



Received: 20 March 2017  
Accepted: 07 August 2017  
Published: 31 August 2017

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Reviewing editor:  
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## EDUCATION POLICY | RESEARCH ARTICLE

# Parental education and high school completion in the urban informal settlements in Kenya

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**Abstract:** A well-established empirical association exists between family background and children's educational attainment. Studies have shown the importance of parental education for not just children's educational outcomes but also other behavioral, and health outcomes. In this paper, data collected by African Population and Health Research Center in 2012 across Nairobi's slums are fitted to a logistic regression to estimate the likelihood of secondary school completion. Even after controlling for influential covariates such as socioeconomic status; parental survivorship; slum area of residence and duration of stay; marital status; and substance abuse the effect of parental education on secondary school completion persists. Among female adolescents compared to male adolescents, parental presence, drug abuse, and migration into the slum compared to birth in the slum were associated with lower school completion. Overall, the study confirms the importance of parental education for adolescent secondary school completion but extends its effects beyond that reported in the literature on SSA, which is that mother's and father's education affect the acquisition of literacy and numeracy, math achievement, age for grade, and cognitive development.

### ABOUT THE AUTHORS

Benta A. Abuya's key research interests include: education policy issues of access, equity, and quality; the linkages between education and health outcomes for adolescents; and gender issues in education.

Patricia Elungata's expertise is in quantitative social research.

Maurice Mutisya has a special interest in understanding the linkages between education and health, with particular focus on the marginalized groups.

Caroline W. Kabiru is driven by her passion to support efforts to ensure that all young people live healthy and reproductive lives. Her research interests center on issues related to adolescent health, including resilience and positive youth development.

Together we bring a strong quantitative and qualitative research method to the study of education. Moreover, we provide a blend of how education can be a catalyst for youth development, while providing a multidisciplinary approach to the study of educational outcomes. In particular, we show how children (boys and girls) can be resilient through the challenges of slum life to complete high school.

### PUBLIC INTEREST STATEMENT

It has been established fact that education of parents is important for the education outcomes of children. If parents complete high school, there are better chances of their children completing high school too. This is true for both male and female children. In this study, children whose parents were not alive, and those whose parents moved into the slums were negatively affected in terms of their high school completion. Overall, there should be investment into the education of the current generation of children in order to benefit their future generations.

**Subjects: Adult Education and Lifelong Learning; Educational Research; Education Studies; International & Comparative Education; Secondary Education; Education Policy & Politics**

**Keywords: adolescents; female; parental education; high school; completion; slums; Nairobi**

## 1. Introduction

A well-established empirical association between family background and children's education attainment exists (Buchmann & Hannum, 2001). Studies have underscored the importance of parental education not only for children's educational outcomes but also behavioral outcomes such as health-seeking behavior, sexual and reproductive health among others (Abuya, Mutisya, & Ngware, 2015; Abuya, Oketch, Mutisya, Ngware, & Ciera, 2012; Dubow, Boxer, & Huesmann, 2009). A large part of the evidence stems from developed nations, though some evidence is now emerging from low- and middle-income countries (LMICs) (Abuya, Mutisya, & Ngware, 2014; Abuya et al., 2012; Samir & Peasgood, 1998). Abuya et al. (2014) using cross-sectional data from Kenya, find that both mother and father education influenced child numeracy and literacy skills. Samir and Peasgood (1998) using longitudinal data from Tanzania find that demand for education was associated more with the mother's education rather than the father's education, especially among girls, but additionally with the sex of the household head.

Education attainment in these studies was differently defined ranging from the acquisition of literacy and numeracy skills to school enrolment; as such the findings are of limited comparability. In this paper, however, we measure education attainment as completing secondary school. We examine the effect of parental education on educational attainment of adolescents aged between 18 and 24 years living in Nairobi informal settlements while controlling for other household and individual characteristics. In Section 1.1, we briefly describe the context of education in Kenya and review literature on determinants of education attainment in developing countries with a key interest on parental education and mechanisms through which it influences attainment.

