Working Paper

A Contextual Analysis of Fertility in Uganda: The role of Physical Gender-Based Violence

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I. Background and Introduction

Fertility rates in sub-Saharan Africa have remained high and, in many countries such as Uganda, have stalled over the past several decades. Numerous authors have attempted to understand why this situation continues to occur, despite efforts by both researchers and policy-makers to increase development levels and education levels of women (Caldwell et al., 1992; Ezeh et al., 2009; Shapiro et al., 2009; Ainsworth, 1996; Caldwell et al., 1990; Goliber, 1985). Despite such efforts, fertility rates in the region are higher than anywhere else in the world (Ainsworth, 1996; Bongaarts et al., 2013; Bongaarts et al., 1984; Sinding, 2009). In Uganda, in particular, the TFR was 6.2 children per women in the 2011 Demographic and Health Survey (DHS) (UBOS & ICF, 2012). Studies have attempted to understand the persistently high fertility rates in Uganda (Blacker et al., 2005; Vavrus et al., 2003; Ntozi et al., 1997) - all with differential results. Population growth and continuously high fertility rates constrain development in the region. If fertility rates continue to remain at the high levels that are currently seen, there will be dire effects on the economic and social development in the sub-Saharan African region (Ainsworth, 1996; Sinding, 2009). It is therefore of critical importance to investigate the possible relationships between factors, hitherto uninvestigated, that could explain the continuously high fertility rate in Uganda, given the lack of consensus found to date. Given the lack of concurrence in results and the continuing stall in fertility rates, Potts et al. (2001) stated that there is a need to further explore the underlying (or indirect) reasons for fertility-related decisions and outcomes in the region, rather than a sole focus on the general (or direct) causes that could lower fertility. One such potential underlying factor that could be contributing to the persistently high fertility rates in Uganda is the high prevalence of Gender-Based Violence (GBV) in the country.

GBV is not only the physical act of violence but results in severe psychological, sexual and reproductive health outcomes as well, and emanates from pervasive forms of patriarchal beliefs and, in some situations, a lack of women's empowerment. GBV, globally, has been found to be on average 30%, whereas there are some regions that record levels as high as 38% or more. Women who have been abused by their partner also have a higher likelihood of reporting other health problems, as well as reporting lower birth weight babies. However, these global figures mask variations between communities, districts, countries and regions (WHO, 2013). Africa has the second highest prevalence of GBV (36.6%), preceded only by East Asia which has a prevalence of only 1% higher (WHO, 2013). Furthermore, most sub-Saharan African countries have a high tolerance for violence against women, including Uganda. A multi-country study of sub-Saharan Africa found that there was a very high acceptability of violence against women by both men and women when women transgressed social norms – such as going out without the husband's consent (Uthman et al., 2009). In Tanzania, one study found that women had a higher likelihood of GBV if they had not borne any children or if they had borne five or more children, as well as if the women were of a lower educational status (as found in other studies elsewhere in the world), or did not contribute to household living expenses (McCloskey et al., 2005). In Uganda GBV has been found to be as high as between 47% and over 50%, depending on the study, amongst married women (Speizer, 2012; Ogland et al., 2014). In the 2011 UDHS, lifetime physical GBV was reported by 56% of women in Uganda (UBOS & ICF, 2012).

One study has attempted to investigate whether GBV acts as a proximate determinant of fertility (Odimegwu et al., 2015). These authors concluded that an association between GBV and fertility was evident from their results. However, the study itself includes few socio-demographic factors and provides only a hypothetical description as to why and how the relationship between GBV and fertility works. Although not included in their analysis, the authors conclude that the hypothesised relationship is premised on the fact "that women who experience (GBV) are less likely to use modern contraceptives" (Odimegwu et al., 2015), and yet modern contraceptive use

is not included in the analysis. Furthermore, the study does not include Uganda – a country with both persistently high fertility levels as well as high prevalence of GBV. Finally, the study conducted by Odimegwu and colleagues (2015) investigates the relationship between fertility and GBV at the individual level only. However, many studies have found that investigation of fertility rates cannot be explained at the individual level alone (United Nations, 1990). Fertility in any country is best understood, therefore, by investigating its relationship with individual and contextual factors. Existing studies focus on traditional determinants of fertility as identified in Bongaarts' seminal work (Bongaarts et al., 1984). However, policy manipulations of these factors have failed to affect fertility. The need now arises to identify and examine other potential factors that could be important determinants of fertility – such as GBV. Therefore, the aim of this paper is to investigate the individual and contextual factors that affect fertility but with a specific focus on the role of physical GBV.

