

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

Khoirun Nisa¹, Catur Suratnoaji², Agus Widiyarta³

^{1,2,3}Master of Communication, Faculty of Social, Cultural, and Political Sciences, Universitas Pembangunan Nasional “Veteran” Jawa Timur

ABSTRACT: The vasectomy program is a permanent contraceptive method for men that is safe, simple, and highly effective. However, it currently faces the challenge of low adoption in Indonesia. Health education is one of the key interventions to increase understanding and encourage acceptance of vasectomy use. This study aims to explain how education influences adoption rates and the characteristics of respondents in mediating the influence of education on adoption rates. The population in this study were married men of childbearing age in Sumberrejo Village. The sample was taken using the purposive sampling with certain criteria. Data were collected through a structured questionnaire and analyzed using statistical testing through Structural Equation Modeling - Partial Least Squares (SEM-PLS). The results of the study showed that extension had a positive (0.362) and significant (P-Values 0.000) on the adoption rate, extension has a positive (0.718) and significant (P-Values 0.000) on respondent characteristics, respondent characteristics have a positive (0.504) and significant (P-Values 0.000) on the adoption rate, extension has a positive (0.362) and significant (P-Values 0.000) effect on the adoption rate through respondent characteristics. Recommendations for improvement to minimize existing problems include the government and relevant institutions strengthening more targeted and comprehensive outreach programs to increase vasectomy adoption in the community.

KEYWORDS: Counseling, Vasectomy, Adoption Rate, SEM-PLS, Respondent Characteristics

I. INTRODUCTION

Communication plays a crucial role in successful development, acting as a bridge of information between the government and the community. This process ensures the reciprocal exchange of messages from the planning stage to the evaluation stage, with the aim of achieving development goals that are in line with the needs of the community (Nasution, 2010). The importance of communication in this context also involves the dissemination of development ideas and skills, which are essential for promoting positive behavioural change on a large scale through communication elements such as communicators, messages, channels, communicants, and effects (Koswara et al., 2019).

Indonesia, with its geographical, cultural, and population diversity, faces significant challenges in implementing development programmes. The population is projected to increase substantially by more than 8.5 million people between 2020 and 2023 and by more than 3 million people in 2024 (BKKBN, 2024). Although the growth rate is slowing, the large absolute increase each year has the potential to strain the availability of basic facilities and services. In response to this demographic situation, the government has implemented the Family Planning (KB) programme in accordance with Government Regulation No. 87 of 2014, which aims to achieve quality families through birth control.

In the KB programme, the use of contraceptives is central. However, the dominance of contraceptives among women has led to low male participation. To achieve sustainable population development and reproductive health, innovation diffusion is needed to drive behavioural change, from mere knowledge to actual adoption (Adawiyah, 2018). In line with the mandate of Law No. 52 of 2009 and international recommendations, Indonesia is now focusing on increasing male participation in KB, in the interest of gender justice and equality.

Among the available male contraceptive options, vasectomy is a choice in the innovation process due to its effectiveness, safety, simplicity, and permanent nature (Jacobstein et al., 2023; Shih et al., 2014). Vasectomy also represents men's responsibility in family planning and alleviates the burden of female contraception (Schwingl & Guess, 2000). However, the adoption of vasectomy remains low, particularly in East Java, including Surabaya. This low interest is influenced by myths, misconceptions, cultural beliefs, and lack of knowledge (Shongwe et al., 2019). Common misconceptions, such as vasectomy causing impotence or being equated with castration, along with inaccurate information, often trigger fear and rejection (Hardee et al., 2017; Nair et al., 2017). Given the limitations of the community in accepting innovations, support from family planning programme counsellors,

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

community leaders, religious leaders, and experienced vasectomy recipients is crucial. Effective Communication, Information, and Education (KIE) outreach, using a dialogic and interactive approach, is needed to address misconceptions and encourage adoption (Ajaero et al., 2016; BKKBN, 2015). Communication between partners also plays an important role in decision-making (Shattuck et al., 2014; Withers et al., 2015).