### 1.1. Kenyans education context

The Kenyan system of education has greatly changed since independence. The changes were mainly driven by the need for an education that is responsive to the needs of citizens and the country development agenda (Ominde, 1964) as well as expand access to education (Lelei & Weidman, 2012). Immediately after independence, Kenya adopted the East African System of education which comprised of 7 years in primary school, 4 years in secondary school (O-level), 2 years in high school (A level) and a minimum of 3 years in university (Wanjohi, 2011). The country maintained the same system of education even after the collapse of the East African Community in 1977. However, during the period, discussions on education reforms continued to take place in order to address the evolving needs of the country. This led to formation of commissions to deeply reflect on whether the system of education was responsive to the needs of the country. These needs included; promoting unity and Africanism as well as address development needs. Some of the reports that attempted to address the needs of the country included; the Ominde report of 1964 (Ominde, 1964), national committee on education objectives and policies commonly known as the Gachathi report of 1976 (Gachathi, 1976) and Mackey report of 1981 (Mackay, 1981). The Mackay report is the one that recommended the removal of the two "A" level education years

Therefore, the Mackey report set foot for the Commission of Higher Education which recommended replacement with the 8-4-4 system of education in 1985, which has been in operation to date. The 8-4-4 system broadened the curriculum in pursuit of making the system more relevant to the needs of learners and country at large and integrated pre-vocational and technical education (Lelei & Weidman, 2012). From 1985, other commissions recommended the reduction of the number of subjects taught at both primary and secondary level and rationalization of the curriculum as well as cost-sharing. Though the two systems of education did not pay much attention to early childhood education, it is widely practiced in the country under the 8-4-4 system. The responsibility of ECDE

was vested on communities and municipal councils, with no direct investment by government. Currently, early childhood education is vested on the counties under the devolved system of governance, while all other levels (primary, secondary, and tertiary) are under the national government. There is proposed curriculum being piloted, which integrates early childhood (2 years in pre-school and 3 years in lower primary), middle primary school (3 years), lower and senior secondary schools of three years each and a minimum of three university education years.

In January 2003, barely a month after being elected into office, the President of Kenya-Mwai Kibaki led the government to realize one of his most important pledges by introducing the Free Primary Education (FPE) program. FPE had one main purpose: nationwide access to free primary schooling for all young Kenyans through government-funded schools (Oketch & Rolleston, 2007; Oketch & Somerset, 2010). The FPE program was the most recent and perhaps the most successful among other numerous attempts at giving children access to primary schooling. Other attempts had been made in 1974 initiated by the then the first president of Kenya (Sifuna, 2004); while the second was initiated in 1979 by the second president of Kenya. Research evidence shows that the immediate response to the introduction of free education in 1974 and 1979 was huge. For instance, enrolments rose in grade 1 by 150% in 1974 and by about 60% in 1979. However, these massive gains were not sustained, in part because of their effects on the quality of learning. Consequently, there was reduced impact of the 1974, and the 1979 FPE policy declaration—so that by the time the children reached higher grades their impact had virtually disappeared (Oketch & Rolleston, 2007; Somerset, 2007, 2010). It should be noted that neither of these programs succeeded in giving the children full access to primary education (Sifuna, 2007).

## 2. Parental education and education attainment/Theoretical framework

Research evidence, over time, has demonstrated the important role that education plays in economic development of not only countries but also individuals. Human capital theories posit education as an investment that maximizes life time opportunities (Card, 2001). Central to this, is the contribution of education toward upward social mobility by moving individuals from poverty (Buchmann & Hannum, 2001) which in turn contributes to social economic growth of countries (Buchmann & Hannum, 2001; Paiva, 1992). With this importance, it is critical to continue to examine the drivers of education within countries and households and in LMIC context.

Over the years, the number of completed school years has increased significantly. Globally, the average number of schooling years increased from a low as three in 1950 to about eight in 2010 and from two to seven in LMICs (Barro & Lee, 2013). While sub-Saharan African region showed the least growth, the average schooling years increased by about 4. In Kenya, while the estimates of secondary school attainment are scanty, they range from 18 to 22% in 2010 (Barro & Lee, 2013). Further the expected average years of schooling have consistently been eleven between 2008 and 2013 (UNDP [<https://hdr.undp.org/en/content/expected-years-schooling-children-years>]). This is equivalent to incomplete secondary education. Overall, however, the growth in the average completed years of schooling across generations' remains understudied as such the need to continuously examine the drivers of attainment at the different education levels exists, with a key focus on the differentials in education attainment by parental levels of education.

