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Influence of mass media on contraceptive use among women in Uganda

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Abstract
This study aimed at determining the influence of mass media on contraceptive use among women in Uganda. Assessment was done using structural equation modelling and secondary data from the Uganda Demographic and Health Survey 2011 where a representative sample of 10,086 households was selected countrywide. All women aged 15-49 years who were permanent residents of the households were considered for this study.
Contraceptive use was significantly indirectly influenced by age, region, residence, education level, radio ownership, television ownership and wealth quintile through the number of media sources a woman was exposed to. Contraceptive use was significantly directly influenced by age, residence, education level, religion, wealth quintile and number of media sources a woman was exposed to. Contraceptive use increased with increase in age, education level, wealth index and number of media sources.
The study recommended the exploration of other alternative yet cost effective mass media such as mobile phones which come with numerous avenues for fronting information on family planning ranging from text messages and voice calls to use of social media platforms such as Facebook, Twitter etc.

Keywords: mass media, women, Uganda, contraceptives

1. Introduction
Promotion of family planning in countries with high birth rates has the potential to reduce poverty and hunger, avert 32 percent of all maternal deaths and nearly 10 percent of childhood deaths and contribute substantially to women's empowerment and achievement of universal primary schooling and long-term environmental sustainability [8]. In the past 40 years, family-planning programmers have played a major part in raising the prevalence of contraceptive practice from less than 10 percent to 60 percent and reducing fertility in developing countries from six to about three births per woman [8]. Although in half the 75 larger low-income and lower-middle income countries (mainly in Africa), contraceptive practice remains low and fertility, population growth and unmet need for family planning are high [8]. Uganda has the 5th highest birth rate in the world with women on average giving birth to 6.2 children and a contraceptive prevalence of 42 percent for all women and 30 percent for the married [26].
Concerns about high fertility and low contraceptive use prevalence in Sub-Saharan Africa have stimulated policy and program efforts aimed at promoting family planning in the region with substantial money and time being currently expended for the purpose of educating people about the advantages of fewer children and motivating them to adopt family limitation [5]. The use of mass media to achieve these objectives has recently increased and both government and private agencies are involved in developing and implementing programs through the use of social media facilities [25]. Goal 3 of the Sustainable Development Goals (SDGs) is focused on ensuring healthy lives and promotion of well-being for all at all ages. Target 3.7 is specifically focused on ensuring universal access to sexual and reproductive health care services, including family planning, information and education and the integration of reproductive health into national strategies and programmers by the year 2030 [21].
Recent research based on nationally representative surveys confirms the strong association between exposure to family planning methods in the mass media and contraceptive use with studies documenting increased contraceptive use and other behavioral changes following specific communication interventions using one or more media channels [12]. Studying the effect of exposure to various media sources is an application of the epidemiological concept of dosage response with one of the assumptions being that women who recall messages in several media are exposed to a higher dose of family planning information than those exposed to a few media sources and hence the number of media sources can be used as a proxy to measure intensity of exposure [12].
Mass media interventions use a range of methods to communicate a message to the general public or specific groups. The media include radio, television, internet, mobile phone, print (newspapers, magazines, booklets, leaflets, posters and pamphlets), films, documentaries, billboards, folk media-like street dramas or a combination of these.
Overtime, several studies [20, 23, 29] on the relationship between mass media and contraceptive use among women have continued to strengthen the argument that mass media is key to influencing the reproductive behavior of women. According to [29], there was a 25 percent rise in contraceptive use among women who heard radio messages, 40 percent rise among women exposed to both radio and print messages and 50 percent rise among those exposed to radio, print and television messages. Also, [20]

reported similar findings with regards to men contraceptive use in Senegal; noting increase in men who were exposed to Urban Reproductive Health Initiative (URHI) television programs. However, an aspect that has been ignored is woman's socio-demographic factors including age, religion and education level [15]; which likely, influences the mass media one is exposed to, as well as the intensity of exposure and, subsequently the decision to use contraceptives or not. This was the basis for the current study to ascertain both the direct and indirect effect of mass media exposure on a woman's decision to use or not to use contraceptives.