II. Literature Review and Hypothesis

In general, sub-Saharan Africa has seen only moderate decreases in fertility which are attributed to many direct (or proximate) and indirect (socio-economic and demographic factors that influence fertility due to their changes on proximate determinants) determinants (Johnson et al., 2011). Improvement in the status and empowerment of women has been found to have a positive effect on fertility decline (Kulkarni et al., 2013; Upadhyay et al., 2010; Abadian, 1996). However, the most widely studied determinant is the effect of education on fertility (Bongaarts, 2010; Drèze et al., 2001; Cochrane, 1979; Tavares, 2010; Fielding et al., 2009; Dreze et al., 2000; Caldwell, 1980; Martin, 1995; Rindfuss et al., 1980; Kravdal et al., 2008; Becker et al., 2010; Diamond et al., 1999; Martin et al., 1995; Basu, 2002). However, it is not education in and of itself that affects fertility. According to Bongaarts (2010), education's effect on fertility works on five types of autonomy amongst women – that of knowledge, decision-making, physical, emotional, and economic and social autonomies. Other authors state that the way in which the effect of education works is that education improves women's status and thus their bargaining power, providing them with new aspirations that could lead to them wanting smaller families to pursue such aspirations, and provides them with knowledge regarding modern contraception (Potts et al., 2001; Smith, 2004). Martin (1995) also found that education can increase women's reproductive choices, even though the relationship is not linear with actual fertility rates, and thus other factors need to be brought into account. Such mediating factors may have an influence on the proximate determinants of fertility. In this paper, GBV is hypothesised to be one such mediating factor.

Studies have also found that the strength of the association between indirect determinants and fertility is dependent on the level of socio-economic development in the country, on social structure and the cultural context (Martin, 1995). It is now widely acknowledged that levels of fertility are not only a product of biological factors, but of cultural factors and socio-demographic factors as well (United Nations, 1990). For instance, some studies have found that it is community education that is the greatest predictor of whether fertility rates in an area decline (United Nations, 1990; Kravdal, 2002); hence, the importance of investigating fertility using multi-level techniques. However, these studies also find differences between countries in the magnitude of this relationship – one suggested reason for these differences is the status of women in society.

Studies have also found stark differences between fertility rates in urban and rural areas within and between countries (Machiyama, 2010). Urbanisation has been found to be a key

determinant of decreasing fertility rates in the more industrialised countries since studies of the fertility transition began, results regarding low fertility rates and urbanisation in African countries, however, have been mixed. Dzegede (1981) believes that this is less about the process of modernisation, and that it could be very specific socio-cultural differences between rural and urban groups within countries that may explain differences in fertility rates between these areas. This includes differences in religiosity and traditional behaviours, differences in educational achievement of the community, migration rates, the difference in age of marriage, differentials in contraceptive use and health more generally, and the general socio-economic status of the area (Dzegede, 1981). Urban and well-educated women in the more developed African countries are more likely to use contraception or to delay marriage, and they are therefore also more likely to experience fertility declines (Bongaarts et al., 1984). In fact, studies have found that fertility rates in many African countries began to decline in urban areas as much as 10 years before they started to decline in rural areas. The reasons provided for this is that big cities provide access to modern roles and behaviours, modern health care and contraceptive use (Garenne et al., 2002).

Uganda has the second highest TFR (6.2) in Africa, preceded only by Niger (Lesthaeghe, 2014). Although fertility in Uganda remains high, studies on the determinants and factors that may be contributing to this within the country remain scant. Most of the work found regarding fertility in Uganda is viz-a-viz the country's fertility rates given the HIV epidemic in the country. These studies have found that fertility rates are higher amongst non-infected woman than for their infected counterparts which have contributed to a marginal decrease in the national fertility rates – although HIV prevalence rates have improved in the country over the past decade (Carpenter et al., 1997; Heys et al., 2009). Studies show that there is currently a very high unmet need for contraception in Uganda, and that women in general still want more children than women in other African countries (Blacker et al., 2005). Another study, with a qualitative design, reported study participants stated that they had experienced barriers to accessing contraceptives – specifically, fears and misconceptions regarding contraceptives and gender power relations. Some respondents noted that they would often be abused by partners if they had asked whether they could get contraception (Nalwadda et al, 2010). Another determinant of high fertility that has been found in studies conducted in Uganda was the level of schooling that a female had received (Vavrus et al., 2003; Bbaale et al., 2011); as are living in a poor household, limited access to family planning services and living in a rural area. This is even though us of modern contraceptive methods in Uganda has been found to decrease the number of children ever born to a woman (Bbaale et al., 2011).

Only one study has attempted to look at the relationship between GBV and fertility. Odimegwu et al. (2015) conducted analyses from three sub-Saharan African countries, assessing whether GBV acted as a proximate determinant of fertility. The authors' conclusions were that GBV was in fact an unexplained proximate determinant of fertility, at least in sub-Saharan Africa. However, given the review of literature – it is more probable that GBV is a moderator factor that can act to either increase or decrease contraceptive use – which is a proximate factor of fertility. A small number of studies in which GBV's association with unintended pregnancies, low contraceptive use, and pregnancy-promoting behaviours have also been conducted. One study from Colombia looked at the effect that GBV has on unintended pregnancy (used as a proxy measure for fertility control). In this study researchers found that women were at a much higher risk of experiencing an unintended pregnancy, if they had been physically abused – although results were not uniform across the country (Pallitto et al., 2004). The same authors conducted a meta-review of literature finding links between GBV and unintended pregnancy, postulating that women in abusive relationships have a limited ability to control their fertility (Pallitto et al., 2005b). Furthermore, in a multilevel analysis it was found that women living in districts with high patriarchal control had an increased risk of experiencing GBV, as well as of unintended pregnancy

(Pallitto et al., 2005a). In a qualitative study, conducted in the United States, researchers found that 74% of the 71 women interviewed stated that their reproductive decisions had been controlled by their partners, resulting in pregnancy-promoting behaviours (Moore et al., 2010). Furthermore, in the Philippines, it was found that women who were in relationships where men dominated decision-making had an increased risk of experiencing GBV in the home (Hindin et al., 2002). Gee et al. (2009) report the results of their study, which examined the association between the incidences of GBV with contraceptive use. These authors found that women whom had reported experiencing GBV also reported a higher number of pregnancies, generally. Their conclusion was that women may not able to negotiate other pregnancy prevention measures, such as contraceptive use. Furthermore, in their study, women who experienced GBV were also less likely to report using any form of birth control measures.