The speed of vasectomy adoption is influenced by information dissemination activities and the quality of communication by educators (Harinta, 2010). Berlo's SMCR (Source, Message, Channel, Receiver) communication model (1960) provides a systematic framework for designing effective education, emphasising the importance of credible communicators, relevant messages, widespread channels, and understanding the characteristics of the message recipients. Unlike previous studies that demonstrated the effectiveness of interpersonal communication but did not examine the role of local communicators and diffusion elements, this study will fill this gap by comprehensively examining diffusion elements, referencing principles from Rogers' Innovation Diffusion Theory, particularly how extension activities influence the stages of the individual innovation decision-making process in adopting vasectomy. Based on the above, the researcher is interested in investigating the extent to which counselling influences the adoption rate of the vasectomy programme among the community in Sumberrejo Village, Pakal District, Surabaya City.

II. METHOD

Research Approach and Sampling Method

This study is a quantitative study with a positivistic paradigm. The study was conducted in October 2024, beginning with preliminary observations in Sumberrejo Village, Pakal District, Surabaya City. Subsequently, the research framework and research proposal were developed. The sampling of respondents was conducted using purposive sampling, considering specific criteria such as household heads who had actively participated in the extension programme, respondents willing to provide information openly or without coercion, and respondents residing in the Sumberrejo Village area. Data collection was conducted over two months, in May and June 2025, with the target respondents being the community in the Sumberrejo Village area. The questionnaire was distributed directly to the respondents.

Data Analysis Method

The data analysis techniques used in this study were descriptive and confirmatory statistical analysis through Partial Least Squares (PLS) with Structural Equation Modelling (SEM). SEM is a multivariate analysis technique that tests the relationships between variables in a model and analyses the relationships between observed variables and constructs comprehensively (Hair Jr. et al., 2017). Evaluation in SEM-PLS includes evaluation of the measurement model (outer model) conducted at the first order and second-order levels to ensure the validity and reliability of indicators, including indicator reliability, convergent validity, and discriminant validity. Next, evaluation of the structural model (inner model) is conducted, including examination of the significance of path coefficients, evaluation of model goodness and fit by testing R-Square.

The questionnaire instrument was measured using a Likert scale with four response options: 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree). The Structural Equation Modelling (SEM) developed in this study was then formulated into four specific hypotheses. These hypotheses aim to test the influence between variables that have been identified in the conceptual framework of the model.

H1: Extension has a significant effect on the level of innovation adoption. H2: Extension has a significant effect on respondent characteristics.

H3: Respondent characteristics have a significant effect on the level of innovation adoption.

H4: Extension has a significant effect on the level of adoption through respondent characteristics.

Table 1. PLS-SEM Analysis Techniques

Evaluation Model		Analysis Unit		Requirements	
Measurement (outer model)	Model	Indicator	reliability factor	loading	> 0,70
		Composite reliability			> 0,70
		Cronbach's alpha			> 0,70
		Convergent Validity			> 0,50
		Average	Variance (AVE)	Extracted	
		Discriminant Validity Fornell-Larcker criterion		AVE of the laten constructs should be higher than any other latent construct	
Structural Model (inner model)	(inner model)	T-Statistics		> 1,96	
		P-Value		> 0,05	
		R-Square		The R-Square value ranges from 0 to 1, 0.75 (strong), 0.50 (moderate) and 0.25	

			(weak)
		Standardized Root Mean Square Residual (SRMR)	SRMR Value 0.08 – 0.10 model is acceptable

III. LITERATURE REVIEW

Theory of Innovation Diffusion

The theory of innovation diffusion was introduced by Everett M. Rogers in 1962 through his book entitled 'Diffusion of Innovation'. The theory of innovation adoption in extension is often defined as a mental process within a person or individual, from the moment a person accepts new ideas to the moment they decide to accept or reject those ideas. Innovation adoption is a process of behavioural change, whether in the form of knowledge (cognitive), attitude (affective), or skills (psychomotor), in an individual from the time they become aware of an innovation until they decide to adopt it after receiving the innovation (Rogers, 1995).

In the extension process, one of the objectives is to bring about behavioural change. However, the gradual process of innovation adoption often varies from one individual to another. The speed of innovation adoption depends on the behavioural change process that is being pursued. According to Rogers, there are factors that can influence the speed of innovation adoption, namely age, number of family members, education, and system norms (Rogers, 1995).

