

Original Research Paper

Access to and Uptake of Contraception by Women with Disabilities

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Abstract: Contraception has been identified as an imperative for achieving the Sustainable Development Goals. In poor countries, the need for contraception is highest among the most vulnerable population groups. One such group is women with disabilities. The objectives of this study were to examine uptake of and identify the predictors of use of contraception by women in Uganda with disabilities. The study used cross-sectional data on 1128 sexually experienced women in the 15-49 year age group with disabilities. The data were obtained from the 2011 Uganda Demographic and Health Survey. The binary logistic regression model was used to analyse the data. The study found that only 26.1% of the women had ever used contraception and the results confirmed the hypothesis that access to health facilities and access to family planning information on radio significantly increased uptake of contraception. Other factors that significantly increased uptake of contraception were attending 4 or more Antenatal Care (ANC) visits, being in the 25-34 year age group, living in Kampala region, having primary, secondary or higher education, being in the middle or richer wealth index groups and having almost daily access to radio. We conclude that uptake of contraception by women with disabilities is low and reflects the high unmet need for contraception for women in Uganda, which could be explained by the pervasive structural inequalities in access to contraception services.

Keywords: Family Planning, Maternal Health, Disability, Media

Introduction

Access to and uptake of contraception is important for achieving the recently launched Sustainable Development Goals (SDGs). Contraception can contribute to reducing chronic poverty and hunger, increasing access to quality education, enhancing gender equality, improving maternal health and reducing childhood mortality through its role in preventing unwanted pregnancy and reducing fertility rate (Cates Jr, 2010). It can also contribute to the sustainable use of environmental resources, reduce the pace of climate change (Haq *et al.*, 2010) and the frequency and severity of conflicts around the world (Galati, 2015) by reducing the level of competition for resources induced by population growth (Ujoh, 2014).

In poor countries, the need for contraception is greatest among population groups at the highest risk of health and socioeconomic vulnerabilities because of their reduced capacity to cope, respond to and counter livelihood shocks. One such group is women with disabilities. Disability has been defined in various ways,

but generally refers to any condition that prevents a person from living a normal social and working life. It is characterized by impairment in body functions; limitations in executing tasks; and restrictions in involvement in life situations (WHO, 2011). Disabilities can take several dimensions including physical, cognitive, mental and developmental, or a combination of two or more of these. It can occur at birth or be acquired at any stage during the life course (Low and Pistaferri, 2010). Disability is also a manifestation of the interaction between a person and features of the society in which he/she lives (Tuomilehto and Wareham, 2002).

Irrespective of the form or stage at which a disability occurs, it is a serious cause of exclusion of people directly affected by it and/or their families not only because it carries negative and derogative connotations in many societies, but also because it can significantly affect individual and family economic and social functions for a long time. For example, among the Shona of Zimbabwe, disability was regarded as a state of being less human (Charlton, 2000); in some societies in Asia,

having a disability was regarded as a punishment from God for sins committed by the individual with a disability or his/her parent(s) (Eisland, 1994); and in Uganda it was regarded as a curse locally known as “*Kisirani*” (Lwanga-Ntale, 2003). Economically and socially, many individuals with disabilities and their families are poorer and often excluded from vital services because disability affects their finances, career, opportunities, how they allocation their time as well as their health (Chakravarti, 2008; Richard, 2014). As a result, persons with disabilities have various vulnerabilities. For example, they have poorer access to health, education, economic opportunities and often live in poverty. The lower income countries, mostly in sub-Saharan Africa, have a higher burden and impact of disabilities from various causes than anywhere else in the world. In these countries women are disproportionately more affected than men by disabilities and their impacts (Mitra *et al.*, 2013; Naami, 2015).

