Migration and Fertility in Uganda: Analysis of the 2016 UDHS

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Abstract

There is paucity of information on the fertility of migrants in Uganda. This paper compares the fertility of migrant and non-migrant women in Uganda and also quantifies the contribution of the factors associated with the migration-fertility differential by analyzing the 2016 Uganda Demographic and Health Survey. This study finds significantly lower fertility among migrants compared to non-migrants and observes some differences in the factors associated with the fertility of migrant women and non-migrant women. The decomposition results indicate that 51% of the difference in fertility of migrants and non-migrants was associated with variation in the socioeconomic and demographic composition of the women while the remaining 49% can be attributed to variation in fertility behavior of the two groups of women. The major factors associated with the fertility difference were differences in composition by; marital status, ideal number of children, ever use of family planning, education, wealth, current working status and co-wife status. Continued improvements in access, attendance and completion of secondary schools by all women in Uganda is a viable option to the reduction of the country's fertility levels. Efforts are needed to improve uptake of family planning methods (including traditional methods) by women and their partners. This calls for improved information, education and communication about family planning through appropriate mass media to influence changes in attitudes towards family planning, large family size preferences and other family and society norms.

Introduction

There are several types of benefits of migration (de Brauw, Mueller, & Lee, 2014). Complementing fertility and mortality, migration is one of the three components of population change. International migration is seen as one of the mechanisms through which demographic transition is disseminated (Fargues, 2011). Internal and international migration play a complex

role in the pattern of urban growth (Lerch, 2014). Internal migration and its association with fertility and mortality in shaping demographic change has not received adequate attention (de Brauw et al., 2014) yet migratory patterns have been found to be extremely important in determining the timing and spacing of births and the final number of children born to a woman after migration (Ortensi, 2015). The changing global context of migration that has both encouraged and restrained men and women in particular ways affects fertility choices (Mendoza, 2009). In many parts of the world where the first demographic transition has been completed, migration has replaced fertility and mortality as the leading agent of demographic change (Bell et al., 2015). Migration is the geographic movement of people across a specified boundary of the country for the purpose of establishing a new residence (UBOS, 2018).

Traditionally, long distance migration has been regarded as a predominantly male phenomenon and consequently migration studies have largely focused on men. Little attention has been paid to the woman as a migrant, as a migration agent and the changes that occur after migration (Ortensi, 2015). There are different views regarding the effect of geographical mobility on fertility (Eryurt & KOÇ, 2012). The generational, socialization, adaptive and selection model are the four major theoretical models that have generally been used to explaining the fertility difference of migrants and non-migrant (Majelantle RG, 2013). The main difference in these theories is in the relationship between the timing of migration and changes in the reproductive attitudes and behaviors of migrants. While the generational perspective is based on the observation that rural fertility is generally higher than urban fertility, the socialization perspective asserts that irrespective of their duration of stay in the urban area, there are no significant change in the fertility of migrants and non-migrants (Majelantle RG, 2013). The socialization hypothesis has been found to be fertility levels of migrants vary across origins of the migrants (Adserà & Ferrer, 2016). On the other hand, the adaptation model is premised on changes in tastes and adoption of urban fertility norms by migrants which occur gradually at destination among the families of migrants themselves and do not require an entire generation to pass before they take place. The adaptation hypothesis assumes that the individual's social context after relocation matters more than his or her childhood environment (Ortensi, 2015). This model does not specify how long it will take rural- urban migrants to adapt to small family norms in the urban areas (Majelantle RG, 2013). An analysis of the effects of internal migration on the fertility of post-war Austrian and Polish female cohorts using retrospective event-history data showed that generally, natives in urban areas had lower

fertility compared with non-migrants in rural areas, both in Austria and Poland and that people who move from one place to another adopt the fertility behaviour that dominates at the destination (Kulu, 2005, 2006).

The selection model is based on the fact that migration is selective. it thus suggests that the lower fertility among rural-urban migrants compared to that of native rural stayers is primarily due to the selectivity of the migration process (Majelantle RG, 2013). This model is generally used to explain why migrants sometimes have lower fertility levels than those of the population in the country of origin but fails to account for changes in life that occur in the current area of residence. The theory looks at migrants as group of people whose fertility preferences are more similar to those of the population of the area of destination (Ortensi, 2015). While exploring relations between fertility, migration, and urbanization in Thailand, (Goldstein & Goldstein, 1981) indicated that the current fertility of migrants was higher than their own earlier fertility and higher than that of non-migrants in urban areas. The study also revealed that past fertility of migrants was lower than that of non-migrants, and past fertility levels of non-migrants were generally as high as current levels (Goldstein & Goldstein, 1981). These findings suggested that migration was either selective of women with low fertility and/or that the migration process itself disrupts childbearing (Goldstein & Goldstein, 1981). Female migration may be associated with employment and this has implications on fertility changes for the migrants. Similarly, in the Philippines, some evidence of migrant selectivity in fertility was found and large fertility declines were reported to accompany post-migration employment but the estimated fertility impact is small if not followed by work for pay (Jensen & Ahlburg, 2004). A study that examined characteristics of migrants from four types of migration stream and compared with those of non-migrants at origin and destination found substantial support for the selection hypothesis (Chattopadhyay, White, & Debpuur, 2006).