The hypothesis posited in this study, therefore, is that GBV modifies the beneficial gains associated with contraceptive use, educational status, increased age at first cohabitation, and women involvement in decision-making (used as a proxy of women's empowerment), and therefore increases fertility levels even in situations where gains in these factors have been noticeable.

III. Data and Methods

1. Data

This paper uses data from the 2011 Ugandan Demographic and Health Survey (UDHS). The DHS are nationally representative surveys conducted in over 85 middle and low-income countries around the world. For most countries, numerous DHS rounds have been conducted, and for Uganda the survey was conducted in 1989, 1995, 2000, and 2006. The 2011 UDHS is the last available survey conducted in the country. The DHS, in general, collects a high number of indicators on population, health and nutrition; and cover a broad array of topics including (but not limited to) family planning, fertility and fertility preferences, unmet need, and women's empowerment. Furthermore, the DHS includes a Domestic Violence module for several sub-Saharan African countries, namely Burkina Faso, Cote D'Ivoire, Ghana, Liberia, Mali, Nigeria, Kenya, Malawi, Rwanda, Tanzania, Zambia, Zimbabwe, Cameroon, Democratic Republic of Congo, Sao Tome and Principe, South Africa, and Uganda (UBOS & ICF, 2012).

The sampling frame used for the 2011 UDHS was selected using a two-stage process. The first stage selected 404 enumeration areas selected from a list of clusters that had been compiled for the 2009/10 National Household Survey. At the second stage, households within each cluster were purposively selected from a complete list of households – all households within the 404 enumeration areas were included in the 2011 UDHS. A representative sample of 10 086 households were included in the 2011 UDHS, and all women of reproductive age (15 to 49 years) who were permanent residents or visitors who slept in the household the night before were interviewed and included in the final dataset (UBOS & ICF, 2012).

In the UDHS the Household Questionnaire was used to list all the usual members and visitors of selected households. Some basic information was collected on the characteristics of each person listed, including his or her age, sex, education, and relationship to the head of the household. For children under age 18, survival status of the parents was determined. The data on age and sex obtained in the Household Questionnaire were used to identify women and men who were eligible for an individual interview. Additionally, the Household Questionnaire collected

information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor of the house, ownership of various durable goods, and ownership and use of mosquito nets (to assess the coverage of malaria prevention programmes). The Woman's Questionnaire was used to collect information from all women age 15-49 (UBOS & ICF, 2012).

For the purposes of this paper, to extract all required variables, the individual recodes (women's questionnaire) and household recode (household questionnaire) datasets were merged. Therefore, the study was a cross-sectional study that used secondary datasets from the Ugandan Demographic and Health Survey (UDHS). Adult women of reproductive ages (15-49) that were included in the domestic violence module, were included in this study.

2. Variables

The main outcome analysed in this paper was fertility. The main outcome variable was selected to assess lifetime or past fertility, is known as Children Ever Born (CEB). CEB is a count variable and a measure of cumulative fertility, and is easily calculated from census or survey data which ask women how many children she has borne. CEB is used primarily for retrospective comparisons, and because it does not include any control for age or for cohort differences in fertility, it is not a good measure of overall fertility if fertility has changed considerably over time (United Nations, 2013). In Uganda fertility has remained high and constant over the last several decades.

The main independent outcome of interest in this paper was GBV. The variables for GBV come from a special module that is added onto the standard DHS questionnaire, and is known as the domestic violence module. This module contains several questions related to the topic of domestic violence. For this module, information was collected on violence experienced by the women by her partner since her 15th birthday, amongst others. Questions were asked about physical, sexual and emotional abuse experienced; although physical GBV was separated into less severe and more severe physical GBV (UBOS & ICF, 2012). For the purposes of this paper, the analyses were restricted to physical GBV. Given that the consequences of less and more severe physical GBV differ, for the purposes of this study these variables remained as is (less and mode severe GBV) to assess whether the factors that contribute to their prevalence differ as well. Less and more severe physical GBV are defined according to the definition used by the DHS. Therefore, more severe GBV includes whether a woman had ever been kicked / dragged, strangled / burned, threatened with knife / gun / another weapon (1) or not (0). On other other hand, less severe physical GBV includes whether a woman had ever been pushed, shook, or had something thrown at them; slapped; punched; twisted / hair pulled by husband / partner (1) or not (0).

The remaining individual and contextual variables used in the analysis were derived from past literatures, and the hypothesised conceptual model. At the individual level these included highest educational level attained, wife's decision-making involvement, and age at first cohabitation. At the contextual level, these included region of residence, place of residence, community level of maternal education and community attitude to wife-beating. Finally, the proximate factor is current use of contraception. Table 1 below shows the coding used for each of the factors included in the analysis.