1.1 Conceptual framework

The Health Care Utilization Model [3] underpinned this study. The model consists of three major categories of health service utilization determinants including predisposing factors, enabling factors and need factors. Predisposing factors include biological factors that may influence the likelihood that an individual needs a health service, social structure that may influence how an individual can cope with health problems, health beliefs that may influence an individual's perception of need for a health service [3] and demographic characteristics and socio-structural characteristics such as education level, race, ethnicity and family size [14]. Enabling factors include family characteristics such as income, insurance coverage, access to services (transportation and distance to care), community characteristics such as availability of resources and region of the country [14]. Perceived needs refer to a person's health beliefs or psychosocial factors [7] when measuring access to health care services. Perceived needs may include aspects of the subject's attitudes, values, and knowledge about health problems and services that affect her perception of whether one does or does not need health services [14].

This study focused mainly on the predisposing factors including age, education level and religion of woman. The enabling factors captured included region where the household is located, residence (rural/urban), ownership of a radio, ownership of a television and household wealth quintile. These constituted the independent variables of the study. A hybrid intermediate variable was developed to measure intensity of exposure to mass media including radio, television and newspaper. The hybrid intermediate variable consisted of four categories whereby a woman was exposed to either none, one, two or all the three media, with the assumption that the more media a woman is exposed to, the more likely she is to use contraceptives. The dependent variable, contraceptive use was considered dichotomous, that is, either a woman uses contraceptives (both modern and traditional methods) or doesn't.

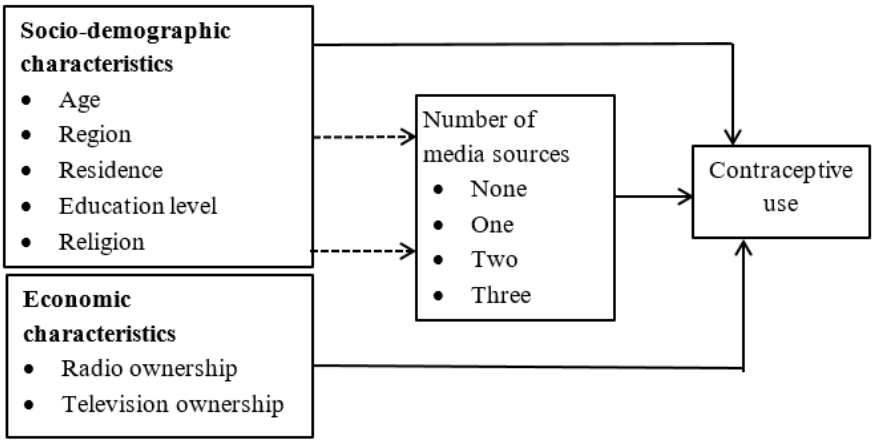

Fig 1: Conceptual framework adopted for the study

1.2 Objectives of the study

The objective of the study was to determine the influence of mass media on contraceptive use among 15-49 year olds; specifically on the intensity of exposure to family planning messages on uptake. In addition, the study looked at the influence of women's socio-demographic and socio-economic factors on; contraceptive use, both, directly and indirectly and the number of media sources one is exposed to as a measure of intensity of exposure to family planning messages.

2. Materials and methods

2.1 Data source

The data used in this study was from the Uganda Demographic and Health Survey 2011 [26], where a representative sample of 10,086 households was selected in two stages. In the first stage, 404 enumeration areas (EAs) were selected from among a list of clusters. In the second stage of sampling, households in each cluster were selected from a complete listing of households, which was updated prior to the survey. Households were purposively selected from those listed. All households in the 2010 Uganda National Household Survey that were in the 404 EAs were included in the UDHS sample. All women aged 15-49 years who were either permanent residents of the households or visitors who slept in the households the night before the survey were eligible to be interviewed [26].