While there is relationship between parental education and that of their children, the mechanisms through which the transmission occurs are not concretely examined. The existing evidence, however, point to a number of mechanisms through which parents' education might conceivably affect children's education attainment. First, parents' education might affect their beliefs and behaviors toward their children (Eccles, 1993). Taylor, Clayton, and Rowley (2004) argue that parent's beliefs and behaviors form part of academic socialization, which is the way in which parents shape their children behavior and attitude in order for them to fit in the society. Parents are foremost role models to their children, and therefore exhibit certain expectations for their children that reinforce their own beliefs and expectations (Eccles, 1993). Through this, parents demonstrate some behaviors that may relate to sharing information and creation of opportunities for prosperity based on the

expectations they have for their children. In the African context, children success in school is not only valued by parents but also by the society; children education acts as a social protection for the parents. However, there are differentials in parental beliefs which are shaped by their own education attainment. Parents who possess higher levels of education may exhibit different behaviors compared to those with no education (Dubow et al., 2009). Through this, education plays a clear indirect role in influencing child education attainment and aspiration (Dubow et al., 2009).

Second, higher levels of education are associated with increased income at individual and household level. However, Carneiro and Heckman (2004) notes that in the US, it is not just the parental income that explains the education of their children but rather more stable factors such as the education of the parent and the permanency of their income. This transmission mechanism point to a more complex relationship between parental education and their children education attainment. This complex interrelationship is mediated by the income of the parents. Among the urban poor, who are characterized by low levels of income from casual labor, which does not guarantee a stable income (African Population and Health Research Center [APHRC], 2014), the complex relationship may not be apparent, and we postulate that it is the parental education that matters more than the income. The income of the urban poor is meager and can hardly meet their basic needs and education is therefore secondary, yet they strive to educate their children. Moreover, measuring income accurately in low-resourced settings is difficult and often complicated by the causal nature of employment opportunities as well as social networking and support which may be inform of finances or in kind and therefore use household social economic proxies such household assets and amenities (Clark, Madhavan, Cotton, Beguy, & Kabiru, 2017).

Other notable ways through which parental education is transmitted include parental involvement and support in their children school. Parents with higher levels of education are able to support their children in their school especially at home and also guide them through the schooling process and career choice (Desforges & Abouchaar, 2003). Moreover, parental involvement and support is associated with increased learning achievement, which in turn increases the chances of higher educational attainment (Desforges & Abouchaar, 2003). These mechanisms do not occur in isolation, but can either interact or even mediate each other to influence children schooling. In this paper, we therefore explore the contribution of parental education on completion of secondary school education controlling for household socioeconomic status and other influential variables as reported in the literature.

### 3. Data and methods

We use Nairobi Cross-Sectional Slum Survey (NCSS II) data from all informal settlements of Nairobi in 2012 collected by the APHRC. The survey collected detailed socio-demographic characteristics of both the households and their membership (individuals). The survey was modeled like the Demographic and Health Surveys (DHS) commonly conducted in LMIC countries and had components for men, women of reproductive health and young people. For detailed description of the NCSS II see APHRC (2014). We used data collected through a special module for the youth. The young people component targeted individuals aged between 12 and 24 years and living in the sampled households. In total, 2,765 young people were reached. The young people module collected information on their schooling, parental education, marital status, religion, age, gender among others. In this paper, we focus on the young people aged between 18 and 24 years, which is the standard age for completion of secondary education in Kenya-our measure of education attainment. In total 1,685 individuals who participated in the young people component were aged 18–24. The analysis sample was limited to 1,213 individuals with complete information on both mother's and father's educational attainment. We excluded individuals with missing variables or those who refused to answer the questions used to create our main measures.