Table 1: Individual and Contextual Level Proximate Determinants

Individual-Level Factors	
Name of Variable	**Definition of Variable**
1. Ever experienced severe physical Domestic Violence: *Kicked / dragged, strangled / burned, threatened with knife / gun / another weapon*	No (0), Yes (1)
2. Ever experienced less severe physical Domestic Violence: *Pushed, shook, or had something thrown at them; slapped; punched; twisted / hair pulled by husband / partner*	No (0), Yes (1)
3. Highest educational level	None (0), Primary (1), Secondary (2), Higher than secondary (3)
4. Wife's Decision-Making Involvement	Wife involved in Decision Making (either solely or partially) (1), Wife not involved in Decision-Making at all (2) *Created using a composite index of 3 variables derived from the UDHS – women involved in decision-making for (a) visiting friends and family (b) large household purchases (c) decisions on own (woman's) health care. Women involved in any of these decisions were coded as 1, women involved in none of these decisions were coded as 2.*
5. Age at First Cohabitation	Below age 15 (1), 15-19 (2), 20-24 (3), 25 years and above (4)
Contextual-Level Factors	
Name of Variable	**Definition of Variable**
1. Region of residence	Kampala (1), Central 1 (2), Central 2 (3), East Central (4), Eastern (5), North (6), Karamoja (7), West Nile (8), Western (9), Southwest (1)
2. Type of place of residence	Urban (1), Rural (2)
3. Community maternal level of education – proportion of women with at least secondary education	Low (1), Medium (2), High (3)
4. Community Attitude to Wife-Beating	Low (1), Medium (2), High (3)
Proximate Factor	
Name of Variable	**Definition of Variable**
1. Current use of contraception	No Use of Any Method (0), Modern Methods Used (1), Traditional Methods Used (2)

3. Analysis Methods

First and foremost, fertility differentials (mean CEB) are shown according to contraceptive use and socio-demographic factors, but by severity of physical GBV. This was used to assess the differences in patterns and differentials amongst those who had or had not ever experienced each form of GBV. Unadjusted Poisson results look at the relationship between CEB with each severity of physical GBV, the individual and contextual factors, and contraceptive use. This is followed by the Poisson multilevel analysis.

Multilevel modelling, in general, allows one to study effects that vary by group, and allows one to estimate such interactions. Furthermore, by using multi-level modelling the study will also be able to estimate group averages and group-level effects on fertility and GBV; and allows us to provide a simultaneous model that incorporates both individual level and group level models (Gelman et al., 2007). The random and fixed effects are shown and interpreted for both the sets of models for each of the fertility outcomes. The random effects are the variation measures, which account for variations in fertility across communities. The fixed effects, on the other hand, show the measures of association and are expressed as IRRs, significant at the 0,05 level of significance.

On the other hand, the random effects were shown as the variance partition coefficient (VPC), which equates to the inter-class correlation and the percentage change in variance (PCV). The larger the value of the VPC, the more important is the community level factors in explaining variations in fertility. On the other hand, the PCV is calculated relative to the community variance within the reference model (Antai, 2011; De Wet, 2013; Twisk, 2006). Diagnostically, the Akaike Information Criterion (AIK) and the Bayesian Information Criterion (BIC) are used to determine the goodness of fit (Uthman et al., 2008). The model with the lowest AIC and BIC are said to be the best fit model (Uthman et al., 2008). In total 3 models were created. The first models included no GBV, whilst the second and third model included less severe and more severe physical GBV, respectively.

Results for the unadjusted Poisson regression and the Multi-level Poisson models are presented as Incidence Risk Ratios (IRR).

IV. Results

1. Fertility Differentials amongst Ugandan Women of Reproductive Age by Severity of Physical GBV

Amongst almost all the factors of interest, women who had experienced physical GBV had higher mean CEB than their counterparts who did not experience less severe physical GBV (Table 2) or more severe physical GBV (Table 3). The few exceptions amongst those whom had experienced less severe physical GBV included women who had a higher than secondary level of schooling (1.63) and who lived in urban areas (3.11), compared to 2.42 and 3.15 CEB amongst their counterparts who had not experienced less severe physical GBV, respectively.

Table 2: Fertility Differentials of Ugandan Women of Reproductive Age by Less Severe Physical GBV [UDHS, 2011]

Less Severe Physical GBV	**Mean CEB**	
	No	**Yes**
Current Contraceptive Use		
No Method	3.71	4.57
Traditional Method	4.41	6.62
Modern Method	4.33	4.67
Highest Education Level		
No education	5.62	6.47
Primary	4.03	4.52
Secondary	2.81	3.05
Higher	2.42	1.63
Age at First Cohabitation		
Under 15 Years	5.72	5.82
15-19 Years	3.78	4.34
20-24 Years	3.23	4.22
25 and Above	2.87	5.24
Household Decision-Making		
Women Not Involved in Decision-Making	3.00	3.91
Women Involved in Decision-Making	4.04	4.87
Region		
Kampala	2.57	2.63
Central 1	3.82	4.69

Central 2	4.31	5.26
East Central	4.52	5.01
Eastern	3.76	4.75
North	3.99	4.60
Karamoja	2.98	5.55
West-Nile	3.58	4.73
Western	4.48	4.50
Southwest	3.74	4.46
Place of Residence		
Urban	3.15	3.11
Rural	4.07	4.85
Community Level of Female Education		
Low	3.97	4.94
Medium	4.33	4.68
High	3.35	3.75
Community Level of Attitude to Wife-Beating		
Low	3.66	4.48
Medium	4.06	4.69
High	3.98	4.74

The only two exceptions for more severe physical GBV were amongst women with higher than secondary educational level and women that were not involved in household decision-making. Amongst these groups of women, those that had experienced more severe physical GBV had lower mean CEB than those who did not experience this form of GBV (1.43 vs. 2.39 and 4.04 vs. 5.12, respectively).