Disabilities and Reproductive Health Services

Disability is one of the major obstacles to uptake of reproductive health services in sub-Saharan Africa because persons having disabilities are perceived to be asexual and unlikely to marry or bear children (Ahumuza *et al.*, 2014; Ganle *et al.*, 2016; Lang, 2009). One of the least used reproductive health care services by women with disabilities in these societies is contraception (Ganle *et al.*, 2016; Kaplan, 2006). This situation is attributed to the structural barriers of poor access to health facilities in rural areas where most women with disabilities live and systemic barriers exacerbated by the poor attitude of health workers to the reproductive health needs of women with disabilities (Barriga and Kwon, 2010; Hamid and Stephenson, 2006). Pervasive discrimination against women with disabilities in matters related to sexuality, fuelled by the perception that they do not need contraception because they are asexual (Ahumuza *et al.*, 2014) and their inadequate knowledge contributes to the low uptake of reproductive health services (Thomas, 2004; Trani *et al.*, 2011). Despite having a national policy on disability and the Persons with Disabilities Act, many women in Uganda with disabilities face many barriers in accessing reproductive health services including contraception (Thomas, 2004). As a result, the unmet need for family planning, which is the number of women who would like to space, limit or stop childbearing, but lack access to methods for doing so, is high among women with disabilities (Ahumuza *et al.*, 2014).

Problem Statement

The literature from developed countries shows that there has been significant progress in addressing the reproductive health needs of women with disabilities (Leigh *et al.*, 2004; WHO, 2011). However, there is a paucity of knowledge on the reproductive health of

women with disabilities in low income countries, especially those in sub-Saharan Africa where the burden of disability is high. The few small area studies on the reproductive health of women with disabilities in sub-Saharan Africa suggest that compared to normal women, women with disabilities are neglected and excluded from contraception (Ahumuza *et al.*, 2014; Ganle *et al.*, 2016). As a result, they remain at high risk of unwanted and mistimed pregnancies and are exposed to health and socioeconomic vulnerabilities associated with childbearing as they cannot cope or respond effectively to the limitations and incapacities imposed on them by disability. We are also not aware of any studies using nationally representative data on disabilities and contraception in Uganda that examined the barriers faced by women with disabilities in using contraception. As a result the predisposing and enabling factors that affect the uptake of contraception by women with disabilities in Uganda have remained unknown. The objectives of the study were therefore to assess the national prevalence of and identify the predictors of uptake of contraception in Uganda by women with disabilities.

The study used the Andersen’s Behavioural Model for Health Services Use (Babitsch *et al.*, 2012) to identify predictors of uptake of contraception by women with disabilities. We propose that uptake of contraception is influenced by the combination of predisposing, enabling and needs factors. The predisposing factors operate at an individual level to influence the need for contraception and they include age, marital status and education. Enabling factors are those that facilitate uptake of contraception including access to health facilities, access to family planning information, wealth status of women, place and region of residence and husband’s level of education. Factors that influence the need for contraception included in the study were knowledge of contraception, number of surviving children, fertility intentions of women and husband’s/partner’s number of children desired.

Materials and Methods

Data and Sample

The study used cross-sectional data on 8740 women within the reproductive ages of 15-49. The data were obtained from the Uganda Demographic and Health Survey (UDHS), which was conducted by the Uganda Bureau of Statistics (UBOS) and ICF International in 2011. The survey collected data on demographic, socioeconomic, reproduction, contraception, sexual and reproductive health, nutrition, HIV and AIDS and gender based violence characteristics of the women.

The sample for the survey was nationally representative and was drawn by the use of a two stage cluster sampling design. In the first stage 404 enumeration areas distributed all over Uganda (EAs) were selected as clusters from a sample frame developed from the 2002

Uganda population and household census. The second stage comprised the selection of 10086 households from the selected EAs. From the households, all women aged 15-49 years who resided in the households and those who visited and stayed the preceding night in the household were interviewed. The interviews were conducted by trained research assistants with previous research experience using the face to face method. A standard and structured woman's questionnaire designed by the Measure DHS programme to collect data from 91 developing countries was used to collect the data from the women. The questionnaire used to collect the data was translated from English to the local languages in the different regions.

