

Improving Communication Messages by Using Perceptual Mapping: Family Planning Survey in East Java and West Nusa Tenggara, Indonesia

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Abstract

Objectives: Contraceptive methods vary in effectiveness, actions required of users, and side effects. This article aims to analyze the perceptions about contraceptive methods among family planning clients of the East Java and West Nusa Tenggara (NTB) provinces in Indonesia.

Methods: The data were obtained from the operational research of the Improving Contraceptive Method Mix Project in Indonesia, conducted in 2015–2016 in six districts in East Java and West Nusa Tenggara. The total sample size was 12,190 women aged 15–49 years. The perceptual mapping method uses cross-sectional surveys that require the respondent to rate the level to which they associate specific elements with each other, based on similarities and differences of perceived association. The correlation matrices for six contraceptive methods and five attributes were subjected to a multidimensional scaling analysis.

Results: The results showed injectable to be the most preferred method, which was positioned closest to the attributes ‘easy to use’ and ‘easy to get’, followed by pills. Implants ranked higher than other long-acting and permanent method.

Conclusion: Injectables and pills were the most preferred because people believe that they were ‘easy to use’ and ‘easy to get’. The least preferred methods were tubectomy and vasectomy because the respondents thought those were not close to any attributes at all. To increase the demand for the long-acting and permanent method choice in the provinces of East Java and West Nusa Tenggara, the attributes ‘easy to use’ and ‘easy to get’ should be emphasized in the long-acting and permanent method Information Education and Communication messages.

Keywords

Women’s health, family planning, perceptual mapping, health communication, contraceptive method mix, long-acting and permanent methods

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Introduction

Family planning (FP) is one of the most cost-effective and valuable investments in health.¹ As such, providing FP to women who do not wish to become pregnant will diminish the number of unwanted pregnancies.^{2–5} Indonesia was once recognized for its significant achievements in FP programmes but has recently shown a decline. The total fertility rate (TFR) at the national level remained at 2.6 children per fertile woman for 10 years from 2002 to 2012 even though it then decreased slowly to 2.4 by 2017. However, 6 years earlier, it had dropped rapidly from 3.02 to 2.78.⁶

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In light of the above, modern methods are effective in preventing conception.⁷ Therefore, if clients do not want to get pregnant, they need information on the efficacy of various methods and that long-acting and permanent methods (LAPMs) provide the most effective prevention against pregnancy for those who are sexually active. Furthermore, clients should be counselled that the effectiveness of short-acting methods depends on adherence and correct use and that if these methods are not used consistently that could lead to afflicted by issues with adherence, leading to imperfect or inconsistent use and subsequent unintended pregnancy.⁸ Despite the availability of a variety of contraceptive methods, millions of women still have an unmet need for contraceptive choices. Another study found the low level of LAPM use among currently FP clients and highlight social determinants that influence women to choose LAPM. LAPM use was positively associated with LAPM availability, encouragement to use LAPM, perceived distance, knowledge about LAPM, desire to have no more children, and contraceptive decisions jointly with husbands.⁹

The 2017 Indonesia Demographic and Health Survey (IDHS) described that presently married women used modern contraceptives, where less than 20% used LAPM. Moreover, FP clients in Indonesia prefer short-term methods, such as injectables and pills (injectable 29% and pill 125), while LAPM intrauterine device (IUD) and implant are only at 5%.⁶ The government has targeted increasing the use of LAPM because short-term family planning users show high dropout rates and risk of causing unwanted pregnancies (46% pill and 28% injection).¹⁰

One study of reproductive health services in Indonesia showed that FP clients tend to use injectables, pills, and implants for long-term prevention of pregnancy, prioritizing the following attributes: 'ease of use', 'no side effects', and 'no shame'. In addition, these clients perceived pills and injectables to have the aforementioned.¹¹ Another study in Uttar Pradesh, India, however, presented different results, showing the essential attributes of contraception to be that of 'comfort' and 'effectiveness', whereas pills and IUDs were viewed positively because they are 'easy to get', 'easy to use', 'socially acceptable', and 'effective'. However, none of the methods received an excellent grade in the category of 'no side effects'. Interestingly, in this study, it was evident that FP clients' perceptions of contraceptive attributes may change over time.¹²