Rogers introduced a new formula in the innovation adoption process. The adoption theory is formulated into four stages, namely: 1) The knowledge stage, which is a state where individuals are not yet aware of information about the innovation and learn about the existence of an innovation; 2) The persuasion stage, which is a stage where individuals form positive or negative attitudes towards the innovation. This attitude directly influences whether an individual accepts or rejects an innovation; 3) Decision stage, where an individual engages in activities leading to the choice to accept or reject the innovation; 4) Confirmation stage, where individuals seek confirmation of the innovation decision they have made. If the information obtained contradicts their decision, they may change it.

Family Planning Programme Education

Health communication is the study of how to disseminate health information that can influence individuals and communities so that they can make appropriate decisions regarding health management (Liliweri, 2009). A common method of persuasion used in health communication is education.

Health education is also defined as a non-formal educational effort aimed at encouraging people to become aware of and willing to implement new ideas (Kaddi, 2014). Health education is intended as an effort to improve health, conducted to change the behaviour of individuals or community groups to live healthily through communication, information, and education (Rosidin et al., 2020). In this case, health education is conducted in family planning (FP) programmes. FP programme health education plays an important role in promoting reproductive health, as it empowers individuals to make appropriate choices regarding the number and timing of births in family planning. The success of education is determined by several interrelated or supporting factors, including:

1. Educators or communicators, They are the communicators who determine the increase in the use of family planning contraceptives. An educator acts as the spearhead of a programme and must have communication skills and credibility. Credibility is an important quality that must be possessed by someone who delivers education, information, and counselling, as the goal is to persuade the community. In fact, the credibility of the communicator is considered to have a significant influence on attitude change in the community (Rahmawati & R, 2023).
2. Extension Media, These are visual aids or tools that can be seen to explain what is meant, so that extension can be observed, heard, touched, or felt by the beneficiaries in understanding the extension material conveyed by the extension worker (Mardikanto, 2009). The determination of this media is about how to choose the right way to convey information so that it can be clearly understood by the public. The media used typically include print media (posters, leaflets, and brochures), audiovisual media, banners, and others.
3. Extension Methods, These are systematic approaches provided to individuals to acquire more knowledge through various methods tailored to their ability to comprehend the messages received. The more appropriate the extension method applied by the extension worker, the easier it is for the community to adopt the innovations provided through extension. There are several extension methods that can be used, such as (a) the home visit extension method, which is considered effective because it provides more comprehensive information, (b) the group extension method, which is considered easier for extension workers because it is more effective and efficient in terms of time, and (c) the mass extension method, which is quite good at reaching a larger target audience (Pello & Djunina, 2024).

Vasectomy Programme

Vasectomy is a long-term male sterilisation method that is widely accepted in developed and developing countries because of its advantages, which include simplicity, safety, effectiveness, and affordability (Barone et al., 2006). Additionally, vasectomy is

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

defined as a safe, simple, and highly effective permanent procedure that involves stopping the flow of sperm into semen by cutting or blocking the sperm ducts (vas deferens) through a small incision in the scrotum (Shih et al., 2014). Vasectomy is a permanent, safe, cost-effective, and 99.9% effective method of contraception in preventing pregnancy (Patel & Nguyen, 2020; Shih et al., 2011). Vasectomy is not the same as castration, as vasectomy only blocks the passage of sperm, while castration destroys both the man's testicles or the woman's ovaries. Additionally, the vasectomy method still allows for reversal or reconnection, but success depends on the man's age and the time since sterilisation (Johnson & Sandlow, 2017).

In light of this, prospective recipients must meet certain criteria before deciding to undergo vasectomy, including: (1) voluntary consent with no coercion, (2) being satisfied with having two living children, with the youngest child being over two years old, and both children being in good physical and mental health, obtaining the wife's consent, and the wife being over 25 years old, (3) being in good physical health, as confirmed by a pre-operative examination by a doctor. Prospective recipients must also sign an informed consent form before the vasectomy procedure to avoid any regrets regarding the use of this method (Velez et al., 2021).

