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The Effects of Internet Access on Contraceptive Use in Indonesia*

(Intercensal Population Survey Data Analysis of 2015)

Ihsan Nulhakim
Universitas Indonesia
Jakarta, Indonesia

Omas Bulan Samosir
Universitas Indonesia
Jakarta, Indonesia

***Abstract*—The success of family planning program is one of the factors contributing to the decline of fertility rate in Indonesia. Although the prevalence of contraception in Indonesia continues to increase, its growth from year to year continues to decline. Internet is a potential ICT media that can be used to promote family planning program. This study aims to investigate the effect of Internet access on the decision to use contraception in Indonesia. Using data from the Intercensal Population Survey (SUPAS) of 2015, a binary logistic regression is selected to study the effects of Internet access on decision to use contraception among married women aged 15–54 years who live with their partners in Indonesia. The results of this study show that after controlling for education level, working status, place of residence, and age, Internet access statistically makes significant positive effects to the contraceptive use in Indonesia.**

***Keywords—Fertility; contraceptive use; Internet; binary logistic regression; Indonesia*.**

I. INTRODUCTION

In general, fertility rate (TFR) in Indonesia from 1971 to 2015 had decreased, although in recent years stalled. Based on the results of population census (SP), fertility rate of Indonesia decreased from 5.61 births per women at childbearing age (SP1971) to 2.34 births per women at childbearing age (SP2000), and then increased to 2.41 births per women at childbearing age (SP2010) [1]. Meanwhile, based on the results of Intercensal Population Survey (SUPAS) of 2015, fertility rate of Indonesia decreased to 2.28 births per women at childbearing age [2]. This is of course a concern because the decline in fertility rate is an important factor for Indonesia to not lose momentum to reap the demographic bonus [3].

One of the proximate determinants that directly affects fertility is the use of contraception [4]. Meanwhile, the decline of fertility is influenced by the norms prevailing in a society. The norm about the size of the family and the intermediate variables are influenced by the level of mortality and socio–economic structures that exist in society. This will affect fertility directly through intermediate variables, one of which is contraception [5]. Furthermore, contraceptive use is one of four key factors affecting fertility, where the other three factors are marital behavior, breastfeeding behavior, and abortion behavior [6]. Of these four factors, in some developing countries, contraceptive use has the greatest effect on fertility [7].

One measure to see the achievement of family planning programs is the contraceptive prevalence rate (CPR). Based on the Indonesian Demographic and Health Survey (IDHS), CPR in Indonesia continues to increase, from 49.7 per cent on 1991 to 61.9 per cent on 2012 [8]. Although CPR in Indonesia continues to grow from year to year, but having examined closely it appears that the growth of CPR is slowing down. Contraceptive prevalence rates in Indonesia had increased to 5 per cent in the period of 1991–1994, but in recent period, the increase was just under 3 per cent [8]. Even in the period of 2007–2012, CPR only increased 0.5 per cent [8]. This is an alarming fact, given how the role of family planning program in reducing fertility rate in the past. Meanwhile, the government is targeting to increase contraceptive use up to 66 per cent by the end of 2019 [9]. Ministry of PPN/Bappenas suspected that the implementation of advocacy, and information, education and communication (IEC) of family planning program is not effective to disseminate messages about the importance of family planning program. Strengthening the advocacy, information, education and communication on Population, Family Planning and Family Development Program are necessary to do in the future [10].

In order to support strengthening the advocacy, information, education and communication on Population, Family Planning and Family Development Program, the role of information and communication technology (ICT) is important to be improved. The Internet is one of the ICT media that have rapid development at this time. Number of Internet users continues to increase, from 88.1 million Internet users or 34.9 per cent of total population in 2014 to 132.7 million Internet users or 51.8 per cent of the total population in 2016 [11]. Meanwhile, the number of males using Internet is much more than females', which is 52.5 per cent compared to 47.5 per cent [11]. The large number of Internet users could be an opportunity in the effort to disseminate the family planning program in Indonesia, because the Internet can contribute in increasing public knowledge [12]. The Internet can narrow the knowledge-gap between healthcare providers and the public [12]. On the other side, the Internet also risks in widening the knowledge gap between individuals who have access to the Internet and individuals who do not have access to the Internet [12].

Many studies have been done to explain how information and communication technology (ICT) influence the use of contraception, but commonly media used in those studies are television and radio. It is rare to find studies that review the role of the Internet on contraceptive use. Many studies using television or radio to examine how media influence on contraception resulted that ICT has positive effect on contraceptive use [13–18].

II. Literature Review

A. Family Planning Behavior

In demographic studies, knowledge, attitude, and practice (KAP) of family planning are important factors that influence (determinant) and are affected (consequence) by conditions of various aspects of development inherent in the regions or individuals. Contraceptive use is one part of family planning behaviors besides contraceptive choice, contraceptive failure, and contraceptive switching [19].