The study of the impact of migration on fertility requires consideration of multiple levels of social interaction as individual choices of social locations are associated with diverse social and economic factors such as education levels, nationalities, and genders (Mendoza, 2009). There is consistently higher fertility for non-migrants than for migrants (Myers & Morris, 1966). In African cities, migration from villages and towns in the 1980s and 1990s reduced total fertility rates from an estimated average of 5.55 in the absence of migration to 4.59 (Brockerhoff, 1995). Studies (Eryurt & KOÇ, 2012; Jensen & Ahlburg, 2004; Kulu & Washbrook, 2014; Phan, 2014; Werwath,

2011) have been conducted on the fertility of internal migrants but have largely focused on rural-urban migration and its effect on fertility in non-African countries. Other studies have focused on the fertility of immigrants in industrialized countries (Adsera & Ferrer, 2011, 2014; Adserà & Ferrer, 2016; Bertoli, 2015; Fargues, 2011; Mineau, Bean, & Anderton, 1989). Rural-urban migration together with urbanization have been highlighted as facilitators of fertility decline in SSA (Brockerhoff & Yang, 1994). In Africa some of the studies that have analyzed migration and fertility (Anglewicz, Corker, & Kayembe, 2017; Banougnin, Adekunle, Oladokun, & Sanni, 2018; Chattopadhyay et al., 2006; Gyimah, 2006; Makinwa, 1985; Rokicki, Montana, & Fink, 2014) have found conflicting evidence on the migration-fertility relationship.

In Uganda, internal migrants tend to gravitate towards the more commercialized and central part of Uganda (Nzabona & Maniragaba, 2016). Results of the most recent Uganda National Household Survey revealed that although overall, 16 percent of the population had lived in another place before their current residence in the 5 years preceding the survey, the proportion of female internal migrants was higher (18%) than that of than males (14%) (UBOS, 2018). Whereas studies elsewhere have documented differential fertility of migrant and non-migrant women, in Uganda, there is paucity of information on the fertility of migrants and its comparison with the non-migrant fertility. This paper compares the fertility of migrant and non-migrant women in Uganda and the factors associated with the fertility of the women and also quantifies the factors associated with the migration fertility differential by analyzing the 2016 Uganda Demographic and Health Survey. A migrant is a person who changes his/her usual place of residence by crossing an administrative boundary and residing in a new area for a period of not less than six months or intends to stay in the new area for a period not less than six months (UBOS, 2018). This study focuses on recent migrants whom we define as those that had lived in the current place of residence for not more than 12 months.

Data and methods

Data for this study was sourced from the 2016 Uganda Demographic and Health Survey (UDHS). The UDHS was a national representative survey that collected data from 18,506 women of age 15-49 years using a two-stage cluster sampling procedure that began with the selection of clusters or enumeration areas followed by the selection of households from each cluster (UBOS & ICF, 2018). The data was collected using women's questionnaire and was formally requested from Measure

DHS. To account for the complex sampling design used in demographic and health surveys, data weighting was done using the svy command.

Variables and measurements

In this study, migration status was a variable generated from the question on duration of stay in the current place of residence. This question generated a variable on number of years that the woman had spent in her current residence. There were women who were usual residents, visitors and others depending on the number of years. We classified these into two; migrants (those who had stayed for one year or less in the current place of residence) and the rest as non-migrants. The independent variables for this analysis were; current age of the woman, education level, place of residence, wealth class, region of residence, ideal number of children, knowledge about family planning methods, exposure to family planning messages via mass media, current working status, migration status, marital status, age at first sex, and current use of family planning methods and ever use of family planning. The dependent variable in this study was fertility as measured by the total number of children ever born. Although we used CEB as the dependent variable, the age specific fertility rates (ASFR) and TFR of the women were computed to show comparison of estimated fertility levels of the migrant women and their non-migrant counterparts.

Data analysis

Data analysis involved the generation of frequency distributions, examination of differentials in fertility by migration status and the multivariable regression of fertility. The age specific and total fertility estimates were obtained using the tfr2 module. The tfr2 module is a Stata command that transforms birth history data into a table of births and exposure and uses a Poisson regression model to compute fertility rates, fertility trends and fertility differentials from a table of births and exposure (Schoumaker, 2013).