IV. FINDINGS

A. Respondent Profile

Research data that met the respondent criteria was successfully collected for analysis from 97 respondents residing in Sumberrejo Village. The current demographic data for Sumberrejo Village shows a population of 13,245. The population is divided into 6,729 males and 6,516 females. Administratively, Sumberrejo Village consists of 8 RWs and 35 RTs. This division indicates an organised governmental structure down to the smallest community level. The geographical conditions of Sumberrejo Village are characterised by vast stretches of land, including salt pans, so that most of the population of Sumberrejo Village work as salt farmers and fish pond processors.

Table 2. Respondent Demographic Profile

Age	Frequency (F)	Percentage
35-40 years	6	19
41-45 years	29	29.90
46-50 years	26	26.80
51-55 years	36	37.11
Total	97	100.00
Education	Frequency	Percentage (%)
Primary School	5	5.15
Junior High School	30	30.93
Senior High School	34	35.05
Bachelor's Degree	28	28.87
Total	97	100,00

Respondents who showed indications of accepting the adoption process were mostly in the 51-55 age group (37.11%). Meanwhile, 6.19% were in the 35-40 age group, 29.90% were in the 41-45 age group, and 26.80% were in the 46-50 age group. Respondents' education levels also contributed to the increase in vasectomy adoption. Data in Table 2 shows that the majority of respondents were in the high school education category (35.05%). The other respondents were at the elementary school level (5.15%), junior high school level (30.93%), and D1-S1 level (28.87%).

The distribution of respondents' perceptions regarding the credibility dimension of counsellors is described in Table 3, while respondents' answers regarding the counselling media dimension are described in Table 4, and respondents' answers regarding the counselling method dimension are described in Table 3.

Table. 3 Respondents Responses Regarding the Credibility of Extension Workers

Interval	Credibility of Extension Workers	Frequency (F)	Percentage (%)
4 – 9	Good	76	78,35
10 – 15	Fairly Good	16	16,49
16 – 20	Not Good	5	5,15
Total		97	100,00

Table 3 indicates that the credibility of extension workers is influential in supporting the implementation of extension services. This result is shown by the responses of respondents in the good category (78.35%), which means that the educational messages conveyed by extension workers are accepted, trusted, and followed by respondents.

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

Table 4. Respondents Responses Regarding Extension Media

Interval	Media of Information	Frequency (F)	Percentage (%)
4 – 9	Good	35	36,08
10 – 15	Fairly Good	55	56,70
16 – 20	Not Good	7	7,22
Total		97	100,00

Table 4 indicates that information disseminated through the media has an effect on acceptance in terms of adoption. This result is demonstrated by the responses of respondents in the fairly good category (56.70%), which means that the flow of information through the media is still limited and not diverse, so respondents do not have a choice in accessing varied information about vasectomy.

Table 5. Respondents Responses Regarding Education Methods

Interval	Media of Information	Frequency (F)	Percentage (%)
4 – 9	Good	58	59,79
10 – 15	Fairly Good	32	32,99
16 – 20	Not Good	7	7,22
Total		97	100,00

Table 5 indicates that the counselling methods used by family planning counsellors were successful in promoting acceptance of vasectomy adoption. This result is demonstrated by the responses of respondents in the good category (59.79%), which means that the methods used through home visits, group discussions and lectures were well accepted by respondents.

Unlike the dimensions of counsellor credibility, counselling media, and counselling methods, Figure 6 below explains the suitability of acceptance of adoption in the social norms variable. Based on Figure 6, it is evident that social norms play an important role in adoption decision-making. This is because the social environment actively supports innovation, considering that innovation also develops within a social system.

Table 6. Respondents Responses Regarding Social Norms

Interval	Social Norm	Frequency (F)	Percentage (%)
4 – 9	Appropriate	39	40,21
10 – 15	Less Appropriate	51	52,58
16 – 20	Inappropriate	7	7,22
Total		97	100,00

Table 6 indicates that social norms, which serve as guidelines in regulating social life, do not fully accept vasectomy as a family planning method. This is shown by most respondents giving responses in the 'less appropriate' category (52.58%).

Furthermore, Table 7 below explains the adoption rate variable. The adoption rate variable shows the percentage of respondents who accept and reject vasectomy as an innovation.