Disability status and ever given birth were the eligibility criteria for inclusion of the women in the study. In this regard women with any form of disability including any condition which moderately, severely or completely impaired sight, hearing, walking, remembering or communication, or two or more of the above conditions were included in the study. To ensure robustness of the sample, an aggregate variable called disability status was created. This variable had two categories, namely having disabilities and having no disabilities. The category having disabilities was then used to select the 1128 records analysed.

Ethical approval for the study was obtained from the Institutional Review Board of UBOS. Before collecting data, informed consent was obtained from respondents after explaining to them the purpose and objectives of the survey. The respondents were also informed of their right to withdraw from the survey or decline answering questions they were not comfortable with. Interviews were conducted in private, confidentially and anonymously. Permission to use the data in this study was obtained from UBOS.

The Dependent and Independent Variables

In this study, the dependent variable was uptake of contraception, which included ever use of any hormonal, surgical or barrier methods for the purpose of regulating fertility. A woman with a disability who reported ever using any of the above methods was regarded as having used contraception. The independent variables comprised of predisposing, enabling and contraceptive needs variables. The predisposing variables included age groups categorized as <25, 25-34 and 35 years or older; level of education categorized as uneducated, primary, secondary or tertiary education. Another predisposing variable was marital status categorized as never married, currently married or formerly married (separated, divorced and widowed).

The enabling variables comprise some individual, community and husband's level variables that could facilitate uptake of contraception. These include access to health services categorized as with difficult or without difficulty; access to radio categorized as

occasional or almost daily; access to family planning messages on radio categorized as yes or no; and wealth index group categorized as poorer, middle or richer. Also included as enabling variables are place of residence categorized as rural or urban and region of residence categorized as Kampala, Central, Eastern, Northern or Western regions. Antenatal care attendance during the last pregnancy categorized as <4 or 4 or more times; husband's education level categorized as uneducated or primary, secondary or tertiary and unknown; and husband's ideal number of children desired categorized as same as spouse, more than spouse, fewer than spouse or not known were also included as enabling variables. The contraception need variables were those that influence women's demand for contraception. These included knowledge of contraceptives categorized as yes or no; number of surviving children categorized as "<4", "4" or more; and fertility intentions of the women categorized as want another child, undecided or want no more children.

Methods of Analysis

The statistical analysis was done in three stages. In the first stage, we described the profile of the women by the selected variables. At this level of analysis, frequency distributions of all variables were employed to describe the profile of the women. At the second stage, we used the chi-square statistics of the form

$$\chi^2 = \sum_{i=1}^r \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$
 to examine the association between

the predisposing, enabling and need variables and uptake of contraception. We concluded that a significant association existed if the $p < 0.05$.

At the third stage, which was the multivariate analysis, the binary logistic regression model was used because the structure of the dependent variable was dichotomous in which uptake of contraception was coded "1" and "0" if otherwise. The model was chosen because the dependent variable met the conditions for the use of the model (Elisa and Wang, 2003). The logistic regression model used

was of the form: $y = \text{Log}_e \frac{P_i}{1 - P_i}$. The estimator used to

interpret the results was the exponentiated beta-coefficients (β^x) (Odds Ratio). We concluded that a variable was a significant predictor of uptake of contraception if the p value associated with the Odds Ratio was < 0.05 .

Results

The socio-demographic profile of the women is presented in Table 1 showing that the median age of the women was 33 years and the majority were in the 35 years or older age group. The mean number of surviving children was 4.2 and nearly 7 in 10 of the women had at least 4 children which is an indication of high fertility.

