Education and Fertility: The Role of Fertility Levels on Educational Attainment of Children

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Abstract

This study investigates the relationship between fertility and education through levels of education of a mother and her children. The study used primary data collected in Morogoro region among women who have reached their menopause. A total of 654 women were included in the survey. The logistic regression model results show that women with lower fertility have higher odds of having children who attain bachelor degrees. Majority of firstborns who obtained bachelor degrees or above came from families with lower fertility. A similar trend of educational attainment was observed among second born and last born.

Keywords: Fertility, Education, Educational Attainment, Tanzania

Introduction

Tanzania experienced fertility decline from a Total Fertility Rate (TFR) of 5.7 in 2005 to 5.0 in 2020 (National Bureau of Statics (NBS), 2020). One reason for fertility decline was educational attainment (Kravdal, 2001; Vavrus & Larsen, 2003). Various literature has documented the fundamental role of educational attainment in women fertility patterns, as noted by Jalovaara et al. (2019) that highly educated women tend to have lower fertility levels than less educated women. Several causal mechanisms have been put forward to explain the association between educational level and fertility. First, being enrolled in education itself may lead to postponement of childbearing because combining learning activities in one side and mother roles on the other side is in fact demanding, given that

they both entail time-intensive tasks. Second, education may increase people's aspirations and ability to pursue a career. Thus, women might further postpone childbearing until they are well established in their careers (Tropf & Mandemakers, 2017).

Likewise, Cannon & Harper (2019) show that several mechanisms might contribute towards the relationship between education and fertility, such as increased autonomy, exposure to new norms of childbearing and gender, increased employment opportunities and therefore, opportunity cost of childbearing, improved health behaviours, and the indirect effects of delayed marriage and decreasing child mortality. The relationship between education and fertility is based on several channels. The fundamental mechanism behind this relationship is parental investment in their children's education due to economic incentives, resulting from reduction in the number of births. Education tends to increase the opportunity costs of not working in order to have and raise children. As a result of this substitution effect, more education should decrease fertility (Diebolt et al., 2017).

Similarly, career outcomes for employed women with higher education improve, while fertility decreases at ages following graduation, suggesting that the result is primarily influenced by the increasing opportunity cost of children (Kountouris, 2020). Thus, women's educational attainment is associated with their fertility schedules. Doren (2019) noted that since the 1970s in the United States of America, college-educated women had been substantially delaying having children. In contrast, less educated women have experienced less change, leaving recent cohorts with significant educational differences in the time of childbearing.

In developing countries with relatively high levels of fertility, data on reproductive intentions, fertility preference, and value of children are usually collected to understand factors that motivate families to regulate fertility, to predict future fertility levels, to estimate unmet needs in family planning and to assist in the design of policy and interventions targeted at fertility and reproductive health outcomes (Utomo et al., 2021). Educated couples were forerunners in the process of fertility decline because they were not only in the situation of being most pressed to control childbearing but also because they knew reproductive mechanisms and effective contraceptive methods, had the economic possibility to get them and had the necessary capacity to use them (Manfredini et al., 2021).

Postponement, spacing births more widely, and family limitation have all contributed, to some extent, to the observed increases in duration to the next birth among more educated women in Eastern Africa. Thus, appearing to be complementary rather than mutually exclusive motives for adopting birth control at the population level. The evidence from Eastern Africa suggests that women who have attended secondary school increasingly control their fertility in all three ways (Towriss & Timaeus, 2018). In Uganda, change in education had a small contribution to the observed variation in fertility between the 2006 and 2016 surveys. It is important to note here that the change in risk of childbearing for women in rural areas with primary and secondary levels of education was associated more with the observed change in fertility than with the changes in the composition of women by educational attainment (Ariho & Nzabona, 2019).

This paper expands the discussion of the relationship between fertility and education by linking fertility levels of mothers and educational outcomes of their children. Evidence of relationships between levels of fertility of mothers and educational outcomes remains scarce in African countries. Therefore, this paper contributes to the discussion of education and fertility by looking at the role of mothers' fertility levels on their children's educational attainment.

Materials and Methods

This study is based on primary data collected in Morogoro region, Tanzania. Morogoro is the region located in the Eastern zone of Tanzania. Researcher selected Morogoro region because it is situated at the crossroad between major cities in Tanzania hence having a diverse population with different ethnicity and religious beliefs. Primary

data were obtained through a self-administered questionnaire. A questionnaire was distributed in person to selected women who had reached their menopause. A total of 654 women were included in the survey. Data were quantified by using frequency distribution and cross-tabulation. Then, a chi-square test was performed to determine if there were significant associations between variables. Afterwards, a logistic regression model was used to assess the relationship between fertility and education.

Findings and Analysis

Tanzania has a higher fertility rate, with TFR of five children per woman in 2020 (NBS, 2021). The study examined the levels of fertility in relation to education of mother and her children. This study divided women in the study area into two categories. Women with lower children than the average TFR of five were considered women with lower fertility. Women with children equal or above average TFR of five were considered as women with higher fertility.