Table. 7 Respondent Responses Regarding Adoption Rate

Interval	Adoption Rate	Frequency (F)	Percentage (P)
20-50	Reject	15	15,46
51-81	Accept	82	84,54
Total		97	100,00

Table 7 indicates that all respondents were open to accepting the innovation provided. This result is shown by the responses of respondents in the accepting category (84.54%).

To identify the comprehensive influence of extension on the adoption rate from the dimensions presented, a cross tabulation is presented in Table 8.

Table 8. Crosstab Results for the Variable of the Influence of Extension in the Level of Adoption Counseling * Adopsi Crosstabulation

			Adoption		Total
			Accept	Reject	
Counseling	Good	Count	64	7	71
		% within Penyuluhan	90.1%	9.9%	100.0%
		% within Adopsi	78.0%	46.7%	73.2%
		% of Total	66.0%	7.2%	73.2%
	Fairly Good	Count	16	7	23
		% within Penyuluhan	69.6%	30.4%	100.0%
		% within Adopsi	19.5%	46.7%	23.7%
		% of Total	16.5%	7.2%	23.7%
	Not Good	Count	2	1	3
		% within Penyuluhan	66.7%	33.3%	100.0%
		% within Adopsi	2.4%	6.7%	3.1%
		% of Total	2.1%	1.0%	3.1%
Total		Count	82	15	97
		% within Penyuluhan	84.5%	15.5%	100.0%
		% within Adopsi	100.0%	100.0%	100.0%
		% of Total	84.5%	15.5%	100.0%

The cross-tabulation results show a positive relationship between the quality of extension services and the level of adoption. The majority of respondents who rated the extension services as good showed a very high level of adoption (90.1%). The level of adoption decreased as the quality of extension services declined. Extension quality is the main driver of adoption (78.0% of recipients came from good extension services). However, rejection of adoption is more evenly distributed (46.7% good, 46.7% fair), indicating that other factors influence rejection.

Measurement Model (Outer Model)

The evaluation of the measurement model consists of reliability and validity tests. The reliability of the measurement model refers to the reliability value of the indicators (loading factor) and internal consistency reliability (composite reliability and Cronbach's alpha) with values above 0.70 (Hair Jr. et al., 2017). The evaluation of the measurement model in Table 9 for the latent variable constructs has met the indicator reliability requirements, as the loading factor for each indicator is greater than 0.7.

Table 9. Outer Loading Values

Indikator	Outer loadings
X1.1 <- Credibility (X1)	0.886
X1.2 <- Credibility (X1)	0.910
X1.3 <- Credibility (X1)	0.895
X1.4 <- Credibility (X1)	0.898
X1.5 <- Credibility (X1)	0.764
X2.1 <- Media (X2)	0.730
X2.2 <- Media (X2)	0.926
X2.3 <- Media (X2)	0.920
X2.4 <- Media (X2)	0.827
X2.5 <- Media (X2)	0.762
X3.1 <- Method(X3)	0.772
X3.2 <- Method(X3)	0.828
X3.3 <- Method(X3)	0.823
X3.4 <- Method(X3)	0.814
X3.5 <- Method(X3)	0.797
Z1.1 <- Personal Characteristics(Z1)	0.905
Z1.2 <- Personal Characteristics(Z1)	0.917

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

Z2.1 <- Social Norms(Z2)	0.771
Z2.2 <- Social Norms(Z2)	0.763
Z2.3 <- Social Norms(Z2)	0.823
Z2.4 <- Social Norms(Z2)	0.706
Z2.5 <- Social Norms(Z2)	0.781

Next, we measure discriminant validity using the Fornell-Larcker criterion. Discriminant validity is considered high and acceptable if the square root of AVE for each construct is greater than the correlation value between that construct and other constructs. Table 10 shows that the constructs have a high level of discriminant validity, which is presented in italics or diagonally.