Table 1. Percentage distribution of women with disabilities by selected characteristics

Characteristics	%	Number
Age group		
<25	21.1	238
25-34	32	361
35+	46.9	529
Median age	33	
Number of children surviving		
<4	43.4	489
4+	56.6	639
Mean number of children surviving	4.2	
Fertility intentions		
Want another child	42.1	475
Undecided	2.4	27
Want no more children	55.5	626
Place of residence		
Urban	24.1	272
Rural	75.9	856
Level of education		
Uneducated	17.5	197
Primary	60.8	686
Secondary	17.1	193
Tertiary	4.6	52
Religious affiliation		
Catholic	43.9	495
Other Christians	43.6	492
Muslims	10.9	123
Others	1.6	18
Marital status		
Never in union	8.8	99
Currently in union	70.2	792
Formerly in Union	21	237
Region of residence		
Kampala	7.8	88
Central	22.6	255
Eastern	26.2	295
Northern	17	192
Western	26.4	298
Wealth status		
Poorer	38.5	434
Middle	18.9	213
Richer	42.6	481
Access to the radio		
Occasional	43.3	488
Almost daily	56.7	640
Knowledge of modern family planning methods		
No	0.5	6
Yes	99.5	1122
Ever received family planning messages on radio		
No	28.5	321
Yes	71.5	807
Access to health facility		
With difficulty	73.8	832
Without difficulty	26.2	296
Number of ANC visits during last pregnancy		
<4	74.1	836
4 or more	25.9	292
Ever used contraceptives		
Yes	26.1	294
No	73.9	834
Husband's education level		
Uneducated or primary	57.5	624
Secondary or tertiary	30.7	333
Unknown	11.9	129
Husband's number of children desired		
Same as spouse	18.6	210
More than spouse	23.6	266
Fewer than spouse	5.6	63
Don't know	52.2	589
Total	100	1128

Table 2. Differentials in uptake of contraceptives by selected characteristics

Characteristics of women	Uptake of contraception		Number	χ^2
	Never used	Ever used		
Age group				
<25	76.9	23.1	238	10.15, p=0.006
25-34	67.9	32.1	361	
35+	76.7	23	529	
Number of surviving children				
<4	73.6	26.4	489	0.04, p=0.442
4+	74.2	25.8	639	
Fertility intentions				
Want another child	74.3	25.7	475	2.00, p=0.367
Undecided	85.2	14.8	27	
Want no more children	73.2	26.86	626	
Place of residence				
Urban	66.2	33.8	272	11.20, p=0.001
Rural	76.4	23.6	856	
Level of education				
Uneducated	87.8	12.2	197	33.68, p=0.0001
Primary	73.6	26.4	686	
Secondary	64.8	35.2	193	
Tertiary	59.6	40.4	52	
Religious affiliation				
Catholic Christians	76.2	23.8	495	4.99, p=0.172
Other Christians	73	27	492	
Muslims	67.5	32.5	123	
Others	83.3	16.7	18	
Marital status				
Never in union	78.8	21.2	99	4.69, p=0.096
Currently in union	72.1	27.9	792	
Formerly in Union	78.1	21.9	237	
Region of residence				
Kampala	69.3	30.7	88	10.77, p=0.029
Central	68.6	31.4	255	
Eastern	72.2	27.8	295	
Northern	77.6	22.4	192	
Western	79.2	20.8	298	
Wealth status				
Poorer	83.9	16.1	434	39.47, p=0.000
Middle	72.3	27.7	213	
Richer	65.7	34.3	481	
Access to the Radio				
Occasional	79.3	20.7	488	12.85, p=0.000
Almost daily	69.8	30.2	640	
Ever received family planning messages from radio				
No	81.9	18.1	321	14.88, p=0.000
Yes	70.8	29.2	807	
Access to health facility				
With difficulty	78.7	21.3	832	4.5, p=0.01
Without difficulty	72.2	27.8	296	
Number of ANC visits in last pregnancy				
<4	78.1	21.9	836	3.51, p=0.035
4 or more	72.5	27.5	292	
Husband's education level				
Uneducated or primary	73.3	26.7	131	10.27, p=0.006
Secondary or tertiary	77.3	22.7	651	
Unknown	60.3	32.1	346	
Husband's number of children desired				
Same as spouse	70	30	210	3.75, p=0.289
More than spouse	74.4	25.6	366	
Fewer than spouse	68.3	31.7	63	
Unknown	75.7	24.3	589	
Total	73.9	26.1	1128	

