

Exploring Behavioral Determinants of Women Who Had an Abortion in Java, Indonesia

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Abstract. Stigma on abortion has limited the study of abortion in several countries, including Indonesia. Understanding factors of abortion can improve programs and policies aimed at increasing women's sexual and reproductive health and rights, especially abortion. This study aims to draw a picture of the behavioral determinants of women who had abortions. This cross-sectional study utilized data from a community-based survey of 8,969 randomly selected women aged 15-49 in six provinces in Java. Data were collected via an interviewer-administered structured questionnaire, collecting information on socio-demographic characteristics, experience using contraception, pregnancy, abortion, partner violence, and other issues related to reproductive health. Structural Equation Modeling Analysis was used to get an overview of the structural determinants of women who had abortions based on the concept of Integrated Behavioral Model Theory. Model fit with RMSEA value = 0.037, CFI = 0.924, and SRMR = 0.048. Intention shows the most significant direct effect on abortion. The experience of physical and sexual violence, the attitude toward the impact of ending pregnancy, and the lack of contraception knowledge have a direct effect on increasing the intention to have an abortion.

1 Introduction

Abortion is a susceptible issue in Indonesia. It is highly related to the prohibition of having an abortion, both legally and religiously. Legal law in Indonesia only allows abortion on indications of medical emergencies and rape victims. In the section on reproductive health in the 2009 Health Law, article 75 states that it is prohibited for everyone to have an abortion (paragraph 1), but two groups can be excluded (patients of medical emergencies and rape victims). However, until now, the two groups often find it difficult to access safe abortion services. Since abortion has a negative stigma and is prohibited from being practiced in Indonesia, the procedure of unsafe abortion still occurs and is likely to contribute to the high maternal mortality rate in Indonesia.

The maternal mortality ratio in Indonesia is still high compared to the average ratio in Southeast Asia. The estimated maternal mortality ratio in Indonesia in 2015 was 305 per 100,000 live births [1]. Unsafe abortion can cause various health problems for women, such as near-missed cases due to heavy bleeding, infections, and unsafe abortion methods, which can lead to death [2,3]. Unsafe abortion accounts for about 16-28% of maternal deaths in Southeast Asia [4]. From 2010 to 2014, the average number of abortions was estimated to be 35 per 1,000 Women of Child-Bearing Age (WCA) each year. The estimated range of abortion rates for Southeast Asia was between 25-64 per

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1,000 WCA [5,6]. The study results on the incidence of abortion in Java estimate that the abortion rate in 2018 was 42.5 per 1,000 WCA (15-49 years) [7].

Unwanted pregnancy is one of the forceful reasons women have an abortion. About 40% of pregnancies in the world are unplanned [8] as the result of not using contraception, and ineffective or failure of contraception. Although there was an increase in the proportion of contraceptive use in 2017, there was no significant increase in the proportion of use of modern contraceptives. Modern contraceptives had decreased slightly from 58% in 2012 to 57% in 2017. The trend of unmet need for contraception was also fairly stagnant from 2012 to 2017 at 11% [9]. The studies show the risks for an increased incidence of unwanted pregnancy, which can lead to abortion. It is predicted that three out of four pregnancies from unsafe abortion can decrease if the need for family planning (FP) is met [10]. Increasing the CPR and the effectiveness of contraceptives can reduce the incidence of abortion [11].

Studies related to health behavior examine determinants of health behavior based on the Behavioral Model Theory. Behavioral Model Theory is able to describe social, environmental, and individual factors that can be used in understanding and predicting determinants of behavior. The Theory of Reasoned Action (TRA) and The Theory of Planned Behavior (TPB) are behavioral theories that can specifically explain causality to predict behaviors and have standard measures for analyzing theory constructions. The Integrated Behavioral Model (IBM) was developed to integrate several theories, such as TRA and TPB, in assessing health behavior by considering environmental and knowledge factors.