### 4. Variables and measurement

The dependent variable is secondary school completion (form four), which is equivalent to grade 12. Secondary school completion was constructed using the highest level of education reported by the

adolescent, coded 1 for those who had attained at least form four or more but 0 for all others. The key covariates considered were: mother's and father's educational attainment which were coded as either "0" for "primary or less" but "1" for "secondary or more", parental survivorship which was coded "0" for "at least one parent dead" but "1" for "two living parents", and area of residence, coded "0" for "Nairobi West", 1 for "Nairobi East" and 2 for "Nairobi North". Key individual level covariates considered were: marital status coded "0" for "those not in a union" and "1" for "those in a union", duration of stay in the slum which was coded into four groups, "0" for "since birth", "1" and "2", respectively, for durations of "less than 2 years" and "2 to 4 years", and lastly 3 for a duration of "5 or more years". Alcohol or other substance abuse were coded "0" for "never used" and "1" for "ever used". Religion was coded, "0" for "Catholic", "1" for "any other Christian Religion", but "2" for "all other religions". Lastly, ethnic origin was coded as either "1" or "2" or "3" or "4" or "5", respectively, for "Kamba", "Kikuyu", "Luhya", "Luo", and "Kisii" ethnic groups; all other ethnic groups were coded "6". To capture household socioeconomic status, principal component analysis (PCA) method was used to construct an asset index based on different household assets and amenities. The asset scores were then divided into 3 groups coded "1", "2", and "3", respectively, for the poorest, middle, and richest households.

## 5. Analysis

We conducted both descriptive and inferential data analysis. The descriptive analysis involved frequencies and percentages given most of the variables were categorical. We used logistic regression with robust standard errors to estimate the relative risk of secondary school completion. Separate logistic regression analysis for males and females were estimated because the options and decisions regarding access to education have been shown to differ significantly by gender (Samir & Peasgood, 1998). Moreover, in the combined model, the effect of gender on secondary school completion was large enough to warrant separate analysis. All regression analysis were adjusted for area of residence effects, using a fixed effect (fixed effect parameters and constants not shown), and for clustering of responses at the household. We reported 95% confidence intervals for all parameters and exact  $p$ -values from Wald tests of significance for all tests where  $p > 0.001$ . The results of these analyses estimate the cross-sectional association between secondary school completion, socioeconomic status and other covariates. All analyses were based on weighted pooled data in order to adjust for non-response and over-sampling in some areas; sampling weights were used for both bivariate and multivariate analyses. All computations were done using STATA version 13.1. The standard errors and corresponding confidence intervals of the estimates were computed using bootstrap approach.

## 6. Results

Results from the descriptive analysis in Table 1 show form four completion among both male and females increases with increasing age, completion is however slightly higher across all age groups among males compared to females. Completion rates are higher regardless of gender among adolescents whose mothers and fathers have completed secondary education or higher compared to those who have completed primary education or less. However, among the male adolescent, the completion rate was higher compared to female given their parents had secondary education or higher. Completion rates are comparable among male adolescents regardless of the survival of their parents, among females, however, adolescents with both parents alive report higher completion rates compared to single or double orphans. By ethnicity the lowest completion rates are observed among females of Luo ethnicity, and males of Kikuyu ethnicity. By marital status female adolescents who reported being in union were less likely to complete form four compared to those who were currently not in union, this variation is, however, not observed among male adolescents. Among female adolescents the completion rate is highest among those who were born and have lived in the slum from birth but decreases with increasing reported duration of stay in the slum, no clear variation is observed among male adolescents. Both female and male adolescents who reported ever having used drugs in their life are less likely to complete form four compared to those who report never having used drugs. Reported completion rates did not vary significantly by living arrangement, household socioeconomic status, or area of residence.