The fertility differentials were assessed based on children ever born as the outcome variable and a Poisson regression of count outcomes was thus suitable method for analysis. A Poisson regression offset by the natural logarithm of the current age of women to find out the factors associated with fertility for both migrants and non-migrants. Current age of the woman was used as an offset variable because it is highly associated with the outcome variable (CEB) since CEB is likely to be higher among older women compared to younger women. A multivariable Poisson regression model was then run to identify the major predictors of number of children ever born. This analysis

identified whether there are differences in the factors associated with fertility of migrants and non-migrants. The coefficients were exponentiated to yield the incident rate ratio (IRR) to ease interpretation of the results.

$$\ln(\mu_i) = \alpha + X_i\beta_i + \ln(age)$$

A decomposition analysis was then conducted to quantify the contribution of selected characteristics and their effects on the migration fertility differential. The decomposition technique adopted is a non-linear decomposition technique (Powers, Yoshioka, & Yun, 2011) that deals with count outcomes such as number of children and thus CEB was deemed to be a more suitable outcome. The nonlinear multivariate decomposition (mvdcmp) analysis technique partitions the difference in an outcome into two components; a component of the difference that is associated with variation in selected characteristics and that associated with variation in the behavioral responses. In the context of this study, the technique portions the observed difference in CEB between migrant and non-migrant into a component associated with differences in characteristics of the women and another one associated with the variation in effects of the characteristics on CEB. This last component is what we can interpret as a childbearing risk while the first component is that which looks at the differences in the proportion of women with selected characteristics for the two groups of women. The Poisson regression was run in the decomposition model to yield the contribution of each of the selected variables to the migration-fertility variation of the women.

Results

The study sample included 3,656 migrant and 14,850 women of reproductive age as two comparative groups. Table 1 results show that the two groups were statistically different in terms of distribution by; age, education, place of residence, wealth quintile, working status, marital status, co-wife status, age at first sex, ideal number of children, current use of family planning and ever use of family planning. There sample had a high percentage of migrants in the age 15-24 years compared to non-migrants. Higher percentages of non-migrants relative to migrants were observed after the age group of 25-29 years. The percentage of migrants who had attained at least a secondary level of education was higher than that of non-migrants. The percent of women in the richest wealth quintile was higher for the migrant sample than that of non-migrant sample. Detailed distribution and percentage differences are presented in Table 1.

Table 1. Distribution of migrant and non-migrant women by selected characteristics

Characteristic	Migrants (n=3,656)	Non-migrants (n=14,850)	Difference	P-value
Age				
15-19	32.4	20.7	-11.7	
20-24	32.1	17.8	-14.2	
25-29	16.5	16.5	0.0	
30-34	9.2	14.9	5.7	0.0000
35-39	5.3	12.2	6.9	
40-44	2.8	10.1	7.4	
45-49	1.7	7.7	6.0	
Highest education level				
No education	4.9	10.8	5.9	
Primary	54.1	58.3	4.2	0.0000
Secondary+	41.0	31.0	-10.0	
Place of residence				
Urban	35.5	24.6	-10.9	0.0000
Rural	64.5	75.5	10.9	
Wealth quintile				
Poorest	14.5	18.3	3.8	
Poorer	14.2	19.4	5.1	
Middle	14.4	19.7	5.3	0.0000
Richer	20.4	19.8	-0.6	
Richest	36.5	22.8	-13.7	
Current working status				
Not working	30.5	26.1	-4.5	0.0001
Working	69.5	73.9	4.5	
Marital status				
Never married	28.1	25.3	-2.8	
Currently married	55.1	62.0	7.0	0.0000
Formerly married	16.9	12.7	-4.2	
Cowife status				
No cowife	42.4	43.2	0.8	
Has a cowife	10.2	16.0	5.8	0.0000
Not sure	47.4	40.8	-6.6	
Age at first sex				
Never had sex	14.0	14.7	0.7	
Below 15	14.1	16.7	2.6	0.0014
15-19	60.6	59.2	-1.5	
20+	11.3	9.4	-1.8	

Ideal number of children				
0-2	10.9	7.48	-3.5	
3-4	58.7	46.62	-12.1	0.0000
5+	30.4	45.9	15.5	
Knowledge about family planning				
No knowledge	1.0	1.0	0.1	0.7355
Has knowledge	99.1	99.0	-0.1	
Exposure to family planning messages				
Not exposed	30.9	31.6	0.7	0.5461
Exposed	69.1	68.4	-0.7	
Current use of family planning				
Not using	74.9	68.5	-6.4	
Traditional	2.1	3.2	1.1	0.0000
Modern	23.0	28.3	5.3	
Eve use of family planning				
Never used	48.0	41.7	-6.3	
Used in calendar year	6.0	8.0	2.0	0.0000
Used outside calendar year	46.0	50.3	4.3	

Fertility variation between non-migrant and migrant women.

Using the Schoumaker's tfr2 tool (Schoumaker, 2013), the results reveal that the total fertility of migrant women was 5.1 children per woman while that of non-migrant women was 5.5 children per woman.