The concept of behavioral theory related to reproductive health through structural models has been widely used. However, specific studies on sensitive issues such as abortion are scarce, especially in Indonesia. Studies on sensitive issues sometimes only look at an overview of the factors related to behaviors, such as socio-demography or other factors measured based on a single question due to limited data and information sources. IBM's theoretical concepts can identify empirically the factors that should be focused on intervention efforts [12].

This study uses the 2018 Community-Based Survey data in Java that describes the characteristics of women who have had abortions and investigates the determinants of abortions. Furthermore, this study is expected to be able to provide information on the conditions of the factors that can directly or indirectly influence women to decide an abortion. Understanding the results of a study on abortion in Java, where around 60% of Indonesia's population is located, would provide information that projects an overview for strengthening reproductive health promotion programs and reducing maternal mortality, especially on sensitive issues such as abortion.

2 Method

2.1 Samples and data collection

This cross-section study was conducted in six provinces in Java, Indonesia: Jakarta, West Java, Central Java, Yogyakarta, East Java, and Banten. Multi-stage cluster sampling was used in the 2018 Community-Based Survey. In the first stage, 35 villages were selected in each province using a probability proportional to size (PPS) based on the total population in each village. In each selected village, 3 *Rukun Tetangga* (RT) or neighborhood associations were taken randomly. In each selected RT, the enumerator listed each household to obtain information on the gender and age of each family member. Households that matched the criteria were those who had at least one woman of reproductive age from 15 to 49 years. After listing, 13 households were randomly selected in each RT. A maximum of two women of reproductive age will be interviewed in each household. The sample used in the

analysis was women aged 15-49 years who had had sexual intercourse with a total of 6,780 respondents.

2.2 IBM theory framework

The Integrated Behavioral Model (IBM) combines the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviors (TPB) (see Figure 1.)IBM states that even though a person has a solid motivation to perform a particular behavior, it requires skill or knowledge to perform the behavior. Environmental factors also make this behavior possible or not. The importance of the behavior for a person also influences the intention of the behavior. Finally, the experience of performing a behavior can make it a habit so that the intention becomes less critical in determining the behavior. For example, someone who does not want to become pregnant will use specific methods to terminate the pregnancy. In order to select and use a particular method, knowledge is needed regarding the types of procedures that will be used.

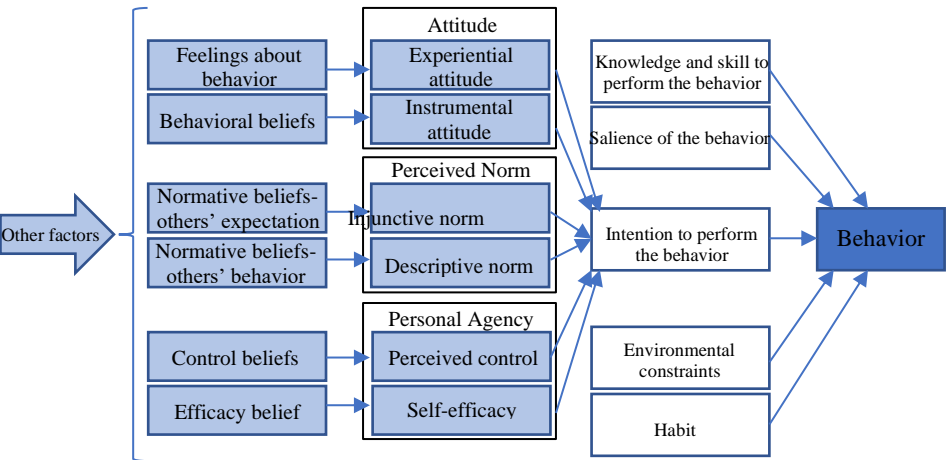


Figure 1. Integrated Behavioral Model Theory

The general approach often used to analyze TRA/TPB and IBM is structural equation modeling (SEM). SEM is used to see the relationship between TRA/TPB and IBM through a technical language that can classify theoretical components with precision [13,14] and provide statistical models such as multiple variances in path analysis to perform empirical analysis [15]. Although not all TRA/TPB/IBM theory analyses use SEM, SEM is often used to answer more complex questions and measure latent variables. SEM is also frequently performed in cross-sectional studies, and data from longitudinal studies better assess the effect of causality by using SEM [12,15].