Table 3. Binary logistic regression results showing Odds Ratio predicting uptake of contraception by women with disabilities in Uganda

Predictor variables	OR	CI	OR	CI
Access to health facilities				
With difficulty ®	1		1	
Without difficulty	1.35*	1.03-1.95	1.41*	1.02-1.89
Received family planning messages on radio				
No ®	1		1	
Yes	1.87****	1.35-2.58	1.48*	1.04-2.11
Number of surviving children				
<4	1.02	0.78-1.34	0.84	0.58-1.21
4+ ®	1		1	
Age groups				
<25 ®			1	
25-24			1.65**	1.19-2.48
35+			1.17	0.77-1.79
Region				
Kampala			1.44*	1.12-2.26
Central			1.24	0.85-1.95
Eastern			0.84	0.44-1.58
Northern			1.3	0.80-2.11
Western ®			1	
Level of education				
Uneducated®			1	
Primary			2.02**	1.25-3.28
Secondary			2.49***	1.38-4.50
Tertiary			2.68***	1.22-5.90
Wealth status				
Poorer ®			1	
Middle			1.79***	1.18-2.72
Richer			2.01****	1.353.03
Access to the radio				
Occasional ®			1	
Almost daily			1.58*	1.05-1.64
Number of ANC visits during last pregnancy				
<4 ®			1	
4+			1.36*	1.09-1.91

The majority (56%) of the women did not want another child, suggesting that they have already attained their desired family size. On the other hand, 4 in 10 wanted another child which suggests that they have not attained their desired family size. The women were predominantly rural, having primary education, were Christian and currently married. The regional distribution shows that most of the women (26.2 and 26.4%) were from Eastern and Western regions followed by Central, Northern and Kampala regions. Table 1 also shows that nearly two-fifths of the women were in the poorer and richer wealth index groups; 56.7% had daily access to the radio; and 7 in 10 had ever received family planning messages on radio. However, 7 in 10 have difficulty accessing health facilities, attended less than 4 ANC visits during the most recent pregnancy and have never used a modern contraceptive method. Nearly 6 in 10 and 3 in 10 of the women have husbands with primary and secondary education respectively; and more than half of the women did not know the husbands' desired number of children.

Figure 1 presents women by the type of disability. Walking disability was by far the most common form of disability reported by 37.5%, followed by memory loss, reported by nearly 27% of the women. Other important forms of disability were hearing (19%) and sight (15.6%) impairments. Inability to communicate was the least reported disability by about 1% of the women.

Table 2 presents differentials in uptake of contraception. The table shows that uptake of contraception was significantly more prevalent among women in the 25-34 year age group; in urban areas; increased monotonically with the level of education and wealth index group; and in Kampala and Central regions, followed by Eastern and Northern regions. More women having almost daily access to the radio had ever used contraceptives and nearly 3 in 10 of the women who received family planning messages through the radio also used contraceptives. Additionally, more than one-quarter of the women accessing health facilities without difficulty and attended 4 or more ANC visits during the most recent pregnancy had ever used contraceptives.