Concerning levels of education, the study divided the levels into three categories: primary and secondary education, certificate and diploma, and bachelor degree or above. The study considered levels of education of mother, firstborn, second born and last born. The aim was to understand how levels of education relate to fertility levels.

Table 1 summarises the relationship between levels of education and levels of fertility. Majority of mothers with post-secondary education have low fertility compared to the average TFR of 5.0. In contrast, most mothers with primary or secondary education have higher fertility than the average TFR. The relationship between mother education levels and fertility levels was statistically significant (p = 0.029).   This finding was in line with the study by Jalovaara et al. (2019) in Nordic countries. They found that the lowest educated women had the highest fertility, and highly educated women had the lowest. However, this pattern of fertility has almost vanished in the youngest cohorts. In a different study, Kebede et al. (2019) linked disruption on female education and fertility stalls around 2000 in African countries. They suggested that for most countries experiencing fertility stalls around 2000; there have been stalls in the education improvement of female cohorts that entered the prime childbearing ages around the time of the Structural Adjustment Policy.

It is clear that a higher level of education is more likely to decrease the number of children that married couples choose to have. Moreover, educationally conscious women tend to have fewer children (Nozaki, 2017). Tropf & Mandemakers (2017) challenges the typical approach of explaining differences and trends in fertility timing mainly by invoking educational difference. Differences between families and societal changes and upheavals across time can substantially impact fertility timing, which may be mistakenly attributed to the causal influence of just one factor.

Table 1: Level of Education and Fertility Levels

Level of Education	Fertility Levels		
	Low Fertility "n (%)"	**High Fertility** "n (%)"	**Total** "n (%)"
Mother			
Bachelor or Above	18 (54.5)	15 (45.5)	33 (100.0)
Certificate or Diploma	48 (61.5%)	30 (38.5)	78 (100.0)
Primary or Secondary	243 (46.0)	285 (54.0)	528 (100.0)
Total	**309 (48.4)**	**330 (51.6)**	**639 (100.0)**

First Born	153 (64.6)	84 (35.4)	237 (100.0)
Bachelor or Above	27 (34.6)	51 (65.4)	78 (100)
Certificate or Diploma	93 (36.9)	159 (63.1)	252 (100)
Primary or Secondary	**273 (48.1)**	**294 (51.9)**	**567 (100)**
Total			
Second Born	99 (55.0)	81 (45.0)	180 (100)
Bachelor or Above	18 (40.0)	27 (60.0)	45 (100)
Certificate or Diploma	111 (39.8)	168 (60.2)	279 (100)
Primary or Secondary	**228 (45.2)**	**276 (54.8)**	**504 (100)**
Total			
Last Born	129 (63.2)	75 (36.8)	204 (100)
Bachelor or Above	21 (53.8)	18 (46.2)	39 (100)
Certificate or Diploma	129 (36.4)	225 (63.6)	354 (100)
Primary or Secondary	**279 (46.7)**	**318 (53.3)**	**597 (100.0)**
Total			

Source: Field Survey, 2021

In connection to firstborn education, the study findings revealed that most firstborns who obtained bachelor degrees or above came from families with lower fertility. In contrast, the majority of firstborns with lower than bachelor degrees came from families with higher fertility. A similar pattern of fertility was associated with second born and lastborn. This trend suggests that families with fewer children invest more in children education than families with many children; as noted by Diebolt et al. (2017), a decline in fertility rate at the time of the French demographic transition caused investment in education to increase.

Afterwards, all significant variables were entered in the binary logistic regression model. Independent variables in the model include level of education of mother, firstborn, second born and last born. The dependent variable in the model was the fertility level. In this model level of fertility had a binary variable with 1 = high fertility (five or more children) and 0 = low fertility (less than five). Independent variables were entered in the model as a categorical variable with two categories as bachelor degree or above and less than a bachelor degree.

Table 2 presents the results of the logistic regression model. The firstborn's level of education was the only significant variable (p = 0.000) in explaining the relationship between level of education and fertility. The odds ratio of a mother with five or more children to have a firstborn with a bachelor degree was lower by a factor of 0.270. This result pointed out a link between lower fertility and having children with a bachelor degree.

Table 2: Results for Logistic Regression Analysis for Relationship between Level of Education of Mother, First Born, Second Born, Last Born and Levels of Fertility

Level of Education	B	S.E.	Sig.	Exp(B)
Mother	0.617	0.562	0.272	1.854
First Born	-1.309	0.325	0.000	0.270
Second Born	0.170	0.331	0.609	1.185
Last Born	-0.724	0.384	0.059	0.485
Constant	0.913	0.301	0.002	2.491

Source: Computed from Field Survey, 2021

Conclusion

The findings of this study show that most mothers with post-secondary education have low fertility compared to the average TFR of 5.0. In contrast, most mothers with primary or secondary education have higher fertility than the average TFR. Also, the study found that the majority of firstborns who obtained bachelor degrees or above came from families with lower fertility. Second born and last born follow a similar pattern as firstborns. Results of the logistic regression model pointed out a link between lower fertility and having children with a bachelor degree.

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