2.3 Study Framework

The conceptual framework for the structural model of women who had had an abortion was made based on IBM theory and adjusted to the availability of data in the 2018 Community-Based Survey data (see Figure 2.)

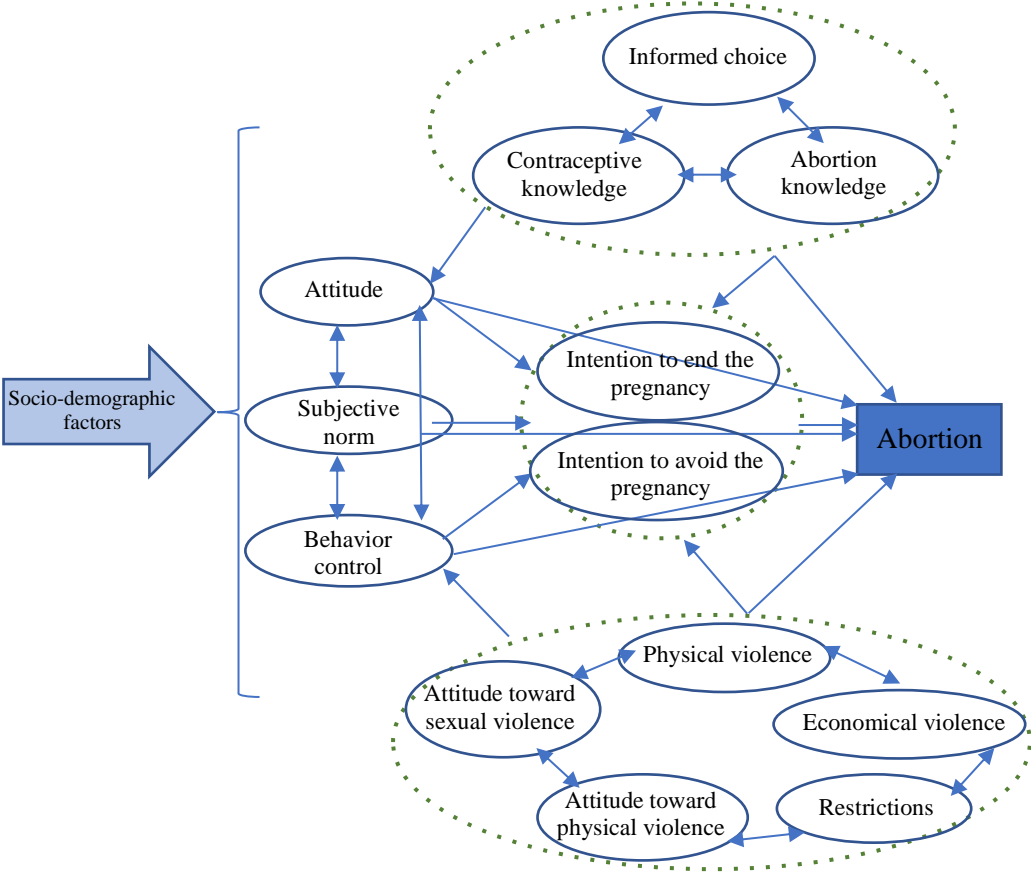


Figure 2. Study Framework

2.4 Definition of Variables

Variables used in this analysis are presented below (see Table 1).