**Table 1. Proportion completed form four education by socio-demographic characteristics**

	Female	Male	
<i>Age (in years)</i>			
18	21.7	33.3	119
19	45.6	35.8	156
20	48.0	54.0	177
21	50.4	53.4	173
22	48.9	46.2	198
23+	48.8	56.3	390
<i>Educational attainment (mother)</i>			
Primary or less	37.2	40.0	730
Secondary plus	56.6	67.9	483
<i>Educational attainment (father)</i>			
Primary or less	33.1	35.5	507
Secondary plus	54.1	60.4	706
<i>Parents survival</i>			
At least 1 dead parent	34.3	55.2	297
No parent dead	49.3	48.1	916
<i>Current living arrangement</i>			
Lives with a parent	55.6	45.9	238
Lives with no parent	43.1	50.6	975
<i>Socioeconomic status</i>			
Poor	31.7	42.6	364
Middle	43.4	48.4	414
Rich	55.8	61.5	435
<i>Ethnicity</i>			
Kamba	50.3	45.1	264
Kikuyu	56.7	41.1	214
Luhya	38.7	52.0	294
Luo	31.6	47.0	218
Kisii	56.4	72.2	114
Other	47.4	54.8	109
<i>Area of residence</i>			
Nairobi West	42.0	50.7	486
Nairobi East	53.8	53.3	472
Nairobi North	37.7	40.0	255
<i>Marital status</i>			
Not in unionmj	55.7	50.3	725
In union	35.9	46.4	487
<i>Duration of stay in slum</i>			
Since Birth	56.5	46.2	114
<2 Years	48.0	52.5	600
2–4 Years	41.6	47.0	302
5+ Years	38.0	48.5	197

(Continued)

**Table 1. (Continued)**

	Female	Male	
<i>Drunk in last 30 days</i>			
Never drunk	44.5	48.1	1,088
Drunk	66.7	55.1	125
<i>Ever used drugs</i>			
Never drugs	45.5	52.0	1,138
Drugs	42.9	38.2	75
<i>Religion</i>			
Catholic	49.5	55.0	304
Pentecostal	44.4	48.5	858
Other	38.5	40.0	51
<i>Total</i>	45.5	49.6	1,213

### 6.1. High school completion among males in the urban informal settlements

Table 2 presents results from the ordered logistic regression for secondary school completion among adolescent males residing in informal settlements of Nairobi and aged 18–24 years. The results show that adolescents whose mothers had completed secondary or higher education were about three times as likely to complete secondary education. After controlling for father level of education, though the effect of mother education on secondary school completion though attenuated remained significant. In the full model (model 4 of Table 2), the effect of mother and father level of education remains significant with high school completion significantly higher among males whose parents have secondary education. Other factors associated with high school completion among male adolescents included substance abuse, ethnicity, area of residence, and age. Ever use of drugs was associated lower educational attainment, male adolescents who resided in informal settlements to the east of Nairobi were about 50% more likely to complete form four education compared to those from Nairobi North area.

### 6.2. High school completion among female adolescents in the urban informal settlements

Results for the ordered logistic regression for secondary school completion among female residents aged 18–24 years are presented in Table 3. Female adolescents whose mothers had completed secondary or higher education was about twice as likely to complete their secondary education. After controlling for father level of education, the effect reduces to an OR of 1.7. Like in the male adolescent model, father education was also significantly associated with educational attainment. Female adolescents whose fathers had secondary education or higher were also about twice as likely complete form four compared to those whose fathers had completed primary education or less. In the full model, model 4 of Table 3, the effect of mother and father level of education remain significant and with more less the same magnitude. In addition, females who reported that both their parents were alive were about 50% more likely to have completed their secondary education compared to those who had at least one parent dead. Unlike the male adolescent results household social economic status was associated with increased likelihood of completing secondary education among female adolescents. Females from households in the richest tertile were almost three times as likely as the poorest to complete their secondary education. As expected, early marriage was an impediment to education attainment, with female adolescents who were in marital union at the time of interview being 60% less likely to have completed their secondary education as compared to those not currently in a union. Compared to those who reported having been born in the slum those who moved into the slum were less likely to have completed their secondary education—the likelihood decreased by about 20% with every 2 year increase in duration of stay in the slum for those not born with the study sites. Female adolescents who reported ever having used drugs and those of the Luo ethnicity were 70 and 40% less likely to have completed their secondary education as compared to

**Table 2. Logistic regression model predicting completion of form four education based on mother’s education among male residents 18–24 years in Nairobi’s informal settlements**

