

Original Research Article

Impact of exposure to mass media on utilization modern contraceptive among adolescent married women in Ethiopia: evidence from Ethiopia demographic health survey 2016

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ABSTRACT

Background: More than one billion of world population was adolescent age group. Adolescents are high risk of unwanted pregnancy related to pregnancy is preventable. This complication can be prevented by use of family planning method. One of the challenges to use family planning was lack of information about contraceptive. This study was investigated mass media impact on use of modern contraceptive among adolescent in Ethiopia, 2016 E. C.

Methods: This study conducted based on EDHS (Ethiopia demographic health survey) 2016 data which was cross-sectional study design. Sample size for this study was 588 adolescent married women that completed interview in EDHS 2016. Mass media impact on modern contraceptive use were analyzed using propensity score matching. Recursive biprobit probit model was used to determine factor associated with mass media exposure on modern contraceptive utilization.

Results: In Ethiopia about 31.8% of adolescent married women currently used modern contraceptive. Exposed to family planning message had 16.8%, 13.2%, 17% and 21.9% point higher modern contraceptive use than unexposed to mass media message. In this study significant factor affected modern contraceptive use included residence, wealth index, radio message, exposed to TV message, magazine message and exposure to mass media message family planning.

Conclusions: This study shows magnitude of contraceptive utilization was low and it might be due to lack of information about family planning. Therefore, policy maker and concerned body should consider dissemination family of planning information by mass media.

Keywords: Contraceptive, Ethiopia, Recursive biprobit probit, Adolescent married women

INTRODUCTION

Adolescents age between 15-19 years were millstone time for reproductive and sexual health. Adolescent women compromise 16% of all women of reproductive age globally. Adolescent estimated about 250 million live in developing countries. More than one in five of adolescent girls are currently married. Every year 16 million adolescent give birth and 95% of these births take place in developing country.¹ Childbirth among

adolescents face higher risks of maternal mortality obstructed labor, obstetric fistula and low education attainment and unemployment.²

Untended pregnancy and high fertility rate were significantly reduced by using modern contraceptive method mainly for developing country.^{3,4} Married adolescent women wanted to delay space or limit their births but many of adolescent were not using contraceptive. Helping adolescent girls to use

contraceptive would avoid unintended pregnancies that can have benefit life long development.^{5,6}

Family planning program had concerned issue like family planning policy and commodities in addition to family planning services, information, attitudes and practices.⁴ Adolescent girls had long been neglected in the global health agenda but this period was pivotal for promoting health behavior that could have lasting impact on their future health and wellbeing.⁷

The source of information and advice about where to access of family planning service. Use of mass media for health education and disease prevention was well documented and it had important role in promoting awareness and practices.⁸⁻¹⁰ Mass media created public awareness about family planning including knowledge, effectiveness and source about contraceptive methods.¹¹ It was important components of information education and communication that can be effective to promote family planning programmes.¹²

Currently mass media were top sources of information about contraceptive information. Most commonly used mass media was radio which accounted 76% of major source of information. Other commonly used channel included print materials (72%), television (62%) and outreach workers (52%). In Sub-Saharan region there was increase of available of these mass media and about 5.2% of households have a television.¹³

Inadequate knowledge and perception of health prevention practices was a major drawback to prevention and intervention of any public health challenge.^{14,15} To improve health prevention practices programmer should integrate health communication tool in health-related program to reduce gap of information between health professional and public. Media can play an important role in changing sexual behaviors, transforming negative beliefs and increasing family planning knowledge.⁹

Young people have indicated the media as a top source of information that young people are excessive users of media including radio, television and newspapers. These media have advantage of simply reach a large proportion of population. However, information disseminated by mass media rarely focused on young population rather targeted on general public.^{13,16} More ever mass media exposure to mass media message about family planning message was incidental. So, to disseminate targeted goal the dose of exposure to mass media message has affect it otherwise it would be passive. Despite these challenge mass media had promise contribution in disseminate health related messages to large audiences repeatedly and over time.¹⁷

Mass media was particularly potent as it allowed national and local program planners to reach a large proportion of an intended population within a relatively short time. Mass media was most credible channel and primely it

targeted to create awareness. Mass media also reinforced health seeking behavior among young.^{8,18}

Young mostly spend their time on mass media for different reason but still limited evidence in assessing use of mass media on contraceptive use. Therefore, this study assessed the effect of exposure to mass media on contraceptive use. It will examine whether observed differences in the levels of modern contraceptive use signified a positive relationship between exposure to family planning messages and use. General, this evidence provided justification for recommending that these types of interventions be implemented more widely in future.