2.2 Data analysis

Data was analyzed using STATA Version 13.0 at three stages. Firstly, a descriptive summary of all plausible independent variables was done using frequency distributions. Secondly, using the Pearson's chi-square

test (Eqn.1) association between both contraceptive use and plausible independent variables as well as between number of mass media and plausible independent variables was tested. Independent variables that were significant (p≤0.05) at this level were considered for further analysis.

$$\chi^2 = \sum_{i=1}^{k} \sum_{j=1}^{n} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \quad (1)$$

Where O_{ij} is the number of individuals observed in the i^{th} row and j^{th} column cell, E_{ij} is the number of individuals expected in the ith row and jth column cell.

Thirdly, a structural equation model was fitted to assess the direct and indirect effects of socio-demographic and socio-economic factors on contraceptive use. Since the dependent variable, contraceptive use, was binary in nature, the logistic regression model was used to obtain its direct determinants.

$$\log\left[\frac{p_i}{1-p_i}\right] = \alpha_0 + \alpha_1 X_{1i} + \alpha_2 X_{2i} + \alpha_3 X_{3i} + \cdots + \alpha_k X_{ki} + \epsilon_{ij} \quad (2)$$

Where p_i is the probability of using contraceptives, $1 - p_i$ is the probability of not using contraceptives, $\alpha_0 \ldots \alpha_k$ are partial intercept and slope coefficients, $X_{1i} \ldots X_{ki}$ are plausible independent variables and ϵ_{ij} is the error term.

As for intermediate variable, measured by the number of media sources a woman is exposed to, the ordered logistic regression model was fitted to identify the indirect determinants of contraceptive use.

$$log\left(\frac{(P(y_i \leq j)}{(P(y_i > 1)}\right) = \beta_j + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki} + \epsilon_{ij} \quad (3)$$

Where ϵ_{ij} is the error term, $\beta_1 \ldots \beta_k$ are slope coefficients and $X_{1i} \ldots X_{ki}$ are plausible independent variables.

3. Results

A descriptive summary of the socio-demographic and economic characteristics of the women involved in the study is provided in Table 1.

Table 1: Description of respondents

Variable		Frequency	Percentage
Contraceptive use	Non-user	6,518	77.21
	User	1,924	22.79
Number of media sources	None	2,524	29.9
	One	4,107	48.65
	Two	1,170	13.86
	Three	641	7.59
Age	15-19	1,940	22.98
	20-24	1,602	18.98
	25-29	1,577	18.68
	30-34	1,083	12.83
	30 plus	2,240	26.53
Region	Central	2,607	30.88
	Northern	2,684	31.79
	Western	1,698	20.11
	Eastern	1,453	17.21
Residence	Urban	2,473	29.29
	Rural	5,969	70.71
Education level	No education	1,313	15.55
	Primary	4,713	55.83
	Secondary	1,891	22.4
	Higher	525	6.22
Religion	Catholic	3,633	43.03
	Protestant	2,398	28.41
	Muslim	1,141	13.52
	Pentecostal	1,052	12.46
	Others	218	2.58
Radio	No	2,917	34.55
	Yes	5,525	65.45
Television	No	6,970	82.56
	Yes	1,472	17.44
Wealth quintile	Poorest	1,728	20.47
	Poorer	1,402	16.61
	Middle	1,369	16.22
	Richer	1,493	17.69
	Richest	2,450	29.02

Table 1 above provides a summarized description of the characteristics of the women considered for the study. Majority of the women didn't use (77.21%) any contraceptives, either modern or traditional. The highest proportion of women was exposed to family planning information through one media source (48.65%), with only 7.59 percent exposed to all the three media sources. Majority of the women resided in rural areas (70.71%) had attained primary level education (55.83%) and had a radio (65.45%) in the household