Characteristics		Model 1		Model 2		Model 3		Model 4	
		OR	95% CI						
Mother education	Primary or less (Ref.)	1		1		1		1	
	Secondary plus	3.2***	[1.9,5.4]	2.2**	[1.2,3.7]	2.2**	[1.3,3.5]	2.2**	[1.3,3.8]
Father education	Primary or less (Ref.)			1		1		1	
	Secondary plus			2.2**	[1.3,3.5]	2.0***	[1.4,2.8]	2.0***	[1.5,2.8]
Parent survival	At least 1 parent dead (Ref.)					1		1	
	No parent dead					0.7	[0.4,1.1]	0.7	[0.4,1.2]
Socioeconomic status	Poor (Ref.)					1		1	
	Middle					1	[0.4,2.6]	0.9	[0.4,2.2]
	Rich					1.4	[0.7,2.7]	1.8	[0.8,4.0]
Area of residence	Nairobi North (Ref.)					1		1	
	Nairobi East					1.4*	[1.0,1.9]	1.5*	[1.0,2.3]
	Nairobi North					1	[0.4,2.8]	1.2	[0.4,3.8]
Marital status	Not in union (Ref.)							1	
	In union							0.7	[0.3,1.6]
Duration of stay in slum	Since birth (Ref.)							1	
	<2 Years							1	[0.4,2.8]
	2–4 Years							0.7	[0.2,2.4]
	5+ Years							0.9	[0.3,2.6]
Alcohol use	Never drunk (Ref.)							1	
	Drunk in last 30 days							1.5	[0.7,3.2]
Substance abuse	Never drugs (Ref.)							1	
	Ever used drugs							0.6**	[0.4,0.9]
Religion	Catholic (Ref.)							1	
	Other Christian							0.9	[0.5,1.7]
	Other							0.5	[0.2,1.3]
Ethnicity	Kamba (Ref.)							1	
	Kikuyu							0.8	[0.5,1.3]
	Luhya							1.2	[0.9,1.8]
	Luo							1.1	[0.5,2.5]
	Kisii							3.6**	[1.4,4.5]
	Other ethnicity							1.7	
Age (in years)	18 (Ref.)							1.1	[0.3,3.9]
	19							1.1	[0.3,3.9]
	20							3.8***	[1.8,8.0]
	21							2.7	[1.0,7.3]
	22							2.3	[0.5,10.3]
	23–24							4.0*	[1.1,14.2]
	Observations	397		397		397		397	
Log likelihood	-30,898.9		-30,289		-29,967.3		-27,925.2		

Note: Exponentiated coefficients.

\* $p < 0.1$ .

\*\* $p < 0.05$ .

\*\*\* $p < 0.01$ .

**Table 3. Logistic regression model predicting completion of form four education based on mother's education among Female residents 18–24 years in Nairobi's informal settlements**

Characteristics		Model 1		Model 2		Model 3		Model 4	
		OR	95% CI						
Mother education	Primary or less (Ref.)	1		1		1		1	
	Secondary plus	2.3***	[2.0,2.7]	1.7***	[1.3,2.1]	1.6***	[1.3,2.1]	1.8**	[1.3,2.5]
Father education	Primary or less (Ref.)			1		1		1	
	Secondary plus			1.9***	[1.3,2.7]	1.8**	[1.2,2.6]	1.9***	[1.4,2.6]
Parent survivorship	At least 1 parent dead (Ref.)					1		1	
	No parent dead					1.8***	[1.4,2.3]	1.5**	[1.2,2.0]
Socioeconomic status	Poor (Ref.)					1		1	
	Middle					1.8***	[1.3,2.5]	1.8***	[1.3,2.6]
	Rich					2.7***	[1.7,4.1]	2.9***	[2.0,4.3]
Area of residence	Nairobi North (Ref.)					1		1	
	Nairobi East					1.7*	[1.0,2.8]	1.4	[0.9,2.2]
	Nairobi North					1	[0.8,1.1]	0.9	[0.7,1.2]
Marital status	Not in union (Ref.)							1	
	In union							0.4***	[0.3,0.5]
Duration of stay in slum	Since birth (Ref.)							1	
	<2 Years							0.8	[0.6,1.1]
	2–4 Years							0.6*	[0.4,0.9]
	5+ Years							0.5*	[0.3,0.9]
Alcohol use	Never drunk (Ref.)							1	
	Drunk in last 30 days							1.8	[0.9,3.6]
Substance use	Never drugs (Ref.)							1	
	Ever used drugs							0.3*	[0.1,1.0]
Religion	Catholic (Ref.)							1	
	Other Christian							0.7*	[0.5,1.0]
	Muslim							0.4	[0.1,1.5]
Ethnicity	Kamba (Ref.)							1	
	Kikuyu							1.0	[0.6,1.7]
	Luhya							0.7	[0.4,1.1]
	Luo							0.6***	[0.5,0.7]
	Kisii							1.4	[0.7,2.0]
	Other ethnicity							0.9	
Age (in years)	18 (Ref.)							1	
	19							4.8***	[2.8,8.3]
	20							7.1***	[4.3,11.6]
	21							7.9***	[3.7,16.6]
	22							7.8***	[4.0,15.0]
	23+							8.8***	[6.1,12.6]
	Observations	816		816		816		815	
	Log likelihood	-41,316		-40,804		-38,760		-34,728	