METHODS

Study design

EDHS 2016 was cross-sectional study design and used multistage sampling technique. It included all regions and two administrative cities. EDHS study period was from 18 January 2016 to 27 June 2016.¹⁹

Study area

Ethiopia was a study area since EDHS was national representative data. Ethiopia located in at horn of Africa. Ethiopia second most populous country most that estimated about 108,805,142 in 2018.^{20,21} In country 24% of population constitute reproductive ages constituted and family planning service provided 24 hour. The study were survey which included selected individual those lived in enumeration area.

Inclusion criteria

All married women aged between 15-19 years in the selected household and completed an individual interview were inclusions criteria.

Exclusion criteria

Women aged between 15-19 years who were no longer living together/separated and widow were exclusion from study.

Data source and extraction

The data for this study were extracted from the 2016 EDHS. The data sets were downloaded in Stata format with permission from the measure DHS website (<http://www.dhs program.com>). After understanding the detailed data sets, further data cleaning and recording were carried out. Required data sets were joined to global positioning system (GPS) coordinates of EDHS.

Sample size determination and sampling procedures

EDHS 2016 collect 588 adolescent married women (weighted sample) age between 15-19 years.¹⁹ Stratified

and two-stage sampling technique was used. In first stage primary sampling unit selected and in second stage household was selected with different probability of selection.¹⁹

Data management, data processing and analysis methods

Data was downloaded from measure DHS website in Stata format. Data management and cleaning was done using Stata. All needed variable was selected and recoded in convenient way. After managing adolescent related data, sampling weight was employed to produce the proper representation of family planning information in analysis of data. Stata 14 used for data extraction, descriptive and summary statistics and impact assessment model. The descriptive statistics report summarized data and respondent characteristics while inferential data analysis using Chi square tests report relationship of characteristic. Impact of mass media exposure on modern contraceptive utilization was analyzed by propensity score matching (PSM) and recursive biprobit probit (RBP) model regression.

Impact assessment

We used PSM and recursive biprobit probit model to assess impact of mass media on contraceptive.^{22,23} Recursive biprobit probit model was used for addressing the issue of endogeneity.²⁴

PSM

PSM used to measure the treatment effect of mass media by grouping individual unit in terms of two potential outcomes after causal effect of given treatment on modern contraceptive. Mass media was treatment variable and modern contraceptive (Y1) the potential outcome or no modern contraceptive (Y0) counterfactual for that subject. In this study exposed to mass media group as observed (Y1) and unexposed respondent group as unobserved (Y0) to be counterfactual outcome for subject.

PSM clarified the effects of campaigns on contraceptive use. PSM computed by create exposed and matched control group that was statistically equivalent. The main attribute of the matching procedure was the creation of the conditions of randomized experiment in order to evaluate a causal effect as in a controlled experiment.²⁵⁻²⁷

The impact of mass media on modern contraceptive utilization was estimated using the endogenous regression model where model can be used to compare observed and counterfactual mass media. PSM estimated in Stata using command `psmatch2`. PSM had a different matching method to adjust for pre-treatment observable differences between treated and untreated group. It used to estimate ATT, ATU and ATE.²⁸⁻³⁰

RBP

Recursive bivariate probit (RBP) processed the resulting bivariate probit correlation parameter as a recursive model of simultaneous equations. It was important because of handling of endogenous binary repressor on two binary outcome variables. It also estimated maximum-likelihood two-equation probit models by allowing to the two binary outcome variables correlated with each other. The bivariate probit model was frequently used to determine factor, impact and test endogenous of treatment variable.^{24,31}

RBP handled problem of exogeneity which used to test whether exposure to mass media family planning message was endogeneity by ρ . The Wald test used to determine whether the models would be best estimated jointly in a recursive manner of not. Likelihood-ratio test that available after bivariate probit to detect the presence of endogeneity and rule out using a simple single-stage binary probit.^{32,33}

Outcome variable

The outcome variable modern contraceptive recorded in measured DHS as modern method, traditional and no method that categorized as modern method and no modern method. Traditional method user considered as none modern method user. It classified as yes (coded as 1) and no (no coded as 0).