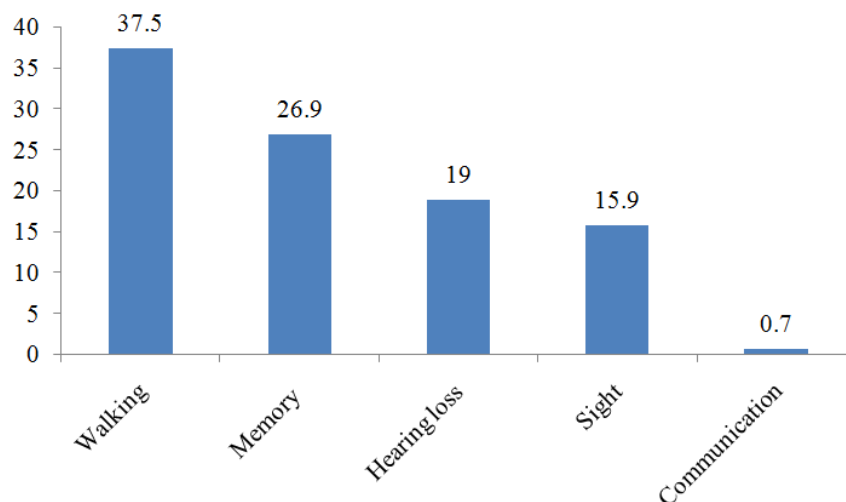


Fig. 1. Distribution of women by forms of disability

Regarding differentials in uptake of contraception by husband's characteristics, 26.7 and 32.1% of the women with husbands having secondary or tertiary education and unknown level of education respectively, had ever used contraceptives. Fertility intentions, religious affiliation, marital status, number of surviving children and husband's number of children desired were not significantly associated with uptake of contraception by women with disabilities in Uganda.

In Table 3 the result of the logistic regression model showing significant predictors of uptake of contraception is presented. Model 1 shows that the hypotheses predicting the effects of accessing health facilities without difficulty and receiving family planning messages on radio on uptake of contraception were confirmed. Uptake of contraception was significantly higher by 35% (CI = 1.03-1.95) and 87% (CI = 1.35-2.58) among women who accessed health facilities without difficulty and received family planning messages on the radio respectively. However, the number of surviving children was not a significant predictor of uptake of contraception.

Model 2 shows that accessing health facilities without difficulty significantly increased uptake of contraception by 6% to 1.41 (CI = 1.02-1.89) times. On the other hand, receiving family planning messages on the radio attenuated uptake of contraception by 38% to 1.48 (CI = 1.04-2.11) times but remained a significant predictor of contraception after controlling for other covariates. However, having 4 or more surviving children attenuated uptake of contraception by 18% to 0.84 (0.58-1.21) but remained an insignificant predictor of contraception. Among the control variables, belonging to the 25-34 year age group (OR = 1.65, CI = 1.19-2.48); residing in Kampala region (OR = 1.44, CI = 1.12-2.26);

and having primary (OR = 2.02, CI = 1.25-3.28), secondary (OR = 2.49, CI = 1.38-4.50) and tertiary education (OR = 2.568, CI = 1.22-5.90) were significant predictors of uptake of contraception. Belonging to the middle 1.79 (CI = 1.18-2.72) and richer 2.01 (CI = 1.35-3.03) wealth index groups; having almost daily access to the radio (OR = 1.58, CI = 1.05-1.64); and attending 4 or more ANC visits (OR = 1.36, CI = 1.09-1.91) also significantly increased uptake of contraception.

Discussion

The health and socioeconomic benefits of contraception are greater for population groups at higher risk of socioeconomic and health vulnerability, which include women with disabilities. The objectives of the study were to estimate the prevalence and identify the significant predictors of uptake of contraception by women with disabilities. The study found that the mean number of children ever born was 4.2 and over 8 in 10 of the women were ever married which suggest that women with disabilities in Uganda are sexually active, desire to bear children and have similar marriage and fertility experiences as women without disabilities. The study also found that only 26% of women with disabilities had ever used a modern method of contraception which is low; only 3 in 10 of the women who received family planning messages on radio; nearly 28% of the women who accessed health facilities without difficulty; and only one-quarter of the women having 4 or more surviving children had ever used a modern method of contraception. The above finding raises the importance of addressing the challenges women with disabilities face in using sexual and reproductive health services, including uptake of contraception.