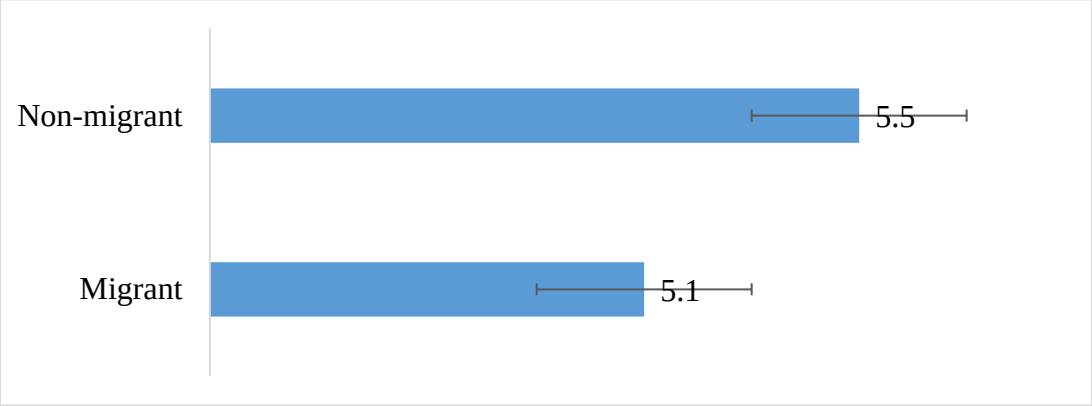

Figure 1. Total fertility rates of migrant and non-migrant women computed using tfr2 module.

The results of a simple Poisson regression of number of children ever born and migration status indicated that the fertility of migrants was significantly lower than that of non-migrant women (IRR=0.524 95% CI=0.498-0.551, p<0.001). A comparison of the age specific fertility rates for

the two groups of women shows that fertility of non-migrant women was notably higher than that of the migrants until the age 30-34 years when there is some bit of convergence. Figure 1 shows the comparison.

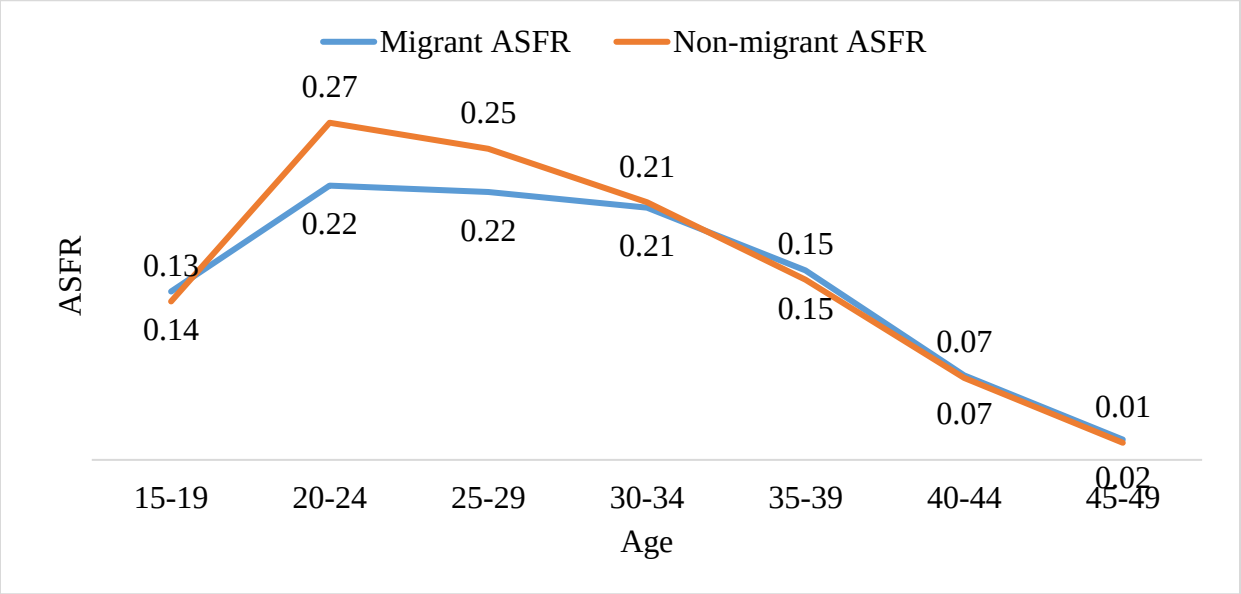

Figure 2. Comparison of ASFR of Migrant and Non-migrant women

Predictors of fertility

The multivariate Poisson regression results revealed that the fertility of migrant women was significantly associated with; education, wealth, age at first sex, knowledge about family planning methods, ever use of family planning, ideal number of children, marital status and the co-wife status of the woman. Relatedly, the fertility of the non-migrants was associated with education, place of residence, wealth quintile, working status, age at first sex, pregnancy termination, use of family planning, ever use of family planning, exposure to family planning messages, ideal number of children , marital status and co-wife status of the woman.