Table 1. Definition of Variables

Variable	Definitions	Measurement
Abortion	Women admitted that they used some methods to bring back their late menstrual periods or terminated their pregnancies in the five years prior to the survey.	Six questions measure abortion: bringing back late menstruation; the thought of pregnancy when bringing on late menses; methods used to bring back menses; methods used to end a pregnancy; successful end of a pregnancy; and the number of successful pregnancy termination. The variable coding with a low score of 1 is positive behavior that leads to not having an abortion, and the greater score indicates the behavior that leads to abortion. All items are indexed using PCA.
Intention	Intention to have an abortion is defined as the action of a woman that leads to doing something to delay or avoid pregnancy and the intention to terminate the pregnancy.	Intention to avoid pregnancy is measured through these question items: the feeling of knowing she was pregnant; the state of being pregnant when she does not want to get pregnant; the importance of delaying pregnancy; and the efforts made to avoid pregnancy. The intention to terminate a pregnancy is measured by considering acts to end the pregnancy and the method used to avoid it.
Attitude	A description of a woman's attitude toward abortion is illustrated by how she reacts when she knows that she is pregnant and her attitude towards abortion behaviors.	Attitude is measured through four question items: the feeling of knowing that she was pregnant; the feeling of ending a pregnancy; the worry about people's negative judgment on ending a pregnancy; and the value of abortion.
Subjective norm	Normative beliefs of what a person thinks about most people's perceptions of abortion and perceptions of whether or not the social environment performs abortion.	It is measured through six question items: having a discussion about abortion with friends potentially; having friends who use any methods to avoid pregnancy; having friends who have terminated a pregnancy; the number of friends who have ended pregnancy; having trusted friends in ending the pregnancy; getting supports from the

		family/friends/relatives to end the pregnancy.
Control behavior	A perception of avoiding pregnancy or having an abortion with ease or difficulty.	Three questions measure it: the current use of any methods to avoid pregnancy; the ease of asking a partner not to have sex; and the ease of asking a partner to use methods to avoid pregnancy.
Knowledge and skills	Knowledge and skills in understanding contraceptive methods to avoid pregnancy. Knowledge is divided into the knowledge of contraception, the knowledge of abortion, and the informed choice of family planning (FP).	Contraceptive knowledge is measured by having heard of the contraceptive methods, the side effects, and the control of side effects. Abortion knowledge is measured through the knowledge of abortion laws in Indonesia. Skills are assessed based on the exposure to informed choice by health practitioners.
Environment factors	Environmental conditions that can impact a woman on having an abortion. It is described through the feeling of contact with people who can support in taking control of the abortion. In this case, the variable is experiencing verbal, physical, and sexual violence by her partner.	It consists of 6 (six) questions measuring attitudes towards physical and sexual violence, 10 (ten) questions about the experience of physical and sexual violence, 6 (six) questions about restrictions, and 3 (three) questions about economic violence. The higher score indicates a more negative environment.

2.5 Statistical Analysis

This study aims to test the model and the hypothesis of the factors that influence abortion based on the Integrated Behavioral Model theory. SEM analysis was used in relation to the TRA / TPB and IBM [13,14]. The data analysis used STATA [16]. The general characteristics of the informants and each research variable were presented using descriptive statistics and simple linear regression. Simple linear regression was used to examine the statistical relationship between general characteristics and abortion.

The correlation between study variables was analyzed using Pearson's correlation coefficient as the basic assumption of structural equations. SEM analysis is carried out in several stages: the development of a model based on a conceptual framework; the identification of parameters; the parameter estimation to convert as a standardized model; and the measurement to determine the model fit. Several indicators of Goodness of Fit were used, including RMSEA (Root Mean Square Error of Approximation) <0.05, CFI (Comparative Fit Index) > 0.90, SRMR (Standardized root mean squared residual) < 0.08; model modification that can be seen based on the highest value of modification indices; and interpretation of the final model.

3 Result and discussion

3.1 Measurement Model of Abortions

Abortion as the dependent variable is measured from related indicators. The abortion variable was formed into one observed variable using the PCA score. The higher the score, the more likely it was to lead to an abortion. The Pearson's correlation between the items formed could explain 83.6% of the existing variations. All indicators had a Cronbach's Alpha score of 0.713.