The study found that the prevalence of contraception among women with disabilities is similar to the prevalence of contraception among ever married women in Uganda (UBOS and ICF Inc, 2012). The finding suggests that women with disabilities experience similar socio-cultural and structural barriers in using contraceptives as women without disabilities in Uganda. These challenges include lack of or poor access to appropriate contraceptive method of choice, fear of side effects, community norms regarding family size, partner disapproval and poor attitude of health workers (FHI 360, 2014; Kayongo, 2014). Other previous studies elsewhere also found that poor access to health facilities and attitudes of health workers towards women with disabilities impede their access to family planning services (Anderson and Kitchin, 2000; Hamid and Stephenson, 2006). In these regards, increasing access to health facilities and changing the attitudes of health workers in providing services by inclusion of disability training, effective and supportive supervision are required. Adapting community-based outreach family planning services which can be implemented by Community Health Workers now available in Uganda could also increase access to contraception for hard-to-reach women as well as hard-to-reach areas. Because contraception is usually the least of the services that take women to health facilities, hard-to-reach women in rural areas are most likely to miss out on contraception. In addition, the community-based distribution of family planning services can enable women with disabilities to avoid the stigma associated with public uptake of contraception, which has been successful in similar family planning programmes in some parts of India and Pakistan (Servais, 2006).

Our study found that despite the low prevalence of contraceptive uptake by women with disabilities, access to health facilities without difficulty increased uptake of contraception by women with disabilities. This could be attributed to the increased expansion of the basic health care services facilities by reducing the distance and time taken to reach facilities, increased range of services at facilities including family planning services now provided by 83% of health facilities and the relatively low cost of outpatient services in Uganda (IHME, 2014). However, access to health facilities in rural areas may impede uptake of contraception for women with disabilities because of higher transport costs, poor road network and limited means of transport which could contribute to the lower prevalence of contraception by women with disabilities, which is consistent with a similar study elsewhere (Ganle *et al.*, 2016).

The study also confirmed the hypothesis that receiving family planning messages on radio significantly increased uptake of contraception and persisted even after being controlled for by other

demographic and social characteristics of the women. The finding compares well with the high radio coverage estimated at nearly 70% of the general population and consistent with reports on radio coverage in Uganda (UBOS, 2016). The increased uptake of contraception observed in this study is consistent with a previous study in the general population in Kenya (Westoff and Rodriguez, 1995) which found that the radio alone contributed to uptake of contraception by 26% among women who received family planning messages on the radio compared to women who did not. A similar study in Nigeria found that apart from messages on television, the radio was a very important predictor of uptake of contraception (Ajaero *et al.*, 2016) which suggests that messages on the benefits of smaller family size, methods of achieving small family size and where to obtain such methods can change attitudes and have a positive effect on uptake of contraception even among women in difficult circumstances such as those with disabilities.

Our finding shows that women with disability who attended ANC 4 or more times were more likely to have used contraception. The finding is consistent with previous studies in the general population of women in Kenya (Singh *et al.*, 2009) and Mexico (Tisha *et al.*, 2015) which found that women who received ANC regularly also received contraception services which was attributed to the contraception counselling women received during ANC. Many women do not take up contraception because they have either not attended antenatal care or do not usually return for contraceptive counseling after birth. As a result, providing contraception counselling during ANC could be the most effective timing to encourage new mothers to take up contraception and prevent unintended pregnancies.

Our study found that women with disabilities in Kampala metropolitan region were significantly more likely to have used contraception than women from other regions. This finding is consistent with previous studies on contraception in Uganda, which found that women in urban areas have a higher uptake of contraception (Vernon, 2009) which was attributed to better knowledge, better access to and adequate supply of contraceptive commodities in large urban areas such as Kampala region than in rural regions such as Karamoja region (Paul *et al.*, 2015). Another study, also in Uganda, found significant regional variation in uptake of contraception, with the northern and Karamoja regions, which have the lowest levels of all development indices, having the lowest contraceptive prevalence. The study suggests that contraception is highly influenced by other development indicators such as level of education and income (Andi *et al.*, 2014). From these studies, we can conclude that the regional variation in uptake of contraception is not necessarily a problem of disability, but rather the manifestation of structural inequalities.

Addressing these inequalities will not only increase uptake of contraception by women with disabilities, but by all women in Uganda.