Table 10. Result of Discriminant Validity Fornell-Larcker Criterion

Indicator	Personal Characteristics(Z1)	Credibility (X1)	Media (X2)	Method(X3)	Social Norms (Z2)
Personal Characteristics(Z1)	0.911				
Credibility (X1)	0.460	0.872			
Media (X2)	0.631	0.797	0.837		
Method(X3)	0.666	0.870	0.892	0.807	
Social Norms(Z2)	0.680	0.543	0.718	0.670	0.770

AVE Construct Roots Construct Correlation

The next step is to measure the reliability of internal consistency based on composite reliability and Cronbach's alpha values. The measurement results in Table 11 show that the composite reliability and Cronbach's alpha values exceed the limit of 0.7 and the AVE exceeds the accepted value of 0.5.

Table 11. Internal Consistency Reliability Results

Indikator	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability	Average variance extracted (AVE)
Personal Characteristics(Z1)	0.796	0.798	0.907	0.830
Respondent Characteristic (Z)	0.871	0.875	0.900	0.564
Credibility (X1)	0.920	0.920	0.941	0.761
Media (X2)	0.890	0.903	0.921	0.700
Method(X3)	0.866	0.869	0.903	0.651
Social Norms(Z2)	0.827	0.831	0.879	0.593
Counselling (X)	0.958	0.959	0.962	0.631
Adoption Rate(Y)	0.970	0.972	0.973	0.643

Structural Model (Inner Model)

The next stage after measuring validity and reliability is evaluating the structural model using path coefficient significance to test hypotheses directly and indirectly.

Table 12. Testing Direct Influence Hypotheses

Variable relations	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
Characteristic (Z) -> Adoption Rate(Y)	0.504	0.505	0.090	5.618	0.000
Counselling(X) -> Characteristic (Z)	0.718	0.722	0.046	15.547	0.000
Counselling(X) -> Adoption Rate(Y)	0.362	0.366	0.092	3.940	0.000

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

The measurement results indicate that the extension programme has a positive and significant effect on the adoption rate, with a path coefficient of 0.362, a t-statistic value of $3.940 > 1.96$, and a p-value of $0.000 < 0.05$. Meanwhile, in other results, extension also has a positive and significant effect on respondent characteristics with a path coefficient (0.718) with a t-statistic value ($15.547 > 1.96$) and a p-value of $0.000 < 0.05$. In the final measurement, respondent characteristics had a positive and significant effect on adoption levels, with a path coefficient of 0.504, a t-statistic value of $5.618 > 1.96$, and a p-value of $0.000 < 0.05$.

Next, a hypothesis test was conducted on the indirect effect to see the mediating effect that occurs when the mediating variable acts as a mediator between the independent and dependent variables.

Table 13. Hypothesis Testing of Indirect Effect

Variable relations	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Counselling(X) -> Characteristic (Z) -> Adoption Rate(Y)	0.362	0.364	0.070	5.163	0.000

The measurement results show that extension has a positive and significant effect on the adoption rate through respondent characteristics with a path coefficient (0.362) with a t-statistic value ($5.163 > 1.96$) and a p-value of $0.000 < 0.05$.

Table 14. R-Square Value

Variabel	R-square	R-square adjusted
Characteristic (Z)	0.515	0.509
Adoption Rate(Y)	0.647	0.638

The R-Square value measurement for Characteristics (Z) of 0.515 indicates that the model has moderate predictive power. Meanwhile, the R-Square value for Adoption Level (Y) of 0.647 indicates moderate to strong predictive power of the model.

Table 15. Standardised Root Mean Square Residual (SRMR) Values

	Saturated model	Estimated model
SRMR	0.090	0.090

The SRMR value of 0.090 indicates that the research model has acceptable fit, indicating that the empirical data adequately explains the influence between variables in the model.

The results of the data analysis confirmed all hypotheses, showing that the influence between variables was positive and significant. Directly, extension services have been proven to be a driver of increased innovation adoption, as the process involves increasing knowledge, forming persuasion, and making decisions that lead to sustainable adoption. In addition, extension services also indirectly shape the characteristics of respondents to be more adaptive, where adequate education can reduce stigma and increase acceptance, reflecting changes in characteristics and significant relationships with socio-cultural factors. These findings are consistent with Rogers' (1995) theory of innovation diffusion, which states that the adoption process is influenced by individual characteristics and the effectiveness of extension workers in tailoring messages to target characteristics. If all components of extension, the formation of respondent characteristics, and effective communication work synergistically, the process of innovation adoption can be more quickly accepted and implemented by the community.