Table 2: Association between plausible independent variables and contraceptive use

Variables		Contraceptive use	
		Non-user	User
Age	15-19	93.66	6.34
	20-24	77.90	22.10
	25-29	70.01	29.99
	30-34	68.14	31.86
	30 plus	71.92	28.08
	Chi2(4) = 431.4841 Pr = 0.000		
Region	Central	71.00	29.00
	Northern	81.15	18.85
	Western	76.21	23.79
	Eastern	82.24	17.76
	Chi2(3) = 102.6535 Pr = 0.000		
Residence	Urban	68.38	31.62
	Rural	80.87	19.13
	Chi2(1) = 154.9993 Pr = 0.000		
Education level	No education	87.97	12.03
	Primary	78.49	21.51
	Secondary	70.81	29.19
	Higher	61.9	38.1
	Chi2(3) = 204.6063 Pr = 0.000		
Religion	Catholic	80.02	19.98
	Protestant	73.31	26.69
	Muslim	75.46	24.54
	Pentecostal	79.47	20.53
	Others	71.56	28.44
	Chi2(4) = 45.9660 Pr = 0.000		
Radio	No	82.65	17.35
	Yes	74.33	25.67
	Chi2(1) = 75.0744 Pr = 0.000		
Television	No	79.45	20.55
	Yes	66.58	33.42
	Chi2(1) = 114.5544 Pr = 0.000		
Wealth quintile	Poorest	90.8	9.2
	Poorer	82.17	17.83
	Middle	76.77	23.23
	Richer	74.08	25.92
	Richest	66.94	33.06
	Chi2(4) = 356.2697 Pr = 0.000		
Number of media sources	None	86.61	13.39
	One	75.51	24.49
	Two	71.54	28.46
	Three	61.47	38.53
	Chi2(3) = 245.1612 Pr = 0.000		

All plausible independent factors were significantly associated ($p \leq 0.05$) with contraceptive use. With regards to age, majority (93.66%) of women aged 15-19 didn't use contraceptives. The highest non-use (80.87%) was among women residing in rural areas in the regions of Northern (81.15%) and Eastern (82.24%) regions. Majority (87.97%) of women who were not educated never used contraceptives as well as Catholics (80.02%). Women from households with a radio had the highest proportion (25.67%) using contraceptives though this was even higher in women from households that had television, (33.42%). Majority (33.06%) of women from poorest wealth quintile (90.8%) never used contraceptives whereas women from the richest wealth quintile had the highest proportion using contraceptives. Women exposed to family planning messages from three media sources had the highest (38.53%) proportion using contraceptives with the majority (86.61%) of women not exposed to any media source, not using contraceptives.

Table 3: Association between plausible independent variables and number of media sources

Variables		Number of media sources			
		None	One	Two	Three
Age	15-19	37.16	41.29	15.26	6.29
	20-24	24.78	48.38	16.67	10.17
	25-29	27.33	50.6	13.19	8.88
	30-34	27.79	49.58	13.39	9.23
	30 plus	30.09	53.39	11.34	5.18
	Chi2(12) = 152.4922 Pr = 0.000				
Region	Central	21.56	39.36	22.82	16.26
	Northern	31.33	56.04	9.91	2.72
	Western	25.56	63.66	7.48	3.30
	Eastern	47.28	34.14	12.53	6.06
	Chi2(9) = 1.1e+03 Pr = 0.000				
Residence	Urban	18.84	35.18	26.00	19.98
	Rural	34.48	54.23	8.83	2.46
	Chi2(3) = 1.4e+03 Pr = 0.000				
Education level	No education	56.21	41.05	2.21	0.53
	Primary	30.53	56.72	10.04	2.72
	Secondary	16.02	40.67	27.29	16.02
	Higher	8.38	24.00	28.95	38.67
	Chi2(9) = 2.3e+03 Pr = 0.000				
Religion	Catholic	35.87	46.49	11.67	5.97
	Protestant	24.52	53.17	14.10	8.22
	Muslim	26.73	44.35	18.40	10.52
	Pentecostal	25.48	49.62	16.16	8.75
	Others	27.52	52.75	12.84	6.88
	Chi2(12) = 158.8939 Pr = 0.000				
Radio	No	50.53	36.06	9.46	3.94
	Yes	19.00	55.29	16.18	9.52
	Chi2(3) = 920.1833 Pr = 0.000				
Television	No	33.39	53.66	9.97	2.98
	Yes	13.38	24.93	32.27	29.42
	Chi2(3) = 1.9e+03 Pr = 0.000				
Wealth quintile	Poorest	55.44	41.09	3.18	0.29
	Poorer	33.95	58.92	6.56	0.57
	Middle	26.15	64.79	7.67	1.39
	Richer	23.44	59.21	14.00	3.35
	Richest	15.59	32.65	28.94	22.82
	Chi2(12) = 2.6e+03 Pr = 0.000				