Furthermore, the study found that uptake of contraception by women with disability increased with the level of education. Having primary, secondary or higher education were significant predictors of uptake of contraception by women with disabilities. This finding is consistent with the findings in the general population of women in other studies elsewhere (Apanga and Adam, 2015; Asiimwe *et al.*, 2013) and in Uganda (Kiragu and Zabin, 1995). These studies have identified education as an important structural factor that increases the self-efficacy of individuals regardless of their life situations. The self-efficacy created by education empowers women to use reproductive health services including contraception by overcoming systemic barriers such large family size norms and subservience to men on matters related to sexuality. Education also increases uptake of contraception by eradicating myths associated with the side-effects, safety and long-term effects on fertility that are perceived to result from using contraceptives (Bbaale and Mpuga, 2011). Improving the access of women with disabilities to education can increase their self-esteem and enable them to demand and obtain contraceptive services.

We also found that wealth status is a significant predictor of uptake of contraception even among women with disabilities, showing that uptake of contraception increased with wealth status which is in agreement with previous studies including one in Uganda (Chipeta *et al.*, 2010; George, 2002). The lower uptake of contraception among poor women is attributed to inequalities exacerbated by differences in wealth status, which also occurs among women with disabilities. Additionally, women with disabilities in the middle and richer wealth quintile groups can assert their choice and timing of contraception independent of their husbands, which women in the poorer wealth quintile may find difficult to do as they depend on their husbands for the resources they need to access services.

Our study found that access to the radio on an almost daily basis increased uptake of contraception by women with disabilities. The finding is consistent with the general belief that the radio, as the most available channel of information in poor societies, is the most effective channel of transmitting communications about behaviour change to marginalized and vulnerable populations. A previous report found that the radio can be an effective channel for breaking down cultural barriers on reproductive health issues (Kibira *et al.*, 2014). In Nigeria, the extensive use of the media, particularly the radio, to transmit family planning information appears to have increased uptake of contraception (Nwadiwe, 2013). However, it should be noted that the easy access to the radio by most poor

households does not mean automatic access to information about reproductive health behaviour change. Many households in sub-Saharan Africa own radio sets, but the radio is often not used effectively for accessing health-promoting information. This reality was observed in a study in Kenya where the radio was mostly used as a channel of entertainment (Akpobo, 2015). Nevertheless, strategically placed announcements and information on family planning can be made to reach potential users, which could explain the increased uptake of contraception by women with disabilities who have almost daily access to the radio.

Limitations

Although our study was able to show the important factors predicting increased uptake of contraception by women with disabilities, the results could have been affected by some limitations. These include the self-reported data which may have been affected by social desirability bias; and the knowledge by the women that disability is sometimes negatively construed which could have influenced reporting based on what they perceived to be happening rather than what they actually did. Additionally, the use of cross-sectional data does not explain the temporal nature of contraception behaviour as this may change overtime. In order to fully understand contraceptive behavior of women with disabilities, we recommend a qualitative study that can unpack and identify deeper insights behind the quantitative results we have observed so far. Nevertheless, the present study contributes to our understanding of uptake of contraception by women with disabilities, which is of importance to public health. We were able to identify some significant variables that increase uptake of contraception, which could help in the development of interventions to address the unmet need for contraception by women with disabilities.

Conclusion

The result of this study shows that the Anderson Behavioural Model on Health Service Use is appropriate in explaining uptake of contraception by women with disabilities. As in the general population, the present study revealed a high unmet need for contraception among women in Uganda with disabilities. The results also shows that access to health facilities and access to family planning messages on the radio are imperatives in increasing uptake of contraception by women with disabilities. This is because disabilities of any kind could impede effective use of health facilities if persons with disabilities struggle to reach health facilities and or have no access to family planning messages. Additionally, removing structural barriers caused by differences between regions, levels of education, wealth index

groups and access to family planning messages are important in increasing uptake of contraception by women with disabilities.

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Author's Contributions

NA and SK both contributed to conceptualization, analysis, interpretation of results and write up of the manuscript. We also contributed critically in addressing the comments made by reviewers and revision of the manuscript for publication.

Disclosure of Interests

The authors have no interest to disclose in this study.

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