After selecting a sample that only included women who had had sexual intercourse, the final total was 6,780 women. The data above shows that 8.5% of women brought back their late menstrual period. However, only 27 women (0.4%) successfully end their pregnancies. The sensitive questions related to abortion were difficult to answer through direct interviews, so they tended to be unreported. Some literature mentioned that the assumption of normality was needed in SEM analysis. In contrast, the others stated that Maximum Likelihood and Generalized Least Square could work well on samples of more than 2,500. In this study, the number of samples exceeded 2,500, meaning the assumption could be tolerated.

3.1.1 *Characteristics of Women Who Had an Abortion*

The results showed that the age of the respondents was dominated by women 30 years and over, and there were only 0.8% of women aged 15-19 years. Based on marital status, 89% of women were married, and 0.2% had never been married. There were 65.7% of women who had had 1 to 2 children. Based on economic status, more women were in the poorest category (22.5%) than the richest category (17.3%). Women with the highest level of education were the lowest (9.7%), while those who did not finish junior high school had the highest percentage (26.2%). Meanwhile, working and non-working women seem quite balanced based on their employment status, with the percentage of working women as much as 50.8%.

Based on simple linear regression coefficients, there was no statistical relationship between age, marital status, economic status, education, and employment status with abortion experience. However, based on the marital status, the unmarried women had a fairly high coefficient compared to the married women. Based on the parity, it can be seen that the experience of abortion was higher for women who had more than three children compared to women who had not had children.

Women who had more than three children were more likely to experience abortion than women who had not had children. In a study in Nigeria, women who had had enough children were 2.3 times more likely to have unwanted pregnancies than women who had not had children. Abortion can be related to psychological effects on readiness to have more children, including conflicts that occur in the family [17,18,19].

Table 2. Characteristics of Respondents

Characteristics	n=6,780	%	Abortion			
			Coef.	95%CI		
Age (year)						
- 15-19	52	0.8	-	-	-	
- 20-29	1,527	22.5	0.034	-0.075	0.142	
- 30-39	2,645	39.0	0.087	-0.026	0.201	
- 40-49	2,556	37.7	0.087	-0.026	0.201	
Marital Status						
- Married by formal law	6,084	89.7	-	-	-	
- Informal married	216	3.2	0.051	-0.026	0.101	
- Currently in a non-	466	6.9	-0.038	-0.059	0.237	
marital	13	0.2	0.318	-0.445	1.157	
- Unmarried						
Parity						
- 0	407	6.0	-	-	-	
- 1-2	4,449	65.7	0.044*	0.003	0.085	
- ≥3	1,919	28.3	0.178*	0.112	0.244	
Economical status						
- Poorest	1,502	22.5	-	-	-	
- Poor	1,376	20.6	0.024	-0.027	0.075	
- Middle	1,388	20.8	0.111	0.043	0.177	
- Rich	1,246	18.7	0.045	-0.013	0.103	
- Richest	1,153	17.3	0.071	0.015	0.126	
Education						
- No education	987	14.6	-	-	-	
- Completed primary	1,598	23.6	0.011	-0.058	0.079	
- Incomplete secondary	1,774	26.2	0.026	-0.025	0.078	
- Completed secondary	1,761	25.9	0.052	-0.008	0.112	
- Higher education	660	9.7	-0.021	-0.093	0.053	
Employment status						
- Not working	3,337	49.2	-	-	-	
- Working	3,443	50.8	0.014	-0.025	0.052	

3.1.2 Structural Model of Women Who Have Had an Abortion

The model fits the indicators with RMSEA= 0.037; CFI= 0.924, and SRMR= 0.048. The variables that significantly correlated to abortion are presented in Figure 3. In the structural model, the intention was directly correlated to the abortion (0.176). In addition, the knowledge of contraceptives, the violence, and the restrictions were also positively correlated to abortion. In the structural model of intention, the variables of attitude, the subjective norm, contraceptive knowledge, violence, and restriction were also positively correlated to the intention.