All the plausible independent factors had a significant association with number of media sources providing family planning messages a woman was exposed to. The highest proportion of women across all age groups were exposed to one media source though the highest proportion was among women aged 30 years plus (53.39%) and 25-29 years (50.6%); residing in the Northern (56.04%) and Western (63.66%) regions;

residing in rural areas (54.23%); with primary level education (56.72%); Protestant (53.17%) by religion; owning a radio (55.29%); owning no television (53.66%) and belonging to the middle wealth quintile (64.79%). The highest proportion of women exposed to all three media sources were aged 20-24 years (10.17%), residing in the Central region (16.26%), urban residents (19.98%), of higher education level (38.67%), Muslim (10.52%), owning a radio (9.52%), owning a television (29.42%) and belonging to the richest wealth quintile (22.82%).

Table 4: Indirect and direct determinants of contraceptive use

Variables		Odds ratio	[95% C.I]	
Number of media sources <—				
Age	15-19	1.00		
	20-24	1.55**	1.35	1.77
	25-29	1.51**	1.32	1.73
	30-34	1.64**	1.41	1.90
	30 plus	1.61**	1.42	1.82
Region	Central	1.00		
	Northern	0.87**	0.77	0.98
	Western	0.94	0.82	1.07
	Eastern	0.74**	0.64	0.85
Residence	Urban	1.00		
	Rural	0.79**	0.70	0.90
Education level	No education	1.00		
	Primary	2.03**	1.78	2.32
	Secondary	4.83**	4.08	5.73
	Higher	8.93**	7.07	11.26
Religion	Catholic	1.00		
	Protestant	1.10	0.99	1.22
	Muslim	1.06	0.93	1.22
	Pentecostal	1.01	0.88	1.15
	Others	1.00	0.76	1.31
Radio	No	1.00		
	Yes	2.21**	1.99	2.44
Television	No	1.00		
	Yes	2.57**	2.20	3.00
Wealth quintile	Poorest	1.00		
	Poorer	1.29**	1.11	1.49
	Middle	1.44**	1.24	1.68
	Richer	1.62**	1.38	1.89
	Richest	2.50**	2.06	3.03
Contraceptive use <—				
Age	15-19	1.00		
	20-24	4.07**	3.26	5.08
	25-29	6.93**	5.57	8.62
	30-34	7.79**	6.19	9.81
	30 plus	7.44**	6.02	9.21
Region	Central	1.00		
	Northern	0.89	0.77	1.04
	Western	1.14	0.97	1.35
	Eastern	0.91	0.76	1.09
Residence	Urban	1.00		
	Rural	0.85**	0.73	0.99
Education level	No education	1.00		
	Primary	1.86**	1.53	2.26
	Secondary	2.39**	1.90	3.01
	Higher	2.06**	1.54	2.75
Religion	Catholic	1.00		
	Protestant	1.16**	1.01	1.32
	Muslim	0.99	0.83	1.17
	Pentecostal	0.79**	0.66	0.95
	Others	1.20	0.87	1.66
Radio	No	1.00		
	Yes	0.99	0.87	1.14
Television	No	1.00		
	Yes	1.00	0.84	1.20
Wealth quintile	Poorest	1.00		
	Poorer	1.75**	1.40	2.20