Table 2. Poisson regression of factors associated with CEB for non-migrant and migrant women

	Non-migrant			Migrant		
Variable	**IRR**	**P-value**	**95% CI**	**IRR**	**P-value**	**95% CI**
Education						
No education	1.000			1.000		
Primary	0.875	**0.000**	0.852-0.899	0.733	**0.000**	0.660-0.814
Secondary+	0.694	**0.000**	0.668-0.722	0.555	**0.000**	0.490-0.629
Place of residence						

Urban	1.000			1.000		
Rural	1.078	**0.000**	1.047-1.109	1.031	0.511	0.942-1.127
Wealth quintile						
Poorest	1.000			1.000		
Poorer	0.978	0.118	0.951-1.006	0.909	**0.043**	0.829-0.997
Middle	0.989	0.460	0.961-1.018	0.921	0.065	0.844-1.005
Richer	0.963	**0.019**	0.932-0.994	0.914	0.091	0.824-1.015
Richest	0.865	**0.000**	0.831-0.900	0.858	**0.010**	0.763-0.964
Previous residence						
City	1.000			1.000		
Town	1.012	0.689	0.956-1.070	1.076	0.225	0.956-1.210
Countryside	1.037	0.191	0.982-1.095	1.031	0.578	0.925-1.149
Sex of household head						
Male	1.000			1.000		
Female	0.995	0.700	0.969-1.021	1.024	0.475	0.960-1.093
Current working status						
Not working	1.000					
Working	1.041	**0.007**	1.011-1.072	1.075	0.067	0.995-1.162
Age at first sex	0.979	**0.000**	0.975-0.984	0.983	**0.002**	0.973-0.994
Ever had a terminated pregnancy						
No	1.000			1.000		
yes	1.031	**0.006**	1.009-1.053	1.067	0.072	0.994-1.146
Knowledge about family planning methods						
No	1.000			1.000		
Yes	0.934	0.598	0.724-1.205	2.638	**0.026**	1.124-6.188
Current use of family planning						
Not using	1.000			1.000		
Using traditional method	1.055	**0.034**	1.004-1.110	0.923	0.375	0.774-1.101
Using modern method	1.061	**0.000**	1.036-1.086	1.047	0.177	0.979-1.119
Ever use of family planning						
Never used	1.000			1.000		
Used in calendar year	1.173	**0.000**	1.129-1.218	1.612	**0.000**	1.413-1.839
Used outside calendar year	1.142	**0.000**	1.108-1.176	1.611	**0.000**	1.479-1.754
Exposure to family planning messages						
Not exposed	1.000			1.000		
Exposed	0.974	**0.013**	0.954-0.994	0.970	0.358	0.909-1.035
Ideal number of children						
0-2 children	1.000			1.000		
3-4 children	1.045	0.122	0.988-1.106	1.074	0.252	0.951-1.213
5+	1.298	**0.000**	1.227-1.373	1.529	**0.000**	1.352-1.729
Current marital status						
Never married	1.000			1.000		
Currently married	8.167	**0.000**	6.489-10.278	6.467	**0.000**	4.920-8.501
Formerly married	7.541	**0.000**	6.004-9.471	6.545	**0.000**	5.034-8.511
Cowife status						
Not a cowife	1.000			1.000		

A cowife	1.059	**0.000**	1.035-1.083	1.263	**0.000**	1.164-1.371
Not sure	0.993	0.810	0.939-1.051	1.201	**0.003**	1.064-1.356

For all groups, the incident rate ratio (IRR) reduced with an increase in level of education attained. For example, the fertility of non-migrant and migrant women who had attained secondary+ level of education was respectively 0.694 and 0.555 times that of their counterparts who had never attended school. Although place of residence was significantly associated with the fertility of non-migrant women, it was not the case for the migrant women. The results in Table 2 show that the fertility of rural non-migrant women was 7.8% higher than that of their urban counterparts (IRR=1.078, 95% CI=1.047-1.109). The lack of association of place of residence with the fertility of migrant women may be linked to the fact that this study dealt with recent migration (having stayed in place of residence for not more than a year). This may not have been a sufficient period to observe any fertility differences associated with place of residence for the recent migrants.

Wealth status was significantly associated with fertility of both migrant and non-migrant women although the categories that were significant all not entirely the same for the two groups of women. The fertility of non-migrant women in the richer and richest categories was significantly lower than that of their counterparts in the poorest category while for the migrant women, the association was only significant for the poorer and richest categories. The results also show that the working status of women was only significantly associated with fertility for non-migrant women.

Our findings indicate that for both migrant and non-migrant women, age at first sex was significantly associated with the number of children ever born. For the two groups of women, the findings reveal that a delayed sexual debut is associated with lower fertility for both non-migrant and migrant groups of women considered in the study. In this study we also explored the association between abortion and fertility. Women were asked if they have ever had any terminated pregnancy. The results indicate that irrespective of whether the pregnancy termination was induced or spontaneous, non-migrant women who had ever had a terminated pregnancy had higher fertility (IRR=1.031, P=0.006 95% CI=1.009-1.053) than their counterparts who had never. This association was not significant for migrant women.

Knowledge about family planning methods was associated with fertility of migrant women. The fertility of migrant women who reported having knowledge about any family planning methods

was 2.638 times that of their counterparts who did not have any knowledge about family planning. On the other hand, non-migrant women who reported being exposed to family planning messages through mass media were found to have lower CEB than their counterparts who were not exposed but there was no similar significant relationship for migrant women. The results in Table 2 also indicate that non-migrant women who reported to be currently using either a traditional or modern method of family planning had significantly higher fertility than their counterparts who were not using any method of family planning. This association was not significant for migrant women. On the other hand, the findings reveal that for both the non-migrant and migrant women, those who reported to have ever used family planning methods had higher fertility compared to their counterparts that had never used family planning.