In contrast, informed choice was negatively correlated to the intention (-0.065). The experience of violence by women was the direct factor that had the most significant impact on the intentions, with a coefficient of 0.098. The attitudes to physical violence (0.075) and the attitudes to sexual violence (0.059) were also positively correlated to the structural model of attitudes toward abortion. The details of direct and indirect effects are presented in Table 3.

Table 3. Direct and Indirect Effect of Structural Model

Endogenous variables	Exogenous variables	P-value	Direct effect	Indirect effect	Total effect
Abortion	Intention	0.001	0.176*		0.176*
	Attitude	0.001		0.017*	0.017*
	Subjective norm	0.001		0.005*	0.005*
	Low contraceptive knowledge	0.035	0.022*	0.013*	0.036*
	Uninformed choice of FP	0.252	0.011	-0.013	-0.002
	Attitude toward physical violence	0.477	0.007	0.001	0.009
	Attitude toward sexual violence	0.372	-0.009	0.001	-0.008
	Restrictions	0.001	0.039*	0.012	0.051*
	Experienced physical and sexual violence	0.003	0.029*	0.018	0.047*
	Experienced economic violence	0.608	0.008		0.008
Intention	Attitude	0.001	0.099*		0.099*
	Subjective norm	0.056	0.031*		0.031*
	Low contraceptive knowledge	0.001	0.073*	0.001	0.074*
	Uninformed choice of FP	0.001	-0.066*	-0.003	-0.069*
	Experienced physical and sexual violence	0.001	0.101*		0.101*
	Restriction	0.001	0.068*		0.068*
	Attitude toward physical violence	0.001		0.006*	0.006*
	Attitude toward sexual violence	0.001		0.007*	0.007*
Low contraceptive knowledge	Uninformed choice of FP	0.011	-0.039*		-0.039*
Attitude	Low contraceptive knowledge	0.360	0.015		0.015
	Attitude toward physical violence	0.001	0.059*		0.059*
	Attitude toward sexual violence	0.001	0.075*		0.075*
	Uninformed choice of FP	0.387		-0.001	-0.001

3.1.3 Direct Effect

The final structural model of abortion shows that intention is strongly correlated with abortion (direct effect= 0.176). The intention is influenced by attitudes, subjective norms, knowledge, and environmental factors. Many studies have stated that intention is a strong predictor of the occurrence of a behavior. In this study, the intention to have an abortion is described through the intention to avoid pregnancy and the intention to end the pregnancy. A total of 45-65 women per 1,000 WCA experienced unwanted pregnancies during 2010-2014, and 56% of unwanted pregnancies ended in abortion [6]. Unwanted pregnancies can be prevented through the use of contraception. It is predicted that three out of four pregnancies from unsafe abortion may be reduced if family planning needs are met

[10].

Contraceptive knowledge is statistically correlated to abortion. Family planning knowledge and informed choice are statistically associated with intentions. Low knowledge of contraceptives is described by never having heard of injection, pills, and Intrauterine Device (IUD) methods of family planning. There is also a lack of consideration that birth control might have serious side effects, such as heavy bleeding, and causes health problems that are more severe than bleeding. For instance, a study in Ghana that explores the relationship between knowledge of contraceptives and abortion experience showed that abortions tend to occur in women who do not have good knowledge of contraceptives, including rumors of side effects to personal negative experiences with modern contraceptive methods [20].

Restrictions and physical violence are statistically related to intention and abortion. It is in line with several studies in Nigeria, Bangladesh, and Uganda, which found that women with experiences of partner violence tend to have experiences terminating their pregnancy compared to women who do not experience partner violence [21,22,23]. Partner violence can increase the likelihood of an unwanted pregnancy by influencing pre-pregnancy desire, preparation for pregnancy, and adaptation to pregnancy [24]. and can lead to possible termination of pregnancy [23]. An abusive partner can influence contraceptive use decisions [21], and in the event of pregnancy, may exhibit violent actions to control pregnancy outcomes in an attempt to force women to end the pregnancy [25].