In addition, contraceptive products are chosen by acceptors to meet their unique fertility needs. With a broad contraceptive method mix, FP clients have the opportunity to choose their preferred type. A client's perception of FP methods is an essential factor associated with their choice. Hence, when individualizing patient counselling, misperceptions must be identified and addressed with women of all educational backgrounds¹³ as perception – or image – is a subjective concept that affects behaviour. It can be more comprehensive than attitudes, beliefs, or values.^{14,15} Accordingly, a client's mental picture often defines their basic orientation towards products,

innovations, and institutions – among other things. This concept of perception is how one views something; we can use the positioning of products (in this case, contraceptive methods) to understand consumer perceptions about products and their attributes.¹⁶

A study in the same province found that mothers' perceptions of the side effects of contraceptive methods, the ease of contraceptive use, and the cost of the contraceptives were significantly associated with rational patterns of switching contraceptive methods. They considered non-LAPM rather than LAPM.¹⁷ Another study in the same area confirmed the significant association between low levels of knowledge and non-utilization of LAPM. The FP clients do not only know the difference of LAPM methods but also how LAPMs can be used for limiting not only spacing.¹⁸

This mapping can also be helpful to better communicate about contraceptive methods. Studies among adolescent FP clients in the United States have shown that myths and misconceptions about IUDs are common. However, according to Russo et al. (2013), after receiving information and counselling, there was an increase in the demand by adolescents for IUDs as well as their level of satisfaction with IUD use. Therefore, perceptual mapping can help us understand the general perceptions about FP and inform the demand of the generation and behaviour change activities. The purpose of this article is to analyze perceptions from FP potential clients to help develop communication regarding FP messages and inform behaviour change communication strategies.

Methods

Study setting

The data were obtained from the operational research of the Improving Contraceptive Method Mix (ICMM) Project in Indonesia, conducted in 2015–2016 in six districts: Bojonegoro, Blitar, and Jombang in East Java province in the western part of Indonesia with the second largest population of around 37,476,757. Bima, Central Lombok, and North Lombok in NTB Province in the eastern region, with a total population of approximately 4,500,212.¹⁹

Study design and samples

The perceptual mapping method uses cross-sectional surveys that require the respondent to rate the level to which they associate specific elements with each other, based on similarities and differences of perceived association. In accordance with this, contrasting other mental mapping procedures that need the subject to make complex overall judgments, this technique only requires subjects to judge the individual items and assemble those components as a perceptual mapping graph.

Using the value of significant level=0.05, power=80% and deff=2 for the three stages cluster sample design and the

Table 1. Characteristics of respondents.

Variables	Categories	Province	
		East Java	West Nusa Tenggara
Age (years)	≤20	170 (3.1%)	402 (6%)
	21–34	2401 (43.8%)	3453 (51.4%)
	≥35	2907 (53.1%)	2857 (42.6%)
Parity	1–2 children	4412 (80.5%)	4381 (65.3%)
	3–4 children	1042 (19%)	2155 (32.1%)
	≥5 children	24 (0.4%)	176 (2.6%)
Social economy	Low (quintile 1–2)	785 (14.3%)	3872 (57.7%)
	Middle (quintile 3)	882 (16.1%)	1616 (24.1%)
	High (quintile 4–5)	3811 (69.6%)	1224 (18.2%)
Education	Low	3677 (67.1%)	4733 (70.5%)
	Middle	1413 (25.8%)	1538 (22.9%)
	High	388 (7.1%)	441 (6.6%)
Awareness of contraceptive methods	Pills	4656 (85%)	4106 (61.2%)
	Injectable	5060 (92.4%)	6146 (91.6%)
	IUD	2922 (53.3%)	2621 (39%)
	Implant	2859 (52.2%)	3616 (53.9%)
	Tubectomy	876 (16%)	470 (7%)
	Vasectomy	218 (4%)	161 (2.4%)

proportion of LAPM usage in East Java Province = 16% and NTB = 11.4%. The minimum number of samples needed for East Java are 5648 women of childbearing age who have been married and 6672 women of childbearing age who have married in NTB. Moreover, to anticipate the loss to follow-up the sample, the number of samples in the two regions was rounded to 6000 respondents in East Java and 7500 respondents in NTB.