Explanatory variables

The predictor variable for modern contraceptive utilization was taken from previous studies. It was considered as control variable to determine effect of mass media. Variables included in study were education, wealth quintile, respondent religion, living children, partner education (coded as no education, educated), working status of respondent, desire more children, visit to health facility and exposed to mass media by radio, TV and magazine message.

Endogenous treatment variable

Mass media exposure to family planning message was considered as treatment variable. It was generated by aggregating family planning message exposed to one of media television, radio and magazine (coded as yes and no).

Ethical consideration

After request EDHS program for dataset, permission was granted to download and use. The consent was obtained from participant before study. Individual identification was not used to treat data confidential. Further the study approved by institutional ethical review board of Dessie health science collage (IRB), Ethiopia.

Patient and public involvement

Since the analysis was based on secondary analysis of EDHS 2016 there was no patient and public involvement (PPI). But during data collection by measure DHS PPI participation was considered.

RESULTS

Description of socio-demographic and mass media coverage among adolescents

In EDHS 2016, a total of 588 adolescent married women were interviewed. The mean age of the respondents was 17 years (\pm SD years). One third of the respondent 171 (29.07%) had no formal education. Most of respondents 526 (89.48) were resident in rural area. About 272 (46.43%) of respondents had more than two children.

Mass media accessibility among married adolescent in Ethiopia DHS were radio and television 147 (24.95%) and 33 (5.67%) respectively. About 147 (25%) of respondent owned a mobile phone but most of respondents did not use internet in 12 last month. About 181 (30.88%) of respondent frequently listen radio message, 119 (20.25%) of respondent frequently watched TV message and 71 (12.11%) of respondent frequently read magazine message (Table 1).

Exposure to mass media family planning message among married adolescents

Exposure to family planning message among modern contraceptive use and intention to use for future were assessed by Chi square test. Contraceptive behavior like intention to use for future and knowledge about family planning message also associated with mass media exposure (Table 2).

Table 1: Description of socio-demographic and mass media coverage among adolescent married women in Ethiopia, 2016.

Variables	Weight frequency	Weight percent
Mass media exposure	133	22.71
No formal educated	171	29.07
Richer wealth index	106	18.00
Richest wealth index	60	10.15
Rural residence	526	89.48
Respondent has children	272	46.43
Partners formally educated	386	65.96
Respondent working status	117	19.90
Desire to have more children	62	10.53
Undecided to have children	14	2.23
Household has radio	147	24.95
Household has television	33	5.67
Mobile ownership	147	25
Use of internet in last 12 months	13	2.16
Health facility visit in last 12 months	267	45.34
Field worker visit in last 12 months	123	20.94
Frequently listen radio	181	30.88
Frequently watch TV	119	20.25
Frequently read magazine	71	12.11
Total	588	100

Table 2: Description of exposure to mass media family planning message among adolescent married women in Ethiopia, 2016.

Variables	Numbers	Unexposed to FP (N=455)		Exposed to FP (N=133)		X ²
		N	%	N	%	
Modern contraceptive	187	126	67.32	61	32.68	30.72
Intention to use	280	218	76.11	61	23.89	14.46
Knowledge about FP	443	75.87	76.87	133	23.13	14.0

Table 3: Treatment effect of exposure to mass media family planning message with in the common support region among adolescent married women in Ethiopia, 2016.