V. CONCLUSION

1. Education was found to have a positive and significant effect on the adoption rate of vasectomy programmes ($p < 0.05$).
2. Education also had a positive and significant effect on respondent characteristics ($p < 0.05$).
3. Respondent characteristics were found to have a positive and significant effect on the adoption rate ($p < 0.05$).
4. Education has a positive and significant effect on adoption rates through respondent characteristics ($p < 0.05$), indicating that respondent characteristics mediate part of the effect of education on adoption rates.

VI. RECOMMENDATIONS

Based on the findings of this study, several recommendations can be proposed for future research, policy development, and practical implementation:

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

1. Measurement of stronger mediating variables, such as knowledge or other factors that deeply influence counselling.
2. Conducting research involving married couples to understand their support for the decision to adopt vasectomy.
3. Family planning counsellors should prioritise efforts to improve respondent characteristics (age, education and social norms) given their significant role as a bridge and mediator between counselling and adoption rates.

REFERENCES

- 1) Adawiyah, C. R. (2018). Urgensi Komunikasi dalam Kelompok Kecil untuk Mempercepat Proses Adopsi Teknologi Pertanian. *Forum Penelitian Agro Ekonomi*, 35(1). <https://doi.org/10.21082/fae.v35n1.2017.59-74>
- 2) Ajaero, C. K., Odimegwu, C., Ajaero, I. D., & Nwachukwu, C. A. (2016). Access to mass media messages, and use of family planning in Nigeria: A spatio-demographic analysis from the 2013 DHS. *BMC Public Health*, 16(1). <https://doi.org/10.1186/s12889-016-2979-z>
- 3) Barone, M. A., Hutchinson, P. L., Johnson, C. H., Hsia, J., & Wheeler, J. (2006). Vasectomy in the United States, 2002. *Journal of Urology*, 176(1). [https://doi.org/10.1016/S0022-5347\(06\)00507-6](https://doi.org/10.1016/S0022-5347(06)00507-6)
- 4) BKKBN. (2015). Modul Diklat Teknis Penggunaan Alat Bantu Pengambilan Keputusan (ABPK) dalam KIP/Konseling KB. Badan Kependudukan dan Keluarga Berencana Nasional.
- 5) BKKBN. (2024). Laporan Kependudukan Indonesia 2024. Badan Kependudukan dan Keluarga Berencana Nasional.
- 6) Hair Jr., J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2). <https://doi.org/10.1504/ijmda.2017.10008574>
- 7) Hardee, K., Croce-Galis, M., & Gay, J. (2017). Are men well served by family planning programs? In *Reproductive Health* (Vol. 14, Issue 1). <https://doi.org/10.1186/s12978-017-0278-5>
- 8) Harinta. (2010). Hubungan Sosial Ekonomi Petani dan Kualifikasi Penyuluh Terhadap Adopsi Teknologi Pengelolaan Tanaman dan Sumber daya Terpadu Budi daya Padi (*Oryza sativa*). *Widyatama*, 19(2).
- 9) Jacobstein, R., Radloff, S., Khan, F., Mimno, K., Pal, M., Snell, J., Stafford, R., Touré, C., & Tripathi, V. (2023). Down But Not Out: Vasectomy Is Faring Poorly Almost Everywhere-We Can Do Better To Make It A True Method Option. *Global Health Science and Practice*, 11(1), 1–24. <https://doi.org/10.9745/GHSP-D-22-00369>
- 10) Johnson, D., & Sandlow, J. I. (2017). Vasectomy: Tips and tricks. In *Translational Andrology and Urology* (Vol. 6, Issue 4). <https://doi.org/10.21037/tau.2017.07.08>
- 11) Kaddi, S. M. (2014). Strategi Counselling Kesehatan Masyarakat dalam Menanggulangi Bahaya Narkoba di Kabuoaten Bone. *Jurnal Academica*, 06(01).
- 12) Koswara, I., Erlandia, D. R., & Truline, P. (2019). The strategy of marketing communication in tourism industry through one village one product approach in west java province. *International Journal of Psychosocial Rehabilitation*, 23(2).
- 13) Liliweri, A. (2009). *Dasar-Dasar Komunikasi Kesehatan*. Pustaka Pelajar.
- 14) Mardikanto, T. (2009). *Sistem Penyuluhan Pertanian*. UNS Press.
- 15) Nair, G. R., Wadke, R., Relwani, N., Mahadik, V., & Anjenaya, S. (2017). Knowledge and attitude of married men towards vasectomy in an urban slum of Navi Mumbai. *International Journal Of Community Medicine And Public Health*, 4(12).
- 16) Nasution, Z. (2010). *Komunikasi Pembangunan Pengenalan Teori dan Penerapannya*. PT. Raja Grafindo Pensada.
- 17) Patel, J., & Nguyen, B. T. (2020). Vasectomy: An Opportunity for Obstetricians and Gynecologists. *Clinical Obstetrics and Gynecology*, 63(2).
- 18) Pello, W. Y., & Djunina, H. (2024). Pengaruh Metode dan Media Penyuluhan Pertanian terhadap Adopsi Budidaya Padi Sawah. *Penyuluhan*, 20(02), 272–283.
- 19) Rahmawati, D. P., & R, M. A. A. (2023). Pengaruh Credibility Komunikator dalam Edukasi Preventif Stunting terhadap Perubahan Sikap Masyarakat di Wilayah UPT Puskesmas Padasuka. *E-Proceeding of Management* : Vol.10, No.6.
- 20) Rogers, E. M. (1995). *Diffusion of Innovations*. 4th Edition. the Free Press.
- 21) Rosidin, U., Rahayuwati, L., & Herawati, E. (2020). Perilaku dan Peran Tokoh Masyarakat dalam Pencegahan dan Penanggulangan Pandemi Covid -19 di Desa Jayaraga, Kabupaten Garut. *Umbara*, 5(1). <https://doi.org/10.24198/umbara.v5i1.28187>
- 22) Schwingl, P. J., & Guess, H. A. (2000). Safety and effectiveness of vasectomy. *Fertility and Sterility*, 73(5).
- 23) Shattuck, D., Wesson, J., Nsengiyumva, T., Kagabo, L., Bristow, H., Zan, T., & Ngabo, F. (2014). Who chooses vasectomy in Rwanda? Survey data from couples who chose vasectomy, 2010-2012. *Contraception*, 89(6). <https://doi.org/10.1016/j.contraception.2014.02.003>
- 24) Shih, G., Turok, D. K., & Parker, W. J. (2011). Vasectomy: The other (better) form of sterilization. In *Contraception* (Vol. 83, Issue 4). <https://doi.org/10.1016/j.contraception.2010.08.019>