B. Internet

The Internet is one component of ICT. Information and communication technology (ICT) is defined as a tool that facilitates communication, processing and transmission of information and sharing of knowledge electronically [20]. It includes a comprehensive range of analog and digital ICTs, from radio, television, to (fixed and mobile) phones, computers and electronic–based media such as digital text, audio–video recordings and the Internet, social networking and web–based communities [20]. In relation to family planning programs, ICTs – especially the Internet – have the capacity to improve access to family planning information and reproductive health, and health services for women, men and youth; with the potential to improve their health status and quality of life [21]. In disseminating information to the public, the Internet has the advantages of being more cost–effective and capable of reaching large numbers of people with important information. The types of information conveyed can include the availability of care services, information hotlines and websites [22].

In the field of health, the Internet plays a role in narrowing the knowledge gap between healthcare providers and the public but also brings the risk of widening the knowledge gap between individuals who have and do not have access to the Internet [23]. Through the Internet, health information can be obtained more easily, quickly, and efficiently so it is always the first choice after a doctor [24]. This is because the ICTs, especially the Internet, is more efficient in delivering the health information and other health messages than direct health campaigns [25]. While from a gender perspective, women are more likely to seek information about health than men [26, 27].

C. Internet and Process of Family Planning Behavior Change

Diffusion of innovations theory can be used to explain the process of behavior change in individuals and a community occurs [28]. Diffusion of innovations theory consists of 4 main elements: (1) innovation must exist, (2) communication channels are required, (3) the process takes time, and (4) the social system will eventually change [28]. In the context of behavioral change to use contraception, the role of the Internet is very important to convey information about the innovations offered by family planning programs, both benefits and side effects, through available communication channels. The theory divides the process of adoption of innovation into 5 stages; those are: knowledge, persuasion, decision, implementation and confirmation [28]. In the process of changing the behavior of family planning, the Internet plays an important role in providing information about contraception at every stage, but the role of the Internet is more dominant in the first stage when building the knowledge, while the interpersonal approach will be more dominant in the second stage, which is the stage of persuasion [28].

III. Method

Using data from the Intercensal Population Survey (SUPAS) of 2015, a binary logistic regression is selected to study the effect of Internet access on decision to use contraception. The unit of analysis in this study is married women aged 15–54 years and living with their spouses/husbands all over Indonesia. After sorting the data based on these limitations, finally it is found 434,876 married women as sample. Table I illustrates the operational definitions of the dependent variable, the main independent variable and the control variables that are used in this study.

TABLE I. Operational Definitions of Variables

Variables	Operational Definitions	Categorical Scales
Dependent Variable		
Status of contraceptive use (PAKAI_KB)	Respondent status of contraceptive use	0. Not using contraception 1. Using contraception
Main Independent Variable		
Internet access (INTERNET)	Respondent status of Internet access	1. Yes 2. No
Control Variables		
Educational level (DIDIK)	Respondent highest level of education attained	1. Elementary school graduated 2. Junior high school graduated 3. At least senior high school graduated
Working status (STA_KERJA)	Respondent working status	1. Working at formal sector 2. Working at informal sector 3. Not working
Area of residence (DTT)	Respondent classification of residence area	1. Urban area 2. Rural area
Age (UMUR)	Age of respondent	1. 15–24 years 2. 25–34 years 3. 35–44 years 4. 45–54 years

Source: Authors.

The dependent variable in this study is the status of contraceptive use by married women in Indonesia. Married women are said using contraception if they use certain methods to prevent pregnancy, either modern contraceptive methods, such as injection, IUDs, pills, condom, or traditional

contraceptive methods [29]. The main independent variable in this study is the status of Internet access. Married women are said to have internet access if they are using Internet in the last 3 months, whether it's for browsing, Facebook, Twitter, WhatsApp, BBM, online games, Skype, etc [29]. This study also used control variables, i.e. the level of education, working status, area of residence, and age of respondents.