Table 3: Fertility Differentials of Ugandan Women of Reproductive Age by More Severe Physical GBV [UDHS, 2011]

More Severe Physical GBV	**Mean CEB**	
	No	**Yes**
Current Contraceptive Use		
No Method	3.82	4.95
Traditional Method	4.70	7.34
Modern Method	4.40	4.64
Highest Education Level		
No education	5.74	6.64
Primary	4.12	4.64
Secondary	2.83	3.33
Higher	2.39	1.43
Age at First Cohabitation		
Under 15 Years	5.53	6.38
15-19 Years	3.88	4.53
20-24 Years	3.39	4.10
25 and Above	3.10	6.25
Household Decision-Making		
Women Not Involved in Decision-Making	5.12	4.04
Women Involved in Decision-Making	4.78	5.36
Region		
Kampala	2.50	3.59
Central 1	4.00	4.58
Central 2	4.44	5.31
East Central	4.60	5.20
Eastern	4.01	5.15
North	3.94	4.95
Karamoja	3.33	5.59
West-Nile	3.66	5.13
Western	4.40	4.85

Southwest	3.95	4.28
Place of Residence		
Urban	3.05	3.74
Rural	4.20	5.05
Community Level of Female Education		
Low	4.25	4.99
Medium	4.27	5.13
High	3.36	4.18
Community Level of Attitude to Wife-Beating		
Low	3.75	4.87
Medium	4.15	4.85
High	4.10	5.02

2. Unadjusted Associations

Table 4 shows the unadjusted relationship between children ever born with each severity of physical GBV, the current contraceptive use and all the socio-demographic factors. The average number of children was 21% (p<0.00; CI 1.16 – 1.27) and 25% (p<0.00; CI 1.19 – 1.32) higher among women who had experienced less severe physical GBV and more severe physical GBV, respectively. Those whom were on traditional and modern contraceptives had 38% (p<0.00; CI 1.21 – 1.57) and 22% (p<0.00; CI 1.16 – 1.29) more children than those who were on no contraceptives, respectively.

All the individual-level socio-demographic characteristics showed a significant relationship with children ever born as well. Children ever born decreases with each level of education achieved. Those women with a primary school level of education had 29% (p<0.00; CI 0.67 – 0.75) less children than women with no education, whilst those with secondary and higher than secondary has 60% (p<0.00; CI 0.37 – 0.43) and 72% (p<0.00; CI 0.24 – 0.33) less children.

The age at which a woman first cohabitates also shows a significant relationship with CEB, in that the lower the age at first cohabitation the higher the CEB. Those who first cohabitated between the ages of 15 and 19 years had 26% (p<0.00; CI 0.70 – 0.79) less children, compared to those who first cohabitated below the age of 15 years. Furthermore, those that cohabitated between the ages of 20 and 24 years, and those that were 25 years or older, had 35% (p<0.00; CI 0.61 – 0.70) and 41% (p<0.00; CI 0.52 – 0.67) less children those that cohabitate before the age of 15, respectively. Furthermore, household decision-making showed that women who were either solely or jointly involved in big household decisions had 20% (p<0.00; CI 1.11 – 1.28) more children than those who were not involved in household decisions at all.

Women residing in all regions had significantly more children than women living in the Kampala region. Women living in East Central and Karamoja regions had over 2 times more children than women living in Kampala. Women living in Central 1 and Central 2 had 75% (p<0.00; CI 1.55 – 1.98) and 98% (p<0.00; CI 1.76 – 2.22) more children, whilst those in Eastern and North regions had 93% p<0.00; CI 1.72 – 2.17) and 87% (p<0.00; CI 1.66 – 2.11) more children, respectively. Finally, whilst women living in West-Nile and Western region had 82% (p<0.00; CI 1.62 – 2.05) and 96% (p<0.00; CI 1.74 – 2.20) more children than women living in Kampala, respectively; women in Southwest region had 68% (p<0.00; CI 1.49 – 1.89) more children. Closely related, given that Kampala region is a predominantly urban area, women living in rural areas had 52% (p<0.00; CI 1.44 – 1.61) more children than women living in urban areas.

Women living in communities with medium and high percentages of women with a secondary or higher level of education had 11% (p<0.00; CI 0.85 – 0.94) and 38% (p<0.00; CI

0.58 – 0.66) less children than women living in communities where percentages were low. On the other hand, women living in communities with medium and high percentage of respondents with a favourable attitude to wife-beating had 15% (p<0.00; CI 1.09 – 1.22) and 16% (p<0.00; CI 1.10 – 1.23) more children than those where percentages were low.