Variables	Samples	Treated	Controlled	Difference	SE	t test
Modern contraceptive utilization	Unmatched	0.4	0.178	0.221	0.038	5.70
	ATT	0.388	0.219	0.168	0.051	3.25
	ATU	0.175	0.335	0.335		
	ATE			0.161		
Intention to use for future	Unmatched	0.670	0.443	0.227	0.058	3.87
	ATT	0.662	0.475	0.187	0.067	2.75
	ATU	0.431	0.594	0.163		
	ATE			0.167		

Table 4: Univariate and RBP estimates of modern contraceptive utilization and expose to FP message among adolescent married women in Ethiopia, 2016.

Variables	Univariate probit		RBP			
	Modern contraceptive		Modern contraceptive		Expose to FP message	
	Coeffecient	Std. error	Coeffecient	Std. error	Coeffecient	Std. error
Media exposure	0.20	0.18	0.91	0.30		
N formal educated	-0.40	0.15	-0.40	0.15	0.23	0.19
Richer wealth index	0.08	0.16	0.04	0.16	0.11	0.21
Richest wealth index	0.59	0.22	0.44	0.22	0.37	0.26
Residence	0.91	0.27	0.75	0.27	0.21	0.32
Respondent has no children	0.18	0.13	0.18	0.12		
Partners formally educated	-0.15	0.14	-0.12	0.14	-0.44	0.18
Respondent working status	0.26	0.15	0.14	0.15	0.33	0.18
Desire to have more children	0.20	0.23	0.35	0.22		
Undecided to have children	0.58	0.47	0.74	0.45		
Household has radio	-0.08	0.15	-0.10	0.14	0.25	0.18
Household has television	-0.89	0.30	-0.92	0.30	1.20	0.41
Mobile ownership	-0.19	0.16	-0.20	0.16	0.32	0.19
Use of internet in last 12 months	0.15	0.42	-0.06	0.43	2.15	1.02
Health facility visit	0.21	0.12	0.11	0.13	0.71	0.16
Radio message	0.20	0.15			0.76	0.18
TV message	0.45	0.18			0.96	0.19
Magazine message	-0.40	0.21			0.83	0.23
Constant	-0.93	0.26	-1.00	0.25	-2.00	0.21
Rho			-0.43	0.19		
Wald chi ²			65.35			
Log likelihood			-316.2			
LR test			4.33			

Table 5: Univariate and RBP estimates of modern contraceptive utilization and expose to FP message among adolescent married women in Ethiopia, 2016.

Variables	Univariate probit		RBP			
	Intention to use		Intention to use		Expose to FP message	
	Coeffecient	Std. error	Coeffecient	Std. error	Coeffecient	Std. error
Mesia	0.45	0.27	1.64	0.33		
N formal educated	-0.32	0.17	-0.35	0.17	0.37	0.24
Richer wealth index	-0.14	0.22	-0.12	0.21	0.06	0.30
Richest wealth index	0.08	0.34	-0.07	0.32	0.39	0.38
Residence	-1.20	0.48	-1.04	0.44	0.03	0.52
Respondent children	-0.19	0.16	-0.16	0.15		
Partners formally educated	0.60	0.17	0.66*	0.16	0.51	0.23

Continued.

Variables	Univariate probit		RBP		Expose to FP message	
	Intention to use		Intention to use		Expose to FP message	
	Coeffecient	Std. error	Coeffecient	Std. error	Coeffecient	Std. error
Respondent working status	0.36	0.23	0.31	0.21	0.16	0.25
Desire to have more children	-0.14	0.30	-0.12	0.27		
Undecided to have children	-0.56	0.59	-0.54	0.56		
Household has radio	0.08	0.20	0.10	0.18	-0.24	0.25
Household has television	0.37	0.61	0.13	0.56	1.24	0.56
Mobile ownership	-0.29	0.24	-0.33	0.22	0.31	0.28
Use of internet in last 12 months	0.06	0.90	0.04	0.85	1.11	1.23
Health facility visit	0.22	0.16	0.12	0.15	0.51	0.19
Radio message	0.16	0.23			0.93	0.25
TV message	0.84	0.39			1.06	0.27
Magazine message	0.21	0.34			0.91	0.30
Constant	0.31	0.32	0.23	0.29	-1.90	0.24
Rho			-0.68	0.19		
Wald chi2			176.8			
Log likelihood			-311.3			
LR test			7.45			

