance (by comparing the differences in the size of residuals between models), Estimates of the corrected Akaike's Information Criterion (AIC) provided with the output of the analysis from the R-program was used for goodness of fit test. A lower value on AIC indicated a better fit of the model. Also, a value less than 2 but close to 1 if obtained, when residual deviance is divided by degrees of freedom indicated that the model was adequate.

Table 5.1   Association of variables with level of fertility

Variables	Model for the Individual variable	Full Model
Level of Woman's Sexuality Age at 1st Sexual Intercourse Age at 1st Marriage	2.28e-08***	0.012827*
Level of Contraceptive Use Ever used Contraceptives Used Contraceptives to space child or to stop child bearing	1.59e-11***	0.001183**
Level of Sterility Do you think you are sterile	1.98e-08***	0.000130***

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In Union but without child for the last 5 years		
Level of Post Partum Insusceptibility Number of breast feeds during the day Duration of breast feeding	0.000161***	0.37977

The * gives the level of significance of the variables. Thus, the variable with *** is a more significant determinant of the dependent variable, followed by the one with ** and then lastly the variable with *.

The full Model thus arrived at was thus;

Log y = $B_0 + B_6X_6 + B_{22}X_{22} + B_{20}X_{20}$

Log (fertility) = 2.09912 – 0.03167(Age at first Marriage) + 0.44608(Ever used contraceptives) – 0.48165(In union without a child for the last 5 years)

  It was therefore evidenced from the study that level of education of women in the study area operated through Women's sexuality, Contraceptive use and Sterility to affect fertility.

Conclusion

Post partum insusceptibility (PPI) is the inability of a woman to conceive due to intense breast feeding and post partum sexual abstinence. This was measured by the number of breast feeds during the day. There was no statistical significant relationship between number of breast feeds during the day y and level of education. There was no statistical significant relationship between number of breast feeds during the day and the number of children born to a woman.

This study was limited to investigation of the operation of education through women's sexuality, contraception use, Sterility and Post Partum Insusceptibility to affect fertility of women. A study should be conducted, which could involve the determination of effect of intervening variables such as culture and religion on level of education of women and hence the level of fertility of women in Kakamega north district. In this study, Poisson regression modeling was used to determine the significant determinants of fertility in the district. A similar study could be done by use of binomial or logistic regression to improve on these findings.

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