Table 4: Unadjusted Incidence Risk Ratio of Children Ever Born [UDHS, 2011]

	Unadjusted Results		
	IRR	**95% CI**	**P-value**
Less Severe Physical GBV			
No	**RC**		
Yes	1.21	1.16 – 1.27	0.00
More Severe Physical GBV			
No	**RC**		
Yes	1.25	1.19 – 1.32	0.00
Current Contraceptive Use			
No Method	**RC**		
Traditional Method	1.38	1.21 – 1.57	0.00
Modern Method	1.22	1.16 – 1.29	0.00
Highest Education Level			
No education	**RC**		
Primary	0.71	0.67 – 0.75	0.00
Secondary	0.40	0.37 – 0.43	0.00
Higher	0.28	0.24 – 0.33	0.00
Age at First Cohabitation			
Under 15 Years	**RC**		
15-19 Years	0.74	0.70 – 0.79	0.00
20-24 Years	0.65	0.61 – 0.70	0.00
25 and Above	0.59	0.52 – 0.67	0.00
Household Decision-Making			
Women Not Involved in Decision-Making	**RC**		
Women Involved in Decision-Making	1.20	1.11 – 1.28	0.00
Region			
Kampala	**RC**		
Central 1	1.75	1.55 – 1.98	0.00
Central 2	1.98	1.76 – 2.22	0.00
East Central	2.15	1.92 – 2.42	0.00
Eastern	1.93	1.72 – 2.17	0.00
North	1.87	1.66 – 2.11	0.00
Karamoja	2.03	1.80 – 2.29	0.00
West-Nile	1.82	1.62 – 2.05	0.00
Western	1.96	1.74 – 2.20	0.00
Southwest	1.68	1.49 – 1.89	0.00
Place of Residence			
Urban	**RC**		
Rural	1.52	1.44 – 1.61	0.00
Community Level of Female Education			
Low	**RC**		
Medium	0.89	0.85 – 0.94	0.00
High	0.62	0.58 – 0.66	0.00
Community Level of Attitude to Wife-Beating			
Low	**RC**		
Medium	1.15	1.09 – 1.22	0.00
High	1.16	1.10 – 1.23	0.00

**=statistical significance p<0.05*

3. Individual-Level and Contextual-Level Effects on Fertility amongst Ugandan Women of Reproductive Age

Table 5 below shows the individual and contextual effects of fertility amongst Ugandan women of reproductive age. Model 1 of the multi-level models did not include any form of GBV (reference model), whilst model 2 included less severe physical GBV and model 3 included more severe physical GBV. In model 2, those who had experienced less severe physical GBV had 15% more children than women whom had never experienced less severe physical GBV. Model 3 shows similar results, in that those women who had experienced more severe physical GBV had 16% more CEB compared to those that had never experienced more severe physical GBV.

All the individual–level factors remained statistically significant in all three models. Education was found to statistically decrease CEB, irrespective of the model. Those with primary level education had 26% less CEB than women with no education in both model 1 and 2, and 25% less CEB in model 3. Furthermore, women with secondary level of education had 46% less CEB and women in higher than secondary education had 60% less CEB in model 1. In both model 2 and 3, however, these figures were 45% less CEB amongst those with secondary education and 59% less CEB for those with higher than secondary education.

Women who were involved in household decision-making had 23% more CEB in model 1 and 3, and 22% more CEB in model 2 compared to women who were not involved in household decision-making at all. Furthermore, women who were on modern contraceptives had 47% more CEB in model 1, and 46% more CEB in models 2 and 3; whilst those on traditional methods of contraception had 20% more children in models 1 and 2, and 19% more CEB in models 3 compared to women who were not on any form of contraception.

Age at first cohabitation also showed a significant relationship with CEB. Those whom had first cohabitated between the ages of 15 and 19 years had 21% less CEB in model 1, and 20% less CEB in models 2 and 3 compared to women who had first cohabitated below the age of 15. Ironically, however, women who first cohabitated at ages 20 to 24 years had 17% less CEB in model 1, and 16% less CEB in models 2 and 3 compared to those that first cohabitated below the age of 15 years. Finally, those that first cohabitated at age 25 or more had 23% less children in model 1, and 22% less children in models 2 and 3.

The only contextual factor to show some significance to CEB was the region in which women lived. However, Karamoja did not show any significant association with CEB in any of the models, whilst the North region was not significantly associated with CEB in models 2 and 3, and the West-Nile region in model 3. Women in Central 1 region had 35% more CEB in model 1, and 36% more children in models 2 and 3 than women living in Kampala. Model 1 shows that women in Central 2 region had 49% more CEB than women from Kampala, whilst this figure was 50% more CEB in model 2 and 48% more children in model 3. Women living in East Central region had 45% more CEB in model 1, and 44% more CEB in model 2 and 3. Women living in the Western region had 29% more CEB in model 1, and 28% in models 2 and 3. Similarly, women living in the Southwest region had 22% more CEB in model 1, and 21% more CEB in models 2 and 3. All compared to their counterparts living in the Kampala region. On other hand, those in the Eastern region showed slightly more variation between models. Women in this region in model 1 had 32% more CEB, whilst in model 2 and 3 they had 27% and 29% more CEB than their counterparts living in Kampala.