Regarding family size preferences, the findings indicate that generally the fertility of women who reported at least 5 children as their ideal number of children had significantly higher fertility than their counterparts who reported 0-2 children as their ideal number of children. The IRR for the non-migrant and migrant women who reported an ideal number of children of 5+ was 1.298 and 1.529 respectively.

The results also indicate that currently married and formerly non-migrant women's fertility were respectively 8.167 and 7.541 times those of their never married counterparts. Similarly, the fertility of migrant women who reported that they were currently in union or married and formerly married had 6.467 and 6.545 times the fertility of their never married counterparts. This is expected since, traditionally, most of the number of children are born within marriages. Relatedly, the findings reveal that non-migrant women who reported having co-wives had significantly higher number of children ever born compared to their counterparts who did not have a co-wife. This was also the case for the migrant women. There is thus a general observation that women who have a co-wife are associated with high fertility. This may partly be explained by competition to bear many children so that they can get more support from the husbands.

Decomposition of the fertility difference

Results of the multivariate Poisson decomposition of number of children ever born indicate that slightly more than half (51%) of the difference in fertility for migrant and non-migrant women was associated with the differences in the socioeconomic and demographic characteristics of the two

groups of women while 49% was associated with differences in the fertility behavior of the two groups of women. Table 3 shows the results.

Table 3. Overall decomposition

Component	Coefficient	Std. Err.	P-value	[95% CI]	%
E	-3.24	0.008	0.000	[-0.339 -0.309]	51.4
C	-3.06	0.014	0.000	[-0.333 -0.279]	48.6

E= Endowment/characteristics; C=Coefficient or fertility behavior; CI= Confidence Interval

The detailed decomposition results reveal that overall, differences in composition of the women by education accounted for 5.7% of the observed difference in fertility. Other significant contributors were; wealth (1.6%), age at first sex (-2.2%), knowledge about family planning methods (2%), ever use of family planning methods (8.4%), ideal number of children (10.4%), marital status (35.1%) and co-wife status (-1.4%). Regarding the fertility behavior; the results show that education (28.3%), ever use of family planning (-37.1%), ideal number of children (-13.3%) and co-wife status (-14.9%) were the only significant factors on the behavior component. The overall percentage contribution to the fertility variation is obtained by adding all the significant percentages for categories of a variable. Details are presented in Table 4.

Table 4. Detailed decomposition results

	Characteristics component				Behavior component			
Variable	**Coef.**	**Std.error**	**P-value**	**%**	**Coef.**	**Std.error**	**P-value**	**%**
Education								
No education	1.00				1.00			
Primary	0.13	0.024	*0.000*	-2.1	-1.08	0.340	*0.002*	17.2
Secondary+	-0.49	0.058	*0.000*	7.8	-0.70	0.214	*0.001*	11.1
Place of residence								
Urban	1.00				1.00			
Rural	-0.02	0.037	0.510	0.4	-0.34	0.369	0.356	5.4
Wealth quintile								
Poorest	1.00				1.00			
Poorer	0.04	0.020	*0.045*	-0.6	-0.14	0.099	0.145	2.3
Middle	0.03	0.016	0.063	-0.5	-0.14	0.092	0.128	2.2
Richer	-0.01	0.005	0.093	0.1	-0.10	0.110	0.356	1.6
Richest	-0.14	0.054	*0.009*	2.2	-0.03	0.164	0.878	0.4
Previous residence								
City	1.00				1.00			

Town	0.05	0.041	0.211	-0.8	0.14	0.151	0.341	-2.3
Countryside	-0.03	0.052	0.567	0.5	-0.03	0.470	0.941	0.5
Sex of household head								
Male	1.00				1.00			
Female	0.01	0.016	0.466	-0.2	0.10	0.117	0.408	-1.5
Current working status								
Not working	1.00				1.00			
Working	-0.07	0.036	0.063	1.0	0.28	0.351	0.424	-4.5
Age at first sex	0.14	0.043	*0.002*	-2.2	0.70	0.956	0.467	-11.0
Ever had a terminated pregnancy								
No	1.00				1.00			
yes	-0.04	0.02	0.074	0.6	0.08	0.087	0.351	-1.3
Current use of family planning								
Not using	1.00				1.00			
Using traditional method	0.01	0.011	0.370	-0.2	-0.05	*0.035*	0.153	0.8
Using modern method	-0.03	0.026	0.179	0.6	-0.04	0.120	0.721	0.7
Ever use of family planning								
Never used	1.00				1.00			
Yes, in calendar year	-0.09	0.013	*0.000*	1.4	0.28	0.063	*0.000*	-4.4
Yes, outside calendar year	-0.44	0.042	*0.000*	7.0	2.06	0.303	*0.000*	-32.7
Exposure to family planning messages								
Not exposed	1.00				1.00			
Exposed	0.00	0.002	0.408	0.0	0.00	0.250	0.987	0.1
Ideal number of children								
0-2 children	1.00				1.00			
3-4 children	0.08	0.068	0.254	-1.2	0.12	0.697	0.697	-2.0
5+	-0.66	0.098	*0.000*	10.4	0.84	*0.019*	0.019	-13.3
Current marital status								
Never married	1.00				1.00			
Currently married	-2.87	0.151	*0.000*	45.5	-1.66	1.475	0.259	26.4
Formerly married	0.63	0.029	*0.000*	-10.0	-0.17	0.242	0.488	2.7
Cowife status								
Not a cowife	1.00				1.00			
A cowife	-0.15	0.028	*0.000*	2.4	0.33	0.082	0.000	-5.3
Not sure	0.24	0.083	*0.003*	-3.9	0.61	0.219	0.006	-9.6