	Middle	2.34**	1.87	2.93
	Richer	2.64**	2.10	3.32
	Richest	2.92**	2.25	3.80
Number of media sources	None	1.00		
	One	1.48**	1.27	1.71
	Two	1.38**	1.13	1.68
	Three	1.77**	1.39	2.25

** implies significant with $p < 0.05$

3.1 Indirect determinants of contraceptive use through mass media

Apart from religion, the rest of the plausible independent variables had a significant effect ($p \leq 0.05$) on contraceptive use through the number of media sources a woman was exposed to.

Pertaining to age, for women aged 20-24 years, the odds of exposure to three media sources versus the combined two, one and none are 1.55 times higher than for women aged 15-19 years, other factors held constant. Similar findings were obtained for women aged 25-29 years (OR=1.51), 30-34 years (OR=1.64) and 30 plus (OR=16.1).

As for region where household is located, for women from households in the Northern region, the odds of exposure to three media sources versus the combined two, one and none are 0.87 times lower than for women from the Central region, other factors held constant. Similar results were reported for the Eastern region (OR=0.74).

Regarding residence of household, for women from rural households, the odds of exposure to three media sources versus the combined two, one and none are 0.79 times lower than for women from urban households, other factors held constant.

With regards to education level, for women with primary education, the odds of exposure to three media sources versus the combined two, one and none are 2.03 times higher than for women from urban households other factors held constant. This increased further for women with secondary (OR=4.83) and higher (OR=8.93) education.

Regarding radio ownership, for women in households with a radio, the odds of exposure to three media sources versus the combined two, one and none are 2.21 times higher than for women from households with no radio other factors held constant. Similarly for television ownership, for women in households with television, the odds of exposure to three media sources versus the combined two, one and none are 2.57 times higher than for women from households with no television, other factors held constant.

Pertaining to household wealth quintile, for women from households in the poorer wealth quintile, the odds of exposure to three media sources versus the combined two, one and none are 1.29 times higher than for women from households in the poorest wealth quintile, other factors held constant. This increased further for women coming from households in the middle (OR=1.44), richer (OR=1.62) and richest (OR=2.50) wealth quintiles.

3.2 Direct determinants of contraceptive use through

Regarding age, the odds of women aged 20-24 years using contraceptives were 4.07 times higher compared to women aged 15-19 years, other factors held constant. This increases further for women aged 25-29 years (OR=6.93), 30-34 years (OR=7.79) and 30 years plus (OR=7.44).

With regards to residence, for women residing in rural areas, the odds of using contraceptives were 0.85 times lower compared to urban residents, other factors held constant.

Pertaining to educational level, the odds of women with primary education using contraceptives were 1.86 times higher compared to women with no education, other factors held constant and were higher for women with secondary (OR=2.39) and higher (OR=2.06) education.

As for religion, for women who were Protestants, the odds of using contraceptives were 1.16 times higher compared to women who were Catholics, other factors held constant. On the contrary, for women who were Pentecostals, the odds of using contraceptives were 0.79 times lower compared to Catholics, other factors held constant.

Regarding wealth quintile, the odds of women in the poorer wealth quintile using contraceptives were 1.75 times higher compared to women in the poorest wealth quintile, other factors held constant and was the case for women in the middle (OR=2.34), richer (OR=2.64) and richest (OR=2.92) wealth quintiles.