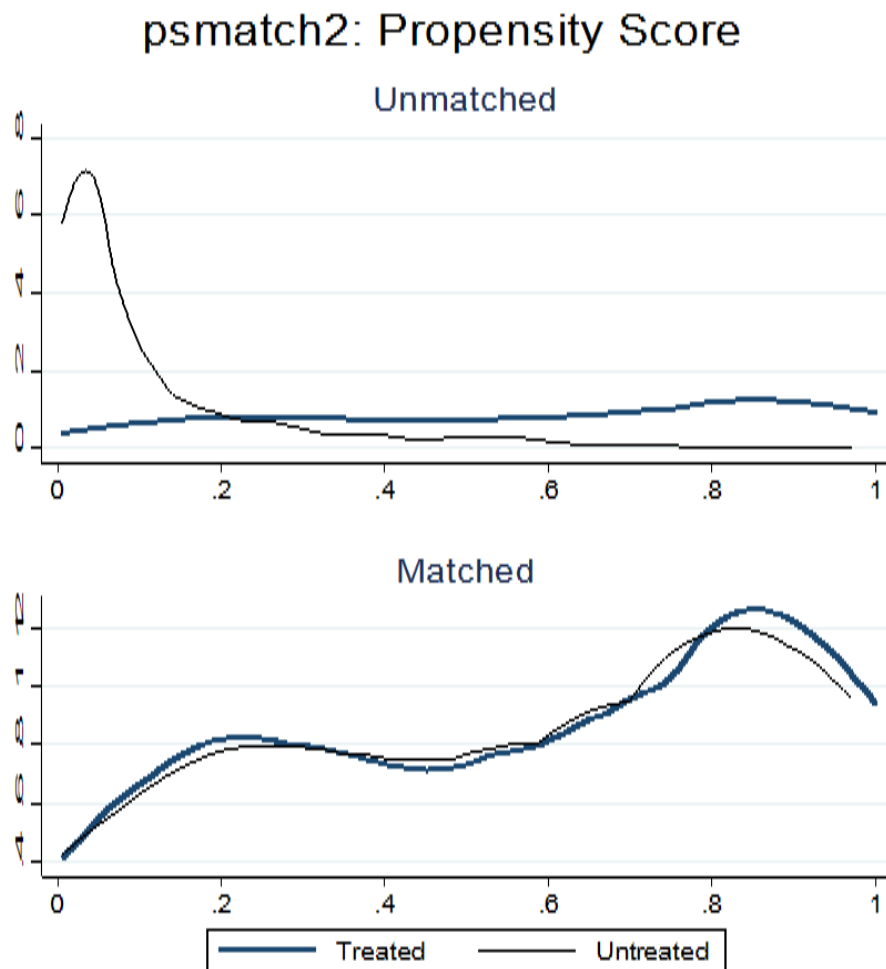


Figure 1: PSM of exposure to family planning message before and after matching.

Impact of mass media exposure on modern contraceptive utilization

PSM analysis

Treatment effect estimation based on psmatch2 estimation has output before matching and after matching. Unmatched estimate showed difference between average utilization modern contraceptive among mass media exposed and unexposed respondent before matching was arranged. After matching ATT, ATU and ATE on utilization of modern contraceptive utilization and intention to use for future was reported (Figure 1). As a result, those exposed to mass media family panning message had 16% and 18% more likely to utilize modern contraceptive and intention to use for future (Table 3).

Determinant of mass media exposure and contraceptive use

In this study both univariate probit and recursive bivariate probit model was used to estimate determinant of modern contraceptive use. Recursive bivariate probit model was better explaining the relationship than univariate probit model. The results of the recursive bivariate showed exposure to mass media message increased the probability of modern contraceptive utilization. Modern contraceptive utilization was significantly affected by mass media exposure to family panning message, richest wealth index and residence positively. But respondents who were not educated were negatively affected by modern contraceptive utilization. Exposure to mass media message about FP was significantly affected by presence of TV in household, exposé to TV message, expose to radio message, expose to magazine message, internet user and visit health facility (Table 4).