The inferential model used in this study is as follows.

$$\ln\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \beta_1 \text{int}\, ernet + \beta_{21} didik(1) + \beta_{22} didik(2)$$
$$\beta_{31} sta\_\text{ker}\, ja(1) + \beta_{32} sta\_\text{ker}\, ja(2) + \beta_4 dtt$$
$$+ \beta_{51} umur(1) + \beta_{52} umur(2) + \beta_{53} umur(3) + \varepsilon \quad (1)$$

Where

π : Probability using contraception

1- π : Probability not using contraception

IV. Result and Discussion

A. Descriptive Analysis

Table II shows distribution of samples by background characteristics. From the table, most of married women use contraception to prevent conception. Percentage of married women who are using contraception is higher than married women who do not use contraception, 55.5 per cent versus 44.5 per cent respectively. Viewed from Internet access, married women who become samples mostly do not access Internet in the last 3 months, either for browsing, Facebook, Twitter, WhatsApp, BBM, online games, Skype, etc (79.0 per cent). When samples are viewed by level of education, married women who graduated from elementary school have the highest percentage, and the lowest percentage is married women graduated from junior high school. Meanwhile, married women who do not work dominate the sample in working status category (53.0 per cent). Talking on the area of residence, samples of married women who live in rural areas are more than those living in urban areas. Meanwhile when samples are viewed by age, it results reversed 'U' pattern with its peak at the age of 35–44 years.

TABLE II. Distribution of Samples by Characteristics

Characteristics	Frequency	Percentage
Status of contraceptive use		
Using contraception	241,271	55.5
Not using contraception	193,605	44.5
Internet access		
Accessing Internet	91,121	21.0
Not accessing Internet	343,755	79.0
Educational level		
Elementary school graduated	195,889	45.0
Junior high school graduated	92,726	21.3
At least senior high school graduated	146,261	33.7
Working status		
Formal sector	65,074	15.0
Informal sector	139,453	32.0
Not working	230,349	53.0
Area of residence		
Urban area	179,702	41.3
Rural area	255,174	58.7
Age		
15–24 years	44,385	10.2
25–34 years	139,752	32.1
35–44 years	147,814	34.0
45–54 years	102,925	23.7
Total	434,876	100.0

Source: Computed from Intercensal Population Survey of 2015

TABLE III. Background Characteristics of Contraceptive Use

Characteristics	Using Contraception (per cent)			Frequency
	Yes	No	Total	
Internet access*				
Accessing Internet	53.2	46.8	21.0	91,121
Not accessing Internet	56.1	43.9	79.0	343,755
Educational level*				
Elementary school grad.	53.9	46.1	45.0	195,889
Junior high school grad.	61.7	38.3	21.3	92,726
At least senior high school graduated	53.6	46.4	33.7	146,261
Working status*				
Formal sector	53.8	46.2	15.0	65,074
Informal sector	54.3	45.7	32.0	139,453
Not working	56.7	43.3	53.0	230,349
Area of residence*				
Urban area	53.7	46.3	41.3	179,702
Rural area	56.7	43.3	58.7	255,174
Age group*				
15–24 years	54.1	45.9	10.2	44,385
25–34 years	61.6	38.4	32.1	139,752
35–44 years	63.6	36.4	34.0	147,814
45–54 years	36.0	64.0	23.7	102,925
Total	55.5	44.5	100.0	434,876

Source: Computed from Intercensal Population Survey of 2015

Note : * Chi–square test significant at p < 0,05.

Cross–tabulation results between main independent variables and dependent variable are shown on Table III. Contraceptive use on married women who access the Internet is lower than on married women who do not access the Internet, 53.2 per cent versus 56.1 per cent respectively. If contraceptive use is viewed by the level of education, the highest percentage of contraception use is on women who graduated from junior high school and the lowest use of contraception is on women who at least completed high school. The percentage of contraceptive use on married women who are working in the formal sector is the lowest compared to other categories. When it is viewed by the area of residence, the percentage of contraceptive use on married women who live in rural areas is higher than married women who live in urban areas. If contraceptive use is viewed by age, it is seen that the highest percentage of contraceptive use is on married women aged 35–44 years, then followed by married women aged 25–34 years and 15–24 years. Specifically for married women aged 45-54 years, the percentage of those who do not use contraception is higher than using contraception.

Meanwhile, cross tabulation results between the control variables and the main independent variable shows that the highest percentage of the Internet access is on married women

who finished senior high school and above, working in the formal sector, living in urban areas, and aged at 15–24 years.

B. Inferential Analysis

To identify the influential factors of contraceptive use, the binary logistics regression has been employed, and the results are presented in Table IV. The result shows, as expected, that Internet access has positively and significantly associated with the use of contraception. Women who access Internet show 1.215 times more likely to use contraception than those who have no Internet access (reference category).