Vasectomy Counselling and Adoption in Urban Areas: An Empirical Study in Surabaya, Indonesia

- 25) Shih, G., Zhang, Y., Bukowski, K., & Chen, A. (2014). Bringing men to the table: Sterilization can be for him or for her. *Clinical Obstetrics and Gynecology*, 57(4). <https://doi.org/10.1097/GRF.0000000000000060>
- 26) Shongwe, P., Ntuli, B., & Madiba, S. (2019). Assessing the acceptability of vasectomy as a family planning option: A qualitative study with men in the Kingdom of Eswatini. *International Journal of Environmental Research and Public Health*, 16(24). <https://doi.org/10.3390/ijerph16245158>
- 27) Velez, D., Pagani, R., Mima, M., & Ohlander, S. (2021). Vasectomy: a guidelines-based approach to male surgical contraception. In *Fertility and Sterility* (Vol. 115, Issue 6). <https://doi.org/10.1016/j.fertnstert.2021.03.045>
- 28) Withers, M., Dworkin, S. L., Zakaras, J. M., Onono, M., Oyier, B., Cohen, C. R., Bukusi, E. A., Grossman, D., & Newmann, S. J. (2015). 'Women now wear trousers': men's perceptions of family planning in the context of changing gender relations in western Kenya. *Culture, Health and Sexuality*, 17(9). <https://doi.org/10.1080/13691058.2015.1043144>



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.