Note: Exponentiated coefficients.

\* $p < 0.1$ .

\*\* $p < 0.05$ .

\*\*\* $p < 0.01$ .

those who don't use drugs or the from the Kamba ethnic group, respectively. Like the male results, among the increased we observe a linear increase of education attainment with increased age.

## 7. Discussion

The purpose of this study was to highlight the effect of parental education on educational attainment of individuals aged between 18 and 24 years living in Nairobi informal settlements while controlling for other household and individual characteristics. Educational attainment in this case was measured by form four completion. The results were analyzed for male and females separately, in recognition that the decisions made by households to send their daughters or sons to schools are different, and they may also differ by whether it is the mother or the father making the decision. The results for male adolescents show that adolescents whose mothers had completed secondary or higher education were about three times as likely to complete form four education, while those whose fathers had secondary education or higher were twice as likely to complete form Four compared to those whose fathers had lower education. For males in this sample it mattered that the mothers had secondary education or more for their sons to be able to complete form four.

In the case of female adolescents, both the mother and father effect was associated with twice the likelihood that the female adolescents would be able to complete form four. This in comparison to adolescents whose mothers and fathers had no education. The positive independent effect of parental education is similar and reinforces other findings of scholars (Abuya et al., 2012, 2014; Dubow et al., 2009). The greater independent effect of mothers education, particularly for the male children still reinforces the notion that educated mothers are more likely to have had high achieving parents (Carneiro, Heckman, & Vytlačil, 2011; Glick & Sahn, 2000). Moreover, the fact that there is a positive independent effect of both fathers' and mothers' education is similar to the findings of other studies (Abuya et al., 2014; Haveman & Wolfe, 1984) which established that parent's education explains children's success at school. The findings of this study extend the literature on the effect of parental education on adolescent education.

Another interesting finding was that compared to female adolescents who reported ever having used drugs male adolescents were only 40% less likely to complete form four education. These findings show that adolescents in the slums particularly females are vulnerable to consequential drug abuse. Despite these challenges vulnerability some adolescents still manage to complete secondary school. This agrees with urban slum research which showed that high-risk living conditions do not necessarily impede upon school completion with good academic performance (Kabiru, Beguy, Ndugwa, Zulu, & Jessor, 2012).

In addition, the study found that compared to female adolescents who came into the slum by migration female adolescents born in the slum were more likely to complete form four education. With every 2 year increase in duration of stay in the slum, migrant females were about 20% less likely to complete secondary education. We propose that migrant adolescents needed time to acclimatize to the slum conditions reducing the likelihood that they complete form four education. Moreover, it evidence has shown that adolescents living in high-risk conditions still manage to complete high school (Kabiru et al., 2012), these findings suggest that for migrant adolescents a threshold period precedes their likelihood to achieve success in school.