As regards number of media sources, for women exposed to one media source, the odds of using contraceptives were 1.48 times higher compared to women who were not exposed to any media source other factors held constant. Similarly, for women exposed to two media sources, the odds of using contraceptives were 1.38 times higher compared to women who were not exposed to any media source other factors held constant. Finally, for women exposed to three media sources, the odds of using contraceptives were 1.77 times higher compared to women who were not exposed to any media source other factors held constant.

4. Discussion

Regarding the influence of socio-demographic factors on a woman's decision to use contraceptives, the study found that contraceptive use generally increased with a woman's age [9, 11] and education level [22, 9]. The significance of age can be attributed to the fact that contraceptive use in younger women involves a lot of experimentation and inconsistency as opposed to the older women who have a high compliance with contraceptive regimens [2, 4, 6]. In addition, younger women face many barriers hindering utilization of family planning services such as fear of side effects, lack of physical and financial access and lack of knowledge on

the importance and availability of contraceptive types [16, 17]. The positive effect of education level can be attributed to the higher exposure to information on contraceptives among school going females hence increasing their likelihood of gaining knowledge, understanding and a positive attitude towards contraceptives, subsequently increasing their utilization levels [16]. Contraceptive use was also high among women residing in urban areas [11, 28] and Protestants by religion [9, 24]. The low utilization in rural areas can be attributed to inaccessibility and low availability of family planning services; with rural areas being characterized by few under-stocked public health facilities and few private health service providers. With regards to religious influence, some denominations oppose modern contraceptive methods increasing non-use especially in Africa where religion has a major influence on behavioral practices. On the contrary, region was insignificant, inconsistent with findings by [9, 18] which may be attributed to inexistence of regional differences with regards to women and household characteristics. Furthermore, the current government family planning programme under the Health Sector Development Plan 2014/15-2019/20 has focused on promoting uptake countrywide as opposed to previous and current initiatives by NGOs focusing on specific places due to cost implications, which were previously resulting into disparities in uptake of family planning with increments recorded in areas were family-planning-focused-NGOs are operating. Apart from household wealth quintile [9, 22], the rest of the socio-economic factors, that is, ownership of radio and television had no significant effect on contraceptive use though inconsistent with findings by [1, 12, 13]. Number of media sources a woman is exposed to significantly affected contraception use [1, 10, 12, 22]. This can be attributed to the fact that increased exposure leads to changes in family planning knowledge, attitude and practices, creating a conducive environment in which family planning can be viewed as a social norm making it more and more acceptable to people as exposure to family planning methods increases [19]. Furthermore, exposure to family planning messages increases likelihood of women discussing family planning with their spouses and visiting health facilities, increasing utilization [12].

5. Conclusion

This study focused on the determination of the direct and indirect influence of mass media on modern contraceptive use among women in Uganda. Contraceptive use was indirectly influenced by age, region, residence, education level, radio ownership, television ownership and wealth quintile through the number of media sources a woman was exposed to. Contraceptive use was directly influenced by age, residence, education level, religion, wealth quintile and number of media sources a woman was exposed to. The study concludes that contraceptive use increased with increase in age, education level, wealth index and number of media sources. The findings point to the importance of mass media in fronting and encouraging contraceptive use among women through providing information that is needed to influence changes in attitude and practices of both women and men. This calls for exploration of other alternative yet cost effective mass media such as mobile phones which come with numerous avenues for fronting information on family planning ranging from text messages and voice calls to use of social media platforms such as Facebook and twitter whose use has grown with rise in accessibility and affordability of smartphones and internet services in Uganda.

6. Limitations to the study

The study does not claim that the level of contraceptive use solely depends on availability of mass media because besides other factors, such as cultural and supply, the DHS collected cross-sectional data. Unlike longitudinal, cross-sectional data often times do not provide sufficient evidence to derive the causes of contraceptive use. Nonetheless, the findings of this study point to the fact that mass media are important pathways for information communication about contraceptive use in Uganda.

7. References

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