According to the AIC and BIC, models 2 and 3 show a slightly better fit than model 1 – given that both these values are lower in models 2 and 3 than in model 1. However, the difference in both the AIC and BIC between models 2 and 3 is marginal, although the values of model 2 (less severe physical GBV) show a slightly better fit than model 3 (more severe physical GBV). Furthermore, the VPC values are all relatively small in all three models (around 20% in each model) and do not vary significantly, showing the only a small variation of the effect on fertility can be explained by the contextual factors – and this does not change when physical GBV is taken into account. Finally, the explained variation differs between the reference model (or model 1) and model 2 by 4.41%, but only by 2.94% between model 1 and 3.

Table 5: Individual and Community Level Effects on Children Ever Born amongst Ugandan Women of Reproductive Age [UDHS, 2011]

Characteristics	Model 3A	Model 3B	Model 3C
	IRR	IRR	IRR
PHYSICAL GENDER-BASED VEIOLENCE			
Less Severe Physical DV			
No	**RC**	**RC**	**RC**
Yes		1.15*	
More Severe Physical DV			
No	**RC**	**RC**	**RC**
Yes			1.16*
INDIVIDUAL / HOUSEHOLD LEVEL FACTORS			
Highest Education Level			
No education	**RC**	**RC**	**RC**
Primary	0.74*	0.74*	0.75*
Secondary	0.54*	0.55*	0.55*
Higher	0.40*	0.41*	0.41*
Household Decision-Making			
Wife Not Involved in Decision-Making	**RC**	**RC**	**RC**
Wife Involved in Decision-Making	1.23*	1.22*	1.23*
Age at First Cohabitation			
Under 15 Years	**RC**	**RC**	**RC**
15-19 Years	0.79*	0.80*	0.80*
20-24 Years	0.83*	0.84*	0.84*
25 and Above	0.77*	0.78*	0.78*
Current Contraceptive Method			
No contraceptive method	**RC**	**RC**	**RC**
Modern methods	1.47*	1.46*	1.46*
Traditional methods	1.20*	1.20*	1.19*
COMMUNITY-LEVEL FACTORS			
Region			
Kampala	**RC**	**RC**	**RC**
Central 1	1.35*	1.36*	1.35*
Central 2	1.49*	1.50*	1.48*
East Central	1.45*	1.44*	1.44*
Eastern	1.32*	1.27*	1.29*
North	1.21*	1.17	1.16
Karamoja	1.09	1.09	1.07
West-Nile	1.24*	1.22*	1.20
Western	1.29*	1.28*	1.28*
Southwest	1.22*	1.21*	1.21*
Place of Residence			
Urban	**RC**	**RC**	**RC**
Rural	1.11	1.11	1.11
Community Level of Maternal Education			

Low	**RC**	**RC**	**RC**
Medium	1.01	1.02	1.01
High	0.94	0.95	0.95
Community Level of Attitude to Wife-Beating			
Low	**RC**	**RC**	**RC**
Medium	1.00	1.00	0.97
High	1.00	0.99	0.99
Random Effects Parameters	**Model 3A**	**Model 3B**	**Model 3C**
Community Level			
Variance (SE)	1.36 (0.19)*	1.30 (0.10)*	1.32 (0.10)*
VPC = ICC (%)	20.81	20.84	20.74
Explained Variation (PCV) (%)	Reference	4.41	2.94
Log-Likelihood			
Log-Likelihood	-3317.87	-3302.42	-3302.46
Model Fit Statistics			
AIC	6685.75	6656.84	6656.93
BIC	6817.66	6793.99	6794.06

**=statistical significance p<0.05*

V. Discussion, Conclusion and Implications

Uganda has one of the highest fertility rates and GBV prevalence rates in the world. Fertility rates have stalled for more than 2 decades, and have no sign of decreasing in the near future. Numerous studies have been conducted in the past in an attempt to provide explanations as to why; despite concerted efforts from researchers, governments and other stakeholders these efforts have not resulted in a decrease in fertility in many sub-Saharan African countries. Studies and national programmes alike have had differential results, and therefore there is a need to investigate new factors that could be contributing to the stall of fertility in these countries. GBV has numerous negative health outcomes, including but not limited to, some severe sexual and reproductive health outcomes for the women who experience GBV. Studies have found that GBV also contributes to a decrease in contraceptive use and an increase in unintended pregnancies. However, only one study has attempted to see whether such a relationship contributes to an increased level of fertility. As with the study by Odimegwu et al. (2015), this study finds that there is in fact an association between GBV and fertility. This is even after controlling for factors which have been found in the literature to both affect fertility rates as well as prevalence of GBV; including educational status, age at first cohabitation, and household decision-making. This combination of factors works together to show the autonomy and empowerment that women have (or do not have) within the relationship.

Therefore, the results from this study suggest that fertility cannot be investigated without incorporating factors of not only women's empowerment, but whether women experience GBV. Women who experience both less and more severe GBV have elevated CEB. The unadjusted results show that women who experience less severe physical GBV have 21% higher CEB than those who do not ever experience it, whilst those that experience more severe physical GBV have 25% more CEB. In the multi-level models, which adjust for all the factors shown to be both important in understanding elevated fertility rates as well as higher prevalence of GBV in previous studies, shows that those that experience less severe physical GBV have 15% more CEB and those who experience more severe GBV have 16% more CEB than those that have never experienced physical GBV. GBV has been found to decrease the use of contraceptives (Pallitto et al., 2004; Pallitto et al., 2005b; Pallitto et al., 2005a; Moore et al., 2010; Hindin et al., 2002; Gee et al., 2009), however it could very well also decrease their effectiveness if, due to the psychological or

severe physical trauma, women may either not be able to fetch contraceptives from the clinic or forget to take the contraception as prescribed. This further reduces the effectiveness of the contraception, and leads to unintended pregnancies.