Discussion

This study finds that migrant women have significantly lower fertility compared to their non-migrant counterparts. This fertility variation may be attributed to differences in the socioeconomic

and demographic characteristics of the migrants and the non-migrants. The decomposition findings indicated that slightly more than half of the difference in fertility for migrant and in migrant women was associated with the differences in the socioeconomic and demographic characteristics of the two groups of women. For instance, there were more migrants who had completed at least a secondary level of education compared to their non-migrant counterparts. The fertility effect of higher education attainment by women is well document and we may link this fertility difference to such effects. This finding is partly in line with that of a study conducted in Puerto Rico (Myers & Morris, 1966) which found that consistently higher fertility for non-migrants than for migrants. It has been highlighted that migrants' risk of conception declines dramatically around the time of migration and remains lower in the long run among most migrant groups (Brockerhoff & Yang, 1994). However, the study finding disagrees with those of a study conducted in Kinshasa (Anglewicz et al., 2017) which revealed that migrants had significantly higher fertility than permanent residents although the difference was relatively small in magnitude and those of an analysis of the fertility impact of rural-urban migration in China which suggested that migrants generally had higher fertility than native urban residents (Werwath, 2011). Furthermore, the finding disagrees with those of a study on the impact of migration on fertility in Ghana which revealed that the completed fertility patterns of lifetime Accra residents were similar to those of residents who migrated (Rokicki et al., 2014).

Our findings indicate that the factors associated with the fertility of migrant women were; education, wealth, age at first sex, knowledge about family planning methods, ever use of family planning, ideal number of children, marital status and the co-wife status of the woman. On the other hand, the fertility of the non-migrants was associated with education, place of residence, wealth quintile, working status, age at first sex, pregnancy termination, use of family planning, ever use of family planning, exposure to family planning messages, ideal number of children , marital status and co-wife status of the woman. In the decomposition model, education, wealth, age at first sex, ever use of family planning methods, ideal number of children, marital status and co-wife status were the significant contributors to the fertility difference associated with differences in the women's characteristics. On the behavioral component, only education, ever use of family planning, ideal number of children and co-wife status were significant.

Our findings indicate that marriage was associated with the biggest contribution to the migrant-non-migrant fertility differential. Specifically the difference in the proportion of women that were currently married or in union was associated with 46% of the fertility differential when other factors were controlled. This is explained by the fact that the non-migrant women had higher proportion (62%) of marrieds compared to migrants (55%) and that more than a quarter of the migrant women were never married. This is expected since marriage is among the proximate determinants of fertility. This finding thus confirms what other studies (Beatty, 2016); (Rutayisire, Hooimeijer, & Broekhuis, 2014) and (Ezeh, Mberu, & Emina, 2009). Relatedly, the findings revealed that polygamy was also associated with a significant proportion of the fertility difference. The findings showed that due to the fact that the non-migrant women had high proportion that reported being co-wives compared to the migrant women's proportion, the fertility differential associated with this fact was 2.4%. A study of determinants of change in fertility in Uganda (Ariho, Kabagenyi, & Nzabona, 2018) also highlighted the importance of type of marital union in fertility studies

The differences in the proportion of women whose ideal number of children was at least five children was associated with 10% of the observed fertility differential. This is largely because in the migrant sample, three in ten women preferred to have 5+ children while in the non-migrant sample, 46% of the women preferred 5+ children. Family size preferences influence opinions, attitudes and motivations for fertility control. Our findings are in agreement with those of other scholars (Banougnin et al., 2018; Bongaarts & Casterline, 2013; Chowdhury, 2010; Ezeh et al., 2009; Lyager, 2010; Ramsay, 2014; Westoff & Cross, 2006) that have also reported the importance of family size preferences in fertility differentials and the general transition to low fertility.