TABLE IV. PARAMETER ESTIMATES, WALD TEST STATISTICS, SIGNIFICANCE, AND ODDS RATIO OF BINARY LOGISTIC REGRESSION MODEL

Covariate	Parameter Estimates	Sig.	Wald	Odds Ratio
Constant	0,508***	0,000	3.748,052	–
Internet Access				
Accessing Internet	0,195***	0,000	444,207	1,215
Not Accessing Internet	–	–	–	Ref
Educational Level				
Elementary school graduated	–	–	–	Ref
Junior high school graduated	–0,178***	0,000	425,984	0,837
At least graduated from high school	0,072***	0,000	70,233	1,075
Working status				
Formal sector	0,004	0,697	0,152	1,004
Informal sector	0,062***	0,000	72,694	1,064
Not working	–	–	–	Ref
Area of residence				
Urban area	0,059***	0,000	73,457	1,061
Rural area	–	–	–	Ref
Age				
15–24 years	–0,738***	0,000	3.711,148	0,478
25–34 years	–1,066***	0,000	14.415,692	0,344
35–44 years	–1,138***	0,000	17.751,790	0,320
45–54 years	–	–	–	Ref

Source: Computed from Intercensal Population Survey of 2015

Notes : *** Significant at p < 0,00; ** Significant at p < 0,01; * Significant at p < 0,05.

From these findings, it can be interpreted that there are differences in contraceptive use between married women who access the Internet and married women who do not access the Internet. The coefficient value is marked positive; that means married women who access the Internet are more likely to use contraception than married women who do not access the Internet. This finding is in line with the results of previous researches on the effects of ICT on contraceptive use [16-18]. This is possible because the Internet plays an important role in providing the information needed in every stage of the process of behavioral change of family planning, in this case the use of contraception, especially in the early stages of the building the knowledge, such as diffusion of innovation theory proposed by Rogers [28]. The Internet is able to provide information on contraception more efficient than other media. [25] So it is natural that the Internet becomes the primary reference of health information if someone can not directly consult with a physician [24]. In addition, one advantage of the Internet compared to other ICT media such as television and radio is the ability of the Internet to conduct two–way interaction [20], so that responses obtained by information seekers are more complete and detailed. This will eventually be able to become competent information as a basis for retrieval decision on contraceptive use.

The level of education also has a significant association with decision to use contraception on married women. This means that there is a difference in contraceptive use depending on the educational level of married women. However, the results differ between married women who graduated from junior high school and married women who graduated from senior high school and above. On married women who graduated from junior high school, there is a lower risk to use contraception than married women who only finished elementary school. Probability to use contraception on married women who completed junior high school is 0.837 times married women who completed elementary school. In other words, married women who only finished elementary school have a higher probability to use contraception than those who graduated from junior high school. Meanwhile, married women who graduated from senior high school and above have a higher risk to use contraception than married women who finished elementary school. The risk of married women who graduated from high school and above to use contraception is 1.075 times than married women who only finished elementary school.

Viewed based on working status, the results differ between categories tested. On married women working in the informal sector, the results show a significant positive effect on contraceptive use. Meanwhile, on married women working in the formal sector, the results show that statistically there is no significant effect of working status on contraceptive use. This may be due to working married women (in the informal sector) are having access to better information about family planning programs and knowing much about the benefits of family planning programs rather than unemployment married women. In addition, married women who work tends to have a wider association; so that access to information about contraception obtained is not only limited to the promotion of family planning only but also from colleagues or people around them who have experienced directly the use of contraception.

The area of residence also has significant effect on contraceptive use. Married women living in urban areas are more likely to use contraception than married women living in rural areas. This finding is in line with the findings of previous studies [17, 30]. This is due to the more complete facilities available in urban areas. In terms of information, married women living in urban areas have easier access to information than married women living in rural areas, such as the availability of Internet coverage anywhere, so the exposure of information on family planning programs is likely higher for those living in urban areas which will ultimately raise awareness of the importance of family planning programs. In addition, the adequate infrastructure is also more complete in urban areas; thus, make it easier for women to reach the location of health facilities providing contraceptive services and a more complete variety of contraceptive options.

Meanwhile, the age of women also has significant effect on decision to use contraception. Married women aged at 15–24

years using contraception is 0.478 times to married women aged at 45–54 years. Married women aged at 25–34 years will have a tendency of 0.344 times to use contraception compared to married women aged at 45–54 years. While in married women aged at 35–44 years, the tendency to use contraception is 0.320 times to married women aged at 45–54 years. This means probability to use contraception is higher on married women aged at 45–54 years than married women aged at 15–24 years, 25–34 years, and 35–44 years. Or in other words, older married women will be more likely to use contraception than younger ones. This is possible because along with the age of married women the desire to have more children will decrease so that they will try to limit the birth in various ways, one of which is by using contraception.

V. CONCLUSION

The objectives of this study are to show the impact of Internet access on contraceptive use and to identify the factors associated with the current use of contraception. The findings provide support that the Internet access, level of education, working status, area of residence and age of respondents are associated with the use of contraception.

Internet is effective for promoting the use of contraception that currently stalled. The findings reveal that the Internet has a potential role in disseminating messages about family planning program and should be maximized to increase the contraception prevalence rate in the future. This will help BKKBN to boost the increase in contraseptive use and therefore decline the fertility rate.

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