However, unlike what has been found in previous studies – women in Uganda who are currently on contraception (whether modern or traditional) have more CEB than those that are not currently on contraceptive methods. In general contraceptive use in sub-Saharan Africa has been increasing. However, the results of this study concur with a multi-country study conducted in 2011 by Johnson and colleagues which found that in some countries even an increase in contraceptive use did not equate to fertility levels being low. In the current study, women whom were on no form of contraception had lower fertility than those on either modern or traditional forms of contraception. Furthermore, if a woman experienced less or more severe physical GBV, the mean CEBs were even higher – irrespective of whether the women were on no form, modern forms or traditional forms of contraception. This concurs with Johnson and colleagues' 2011 study which showed that even countries with modest increases in contraceptive use, this use may not have been consistent and would decrease their effectiveness – shown by the high levels of mistimed and unwanted pregnancies (Johnson et al., 2011). If used correctly the contraceptive pill, injection, intrauterine device, condom / diaphragm, female sterilisation and periodic abstinence all help decrease fertility rates in a country (Ijaiya et al., 2009). However, given the nature of the study design (cross-sectional) and the fact that causal pathways cannot be established, it is very likely that women who are on contraception have done so because they are either trying to limit their births or cease fertility altogether because they have already had the desired (or more) number of children. A longitudinal study would allow for these pathways to be investigated, to assess the order of events. Furthermore, qualitative research is required in order to provide more detailed information regarding how these events take place, and assess the psychological and emotional repercussions of the abusive acts and the consequence this has on women access to family planning, consistency of use of contraception, and short and medium-term recall or memory.

Education and age at first cohabitation are shown to depress fertility rates. Results show that the higher the women's education and age at first cohabitation, the lower the number of children ever born. These results concur with the results of numerous studies, and the effects of older age at first cohabitation and higher education levels on fertility is well known (Caldwell et al., 1992; Ezeh et al., 2009; Shapiro et al., 2009; Ainsworth, 1996; Caldwell et al., 1990; Goliber, 1985; Bongaarts, 2010; Drèze et al., 2001; Cochrane, 1979; Tavares, 2010; Fielding et al., 2009; Dreze et al., 2000; Caldwell, 1980; Martin, 1995; Rindfuss et al., 1980; Kravdal et al., 2008; Becker et al., 2010; Diamond et al., 1999; Martin et al., 1995; Basu, 2002; Dzegede, 1981). However, amongst women who have experienced both less and more severe physical GBV, the gains of education and higher education levels are somewhat eroded, given that their mean CEBs are drastically higher than those who have not experienced physical GBV. Uganda has an extremely high number of women who marry or first cohabitate before the age of 18, and some as young as before the age of 15 years (UNICEF, 2016). The link between age at first cohabitation, education, GBV and fertility is evident. Women who marry at young ages are not able to complete their education, and are often not provided the social resources to be able to have the negotiating power to argue for a smaller family size, subsequent use of contraception, and are also less autonomous than those who have been able to complete their education. However, if these social benefits are eroded with the incidence of physically abusive acts, and even exacerbate fertility rates amongst those whom are young at first cohabitation and have low levels of educational attainment, programmes and policies cannot address women's fertility desires and autonomy by simply increasing educational levels and making young age at first cohabitation illegal. Such policies and programmes need to work commensurately and actively to address issues of violence

and abuse within the household, and by other members of society. The value and importance in addressing GBV for health reasons has been well established, but the importance of addressing GBV to assure that benefits from other social factors that increase women's autonomy and decrease fertility is now shown as well.

Unlike what has been found in previous studies, however, is that in Uganda contextual factors do not seem to explain a large proportion of the variation in fertility. This, however, could be that generally Ugandan women and society at large place a high cultural value on large families and high numbers of children. Ntozi et al (1997) found that Ugandan women desired around 7.8 children, whilst their husbands desired 8.9 children; concluding that a large family was still an acceptable cultural and social norm amongst Ugandans in general. This, however, differed between rural and urban dwellers, and those of different ethnic groups (Ntozi et al., 1997). This explains both the higher CEB amongst those that are solely or partially involved in household decision-making, as well as the fact that the contextual factors did not explain much of the variation in fertility. The only contextual factor found to remain significantly associated with fertility levels was region. It has been found in other studies that regional differences often reflect a myriad of factors, including access to family planning services and cultural practices in the area that may elevate or depress fertility levels (Bongaarts, 2017). It is critical for researchers and policy-makers to work together to create viable programmes in which key services and behaviour change communication are provided for in one coherent model Increasing educational levels of women and women's empowerment, and national level efforts to increase the age at first cohabitation cannot be done in silos. As this study has shown, the benefit of one of these acts may be eroded by the incidence of GBV. Increased educational attainment and higher age at first cohabitation may not reach the desired affect is levels of physical GBV remain high.

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