3.1.4 Indirect Effect

Having an attitude of not worrying about the impact of ending a pregnancy affects increasing intention to have an abortion. Women who have a strong intention to have an abortion tend to have a more liberal, more permissive, and have freedom of expression [26]. A study in Zambia found that although 88% of women agree that abortion is immoral, women have their full right to terminate their pregnancies [27].

Subjective norms have a positive effect on the intention to have an abortion. Women who are in a social environment that is more open to abortion tend to be more accepting of abortion behavior. This condition is commonly found in women living in urban areas [23]. The established norms have an important role in reproductive health behavior and decision-making, including in the context of unwanted pregnancy [28].

Unexposed informed choice has a negative effect on intention and knowledge of contraceptives. The unexposed informed choices of family planning are described as women who ever used them and are currently using family planning with the limitation to access more specific information related to the various side effects, how to cope with the effects and the choice of other contraceptive methods. This negative effect shows that although the women have or are currently using family planning methods without receiving informed choices of family planning services, they will reduce the intention to have an abortion due to the use of contraceptives. For instance, there are 19% of contraceptive users experiencing pregnancy due to incorrect or irregular contraceptive use [29]. In contrast, the low prevalence of contraception and the ineffectiveness of contraceptive methods can increase the incidence of unwanted pregnancies leading to abortion [20,30]. Hence, abortion can be avoided when women understand how to control pregnancy through the proper use of

contraception.

3.1.5 Limitations

This research was conducted by direct interviews with respondents using an online questionnaire data kit on an Android tablet. The participation rate of this survey was 95%. Research on reproductive health and specifically on abortion is a very sensitive issue, and there was a tendency for women to find it difficult to admit their abortion experiences honestly. Therefore, the resulting data is considered underreported, with minimal direct answers related to the abortion experience.

The questionnaire used in this study had been tested and applied to similar studies in several countries and adapted to the Indonesian context. However, the questionnaire in this study was not designed for the SEM analysis method. In several studies that test the TRA/TPB/IBM theoretical model, researchers designed specific questions that could measure certain indicators using a bipolar likelihood measurement score scale such as agree-disagree, difficult-easy, and good-bad scales [12]. The researcher conducted a review to understand every question in the questionnaire and made a match with the existing theory. Several computations, grouping, and the re-code of variables were carried out to suit the theory and research concepts. However, this limitation affects the model's suitability to be formed, so the hypothetical model cannot be formed optimally.

SEM regression and analysis are often used in cross-sectional studies to test the TRA/TPB/IBM theoretical model. However, it is better to use longitudinal data to see the causal effect more clearly [12,15]. Longitudinal data are very limited in Indonesia and other countries in general, especially in research related to sensitive issues such as abortion and reproductive health. Therefore, this study was conducted to see the general relationship without looking at the effect of causality more deeply. It also can be a recommendation for developing a better following study.

4 Conclusion

This study is a structural model of women who have had an abortion based on the IBM theory. As a result of a good fit of model tests established in this study based on RMSEA value, CFI, and SRMR, the hypothetical model was confirmed as the final model. It can be concluded that intention is the factor that directly and most significantly affects abortion. The experience of physical and sexual violence, the attitude toward the impact of ending pregnancy, and the lack of contraception knowledge have a direct effect on increasing the intention to have an abortion. The intention of abortion is caused by unwanted pregnancy. The use of effective modern contraception is only 25%. Hence, reducing contraceptive failure rates and increasing the use of LARC will reduce unwanted pregnancies and abortion incidence. Intimate partner violence (IPV) can increase the likelihood of an unwanted pregnancy, resulting in women having low autonomy over themselves. Therefore, communication programs, increasing awareness of the dangers and impacts, community participation, and social media need to be encouraged as efforts to prevent and overcome the problem of IPV.

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Conflicts of Interest

The authors declared no potential conflicts of interest with respect to research,

authorship, and/or publication of this article.

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