Similarly, for intention to use recursive bivariate probit model better explain model. Recursive bivariate probit model was better at explaining the relationship. Those respondents who were exposed to family planning message and partner education positively affected the intention to use modern contraceptive use (Table 5). Over all, the univariate probit model was insignificant in both outcome but recursive bivariate probit was significant to explain the outcome. Because of endogenous factor it exhibited different output so we used recursive bivariate probit to explain the relationship between exposed to family planning message and both outcomes.

DISCUSSION

This study assessed the influence of mass media on contraceptive behavior based on national representative data of EDHS 2016. Mass media can be used for promoting family planning program successfully.

Exposure to family panning message was low among adolescent married women. This was due to low accessibility of radio, TV, mobile and internet access.

Exposure to family panning message was associated with modern contraceptive utilization and the intention to use. This showed mass media availability was important to disseminate knowledge and attitude about family planning program.^{9,34}

The impact of exposure to mass media on modern contraceptive use and intention to use for future was assessed by using propensity score matching using four matching estimators after balancing of propensity score. Expose to family planning message had 16.8% and 14.2% more likely to use modern contraceptive and plan to use contraceptive for future by using KM.

The predictor of exposure to family planning message and modern contraceptive assessed by recursive biprobit model since univariate probit model was insignificant to explain the relationship. Recursive biprobit model result shows mass media exposure increases use and intention to use modern contraceptive. Factor associated with modern contraceptive utilization were exposure to mass media family planning message, residence, wealth index and educational level. In other side factor associated with intention to use for future include exposure to mass media family planning message, residence, educational level and partner educational level. Expose to mass media message about FP and associated factor for both utilization of modern contraceptive and intention to use for future by controlling covariant. It was supported by different previous research.^{35,36}

Educational level, household wealth index and place of residence significantly associated with utilization of modern contraceptive and it was supported by different study.^{37,38} Significant factor associated with exposure to family planning message included presence of radio in household, presence of TV in household, use of internet, health facility visit, frequently listing radio, frequently watching TV and frequently read magazine.

Frequently watching TV was strongly associated with exposure to family panning message. It increased the probability of hearing family planning message even more power full than other media. It was supported by other stud Nigeria and Central Asia.^{18,39} The possible explanation may be television was a powerful medium for appealing to mass audiences and reaches people regardless of age, sex, income or educational level. In addition, television offers sight and sound and made dramatic and lifelike presentations of people and products. We mostly believed what we saw rather than what we heard.³⁶

Frequently watching radio was second most important type of mass media that had strong relationship with exposure to family planning message. Previous studies indicated that radio was low cost to access and reach to mass audience. Radio was less efficient than television in transmitting message it might be because of TV has visual image. Radio increased public health messages

about family planning in detail.^{39,40} Frequency of listening to radio amongst married women in this study was lower than other developing countries.³⁵

Frequently read magazine significantly associated with family planning use especially it gave detailed health reporting that was not feasible with other media. It was detail, flexibility that can be read frequently and share to other.³⁵

Frequent use internet increased exposure to family planning message. The reason may be use of internet might retrieved information about family planning based on their interest.

Strength and limitation

Strength included DHS was national representative data that used multistate sampling technique. The DHS data was collected with international standard and trained data collectors. The data quality was assessed in different stage of data collection and entry process.

Limitation included that DHS was nonrandomized data and not included all variable needed for analysis of this study. As result of data were collected for survey the variable did not include nor needed some efforts to select the variable of interest. DHS dataset not included or incompleted of some of the variables focusing on mass media and family planning were incomplete or not filled as the will of the investigator.

CONCLUSION

This study assesses the impact of mass media exposure about FP on modern contraceptive practice. It showed exposure to mass media about FP message affect both utilization of modern contraceptive and intention to use for future.

This study suggests low prevalence of contraceptive utilization associated with lack of information about family planning. Since adolescent was under influence of partner and community to give appropriate information about family planning mass media has advantage. Therefore, policy maker and concerned body should consider mass media to integrate family planning program.

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