Results also showed that compared to orphans, female adolescents who had both parents were 50% more likely to complete form four education. This reinforces the notion that orphans often lack the social support needed to succeed in school. This finding agrees with evidence which has shown that compared to orphaned children who reside in two-parent households were more likely to do well in school (Hofferth, 2006; McLanahan & Sandefur, 1994; Schiller, Khmelkov, & Wang, 2002). The finding also confirms that vulnerability increases with orphan hood (Fotso, Holding, & Ezeh, 2009). The findings also show that compared to children with both parents, children living in brought up in single-parent families had lower educational attainment (McLanahan & Sandefur, 1994; Schiller et al., 2002; Sun & Li, 2011).

Moreover, the study found that form four completion among female adolescents, increased with increasing household socioeconomic status with the richest being about three times as likely as the poorest to complete secondary school in a setting where secondary school completion remains a critical determinant of life chances (Lewin, 2009; Lewin & Little, 2011; Rihani, 2006). Even after controlling for the effect of other covariates, the effect of parental education remains significant. Compared to female adolescents, the likelihood that male adolescents complete secondary school doubles with increasing parental education but increases slightly less among female adolescents. This confirms the findings that both mothers' and fathers' education are important for secondary school completion over and above Abuya et al.'s finding (2012, 2014) that parental education was significant for math achievement in children. This study uses data from all slums across Nairobi, findings can therefore be generalized to the whole country. The study, however, was cross sectional, and analysis was limited to adolescents with complete parental education information, in this way inference from the findings in this study can only be limited to similar settings.

Overall, the study shows that parental education is important for adolescent secondary school completion. Moreover, we conclude that the two-parent effect on adolescent education is sustained for female adolescents. The study also shows the influence of living in the slum on the chances of successful secondary school completion among female adolescents. Overall, the study extends the effects of parental education beyond that reported in the literature from SSA, that mother and father education influence; the acquisition of literacy and numeracy, math achievement, age for grade, and cognition. Since the data largely constitute primary school children results may be biased toward under-reporting findings.

#### Author contribution

Benta A. Abuya conceptualized, participated in its design and coordination, and drafted the manuscript; Patricia Elungata participated in the design and analysis of data; Maurice Mutisya participated in the interpretation of data, and drafted the manuscript; Caroline Kabiru participated in the interpretation of data and reviewed the manuscript. All authors read and approved the final manuscript.

#### Acknowledgments

We also acknowledge Dr. Alex Ezeh who led the conceptualization and provided guidance in the implementation of the NCSS 2 survey, and Yohannes Kinfu for his contribution to the implementation of the survey. We would also like to particularly appreciate the contribution of the Kenya National Bureau of Statistics who provided a sampling frame and offered their expertise in mapping and other field logistics. We would like to appreciate the dedication of field staff to their work because it was, indeed, exemplary. We also acknowledge the contribution of the office staff who worked with the field teams to ensure quality data were obtained. We are indebted to community leaders—chiefs and village elders—who were the first port of call in the study areas. Their support to field teams was critical to the success of this study. We are especially appreciative of the role the community members played by taking time off their busy schedules to respond to the survey and thus provided us with valuable data without which this report would not have been written. The interpretations in this paper are views of the author and do not reflect the views of the donors.

#### Funding

We would like to acknowledge the support of the Bill and Melinda Gates Foundation [grant number OPP1021893] which funded the collection and analysis of slum-specific data relevant to understanding the local situation of the urban poor on population, family planning and reproductive health (FP/RH), maternal and child health, and other health-related issues. Analysis and writing time for the NCSS 2 report funded by UKaid (from the

Department for International Development) for the Strengthening Evidence for Programming on Unintended Pregnancy (STEP UP) Research Programme Consortium [grant number SR1109D-6]; and through general support grants to the APHRC from the Swedish International Development Cooperation Agency [grant number 2011-001578] and the William and Flora Hewlett Foundation [grant number 2012-7612].

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#### Citation information

Cite this article as: Parental education and high school completion in the urban informal settlements in Kenya, Benta A. Abuya, Patricia Elungata, Maurice Mutisya & Caroline W. Kabiru, *Cogent Education* (2017), 4: 1369489.

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