Our findings highlight that ever use of family planning was a significant contributor to the observed fertility difference between migrant and non-migrant women. The findings show that ever use of family planning methods was associated with 8% of the difference in fertility for the two groups of women. The effect of ever use of family planning on fertility behavior was also significant (associated with 33% of the unexplained component of the differential). The findings indicated that more non-migrant women reported having ever used family planning compared to their migrant counterparts. This partly explains why the fertility difference for the two groups. This finding is partly in line with a study of internal migration and contraceptive knowledge and

use in Guatemala found that migrants possess limited knowledge of contraceptive methods and thus may have unmet need for family planning as well as limited choice of methods (Lindstrom & Hernández, 2006). The fertility inhibiting effect of family planning is evident in this study and has been documented (Ezeh et al., 2009; Garenne, 2008; Majumder & Ram, 2015; Rutayisire et al., 2014; Westoff & Cross, 2006) in studies done in sub Saharan Africa and elsewhere. It has also been asserted that the relatively low fertility of recent migrants in their first few years than long term residents can be partly linked to the dramatic increases in use of modern methods of contraception (Brockerhoff, 1995).

Education accounted for a significant share of the migrant-nonmigrant fertility differential. Our findings revealed that 8% of the fertility difference can be attributed to the fact that more migrant women had attained at least a secondary level of education compared to their non-migrant counterparts. Education influences fertility levels through postponement of marriage, increased contraceptive use. This finding partly disagrees with (Adsera & Ferrer, 2014; Banougnin et al., 2018) who found no association between education and migration-fertility difference. Our study agrees with previous studies that have documented education as a key predictor of fertility levels and more specifically that education attainment has an inverse relationship with fertility in many countries (Beatty, 2016; Dwivedi, Sediadie, & Ama, 2016; Shakya & Gubhaju, 2016; Shapiro & Gebreselassie, 2008; Westoff, Bietsch, & Koffman, 2013; Zhang, 2011).

Wealth index is a household level characteristic that is generally known to be a very important factor in the fertility transition. Household wealth is associated with the ability and ease to access and obtain quality services such as those to do with fertility regulation. Our findings also highlight that with respect to wealth, differences in proportion of migrant and non-migrant women who were in the highest wealth quintile accounted for 2% of the difference in fertility. This is in agreement with studies elsewhere (Dribe, Hacker, & Scalone, 2015; Neal, Chandra-Mouli, & Chou, 2015; Williams et al., 2013) that have highlighted the importance of wealth in predicting fertility levels.

This study finds no evidence that current place of residence and previous residence were significantly associated with the observed migration fertility difference. This study partly agrees with a study on the impact of migration on fertility and abortion in Ghana which revealed that the completed fertility patterns of lifetime Accra residents were remarkably similar to those of

residents who migrated (Rokicki et al., 2014). Our findings however partly disagree with findings of a study conducted in Urban Nigeria (Makinwa, 1985) and those of a study in China (Werwath, 2011) that migrants generally had higher fertility than native urban residents. Similarly, the working status of the women was not associated with a significant contribution to the fertility difference. This partly contradicts findings of a study in the Philippines (Jensen & Ahlburg, 2004) which found that large fertility declines accompany post-migration employment.

Our conceptualization of a migrant considered a person who had lived in the current place of residence for not more than 1 year. This conceptualization potentially leaves out long term migrants or migrants who declared themselves as usual residents in the current place of residence. Never the less, this study assesses the association between current migration and fertility of women in Uganda and then compares the predictors of fertility for migrant women and non-migrant women. Further studies can be conducted to explore this association by classifying long term migrants, short term migrants and non-migrants and also to examine the effect of fertility on migration. Furthermore, our study is limited because of its cross sectional nature. Our findings show association. We are unable to draw causal inferences about the fertility differences.

Conclusions

This study finds that migrants have significantly lower fertility compared to non-migrants and highlights some differences in the factors associated with fertility of migrant women and non-migrant women. Education, wealth, age at first sex, ever use of family planning, ideal number of children, marital status and the co-wife status of the woman were the major factors associated with the fertility of migrants. On the other hand, the fertility of the non-migrants was associated with education, place of residence, wealth quintile, working status, age at first sex, pregnancy termination, use of family planning, ever use of family planning, exposure to family planning messages, ideal number of children, marital status and co-wife status of the woman. Place of residence, working status and exposure to family planning messages were only significant for the non-migrant group. The decomposition results indicate that slightly more than half (51%) of the difference in fertility of migrants and non-migrants was associated with the socioeconomic and demographic composition of migrant and non-migrant women while the remaining 49% is unexplained and can be attributed to the differences in the fertility behavior of the two groups of women. The major factors associated with the fertility difference were differences in composition

by; marital status, ideal number of children, ever use of family planning, education, wealth, current working status and co-wife status as well as the unexplained effects of; education, ever use of family planning, ideal number of children and co-wife status.

Continued improvements in access, attendance and completion of secondary schools by all women in Uganda presents a viable option to the reduction of the country's fertility levels. Our findings highlight the important role of family planning utilization in fertility transition. Efforts are needed to improve uptake of family planning methods (including traditional methods) by women and their partners. This calls for improved information, education and communication about family planning through appropriate mass media to influence changes in attitudes towards family planning, large family size preferences and other family and society norms.

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