The sampling technique used a multi-stage cluster design: 50 villages were selected from each district using the probability proportionate to size method. From each village, one hamlet was selected randomly. From each hamlet in East Java and NTB, respectively, 40 and 50 subjects were randomly selected and interviewed using structured questionnaires. Of the total sample size of 13,282 respondents, this analysis used information from 12,190 women aged 15–49 years.

Instrument measurement of perception

The questionnaire has undergone validity testing through the content test stage, aiming to ensure whether the respondent understands these questions, both in the form of preferences and similarity scale. The reliability test of the questionnaire was carried out by measuring the value of internal consistency (Cronbach's). Each variable has a Cronbach's alpha value > 0.7, based on which the instrument was used for reliable perception mapping measurement.²⁰

This study consisted of 66 questions with a semantic differential scale. Four types of questions were used for measurement:

1. Perceived similarity among a set of objects (contraceptive methods);
2. Importance of each attribute to the evaluation of the objects;
3. Preference for each object;
4. Importance of each object related to its attributes.

Respondents were asked to rate on a scale of 0–100 according to the strength of preference.

Statistical methods

All statistical analyses were conducted using STATA version 14.1 (StataCorp. 2015, Stata Statistical Software StataCorp LP). First, descriptive statistics were calculated and then we performed a multidimensional scaling (MDS) analysis. MDS is related to making graphics (maps) to describe the position of an object with other objects, also associated with making a map describing the position of an object and its attributes. It offers a visual illustration of similarities or dissimilarities among objects.

The MDS analysis results in a statistical calculation of eigenvalues that determine the presence of significant groups according to respondents' perceptions of the various contraceptives and their attributes. Both East Java and NTB showed the same result and yielded two significant groups.

Results

Table 1 shows of the 12,190 married women, 53.1% from East Java were aged ≥ 35 years, compared with 51.4% in

Table 2. Eigenvalue multidimensional scaling.

EAST JAVA				<i>Mardia fit measure 1 = 0.3911</i>	
<i>Eigenvalue > 0 = 10</i>				<i>Mardia fit measure 2 = 0.6371</i>	
Dimensions obtained = 2				Number of observations = 12	
Dimension	Eigenvalues	abs (eigenvalue) %	Cumulative	(eigenvalues) ² %	Cumulative
1	1.39*	25.62	25.62	49.89	49.89
2	0.73*	13.48	39.11	13.81	63.71
NTB				<i>Mardia fit measure 1 = 0.3594</i>	
<i>eigenvalue > 0 = 10</i>				<i>Mardia fit measure 2 = 0.5696</i>	
Dimension obtained = 2				Number of observations = 12	
Dimension	Eigenvalues	abs (eigenvalue) %	Cumulative	(eigenvalues) ² %	Cumulative
1	1.38*	24.11	24.11	45.90	45.90
2	0.68*	11.83	35.94	11.06	56.96

*Significant.

Table 3. Configuration value of two dimensions.

Variables	NTB		East Java	
	Dimension 1	Dimension 2	Dimension 1	Dimension 2
Pill	0.0406	0.5146*	0.2558	0.3012*
Injection	0.2742*	-0.1601	0.2897*	0.0105
IUD	-0.2096	0.4198*	-0.1341	0.3388*
Implant	-0.1252	-0.0550	-0.1275	0.4289*
Tubectomy	-0.6195	-0.1914	-0.5859	-0.1434
Vasectomy	-0.6524	-0.0841	-0.6358	-0.1224
Easy to use	0.3201*	0.0520	0.3039*	-0.0000
Effective	0.1052	-0.1062	-0.0061*	-0.1008
Easy to get	0.2630*	0.1831	0.2707*	0.1500
No side effects	0.1423	-0.1216	0.0733	-0.2348
Long lasting	-0.0194	-0.2224	-0.2017	-0.2099
Respondent	0.4808*	-0.2287	0.4977*	-0.4181

Significant if configuration value $\lambda \geq 0, 2$.

NTB. In both provinces, fertility rates were similar: most family sizes were in the 'small' category (1–2 children) and most respondents had low levels of education. According to socioeconomic status, East Java respondents had mainly higher incomes (quintile 4–5); most respondents in West Nusa Tenggara were of low socioeconomic status.

Table 2 shows the MDS analysis, which produces statistical calculations of eigenvalues that determine the presence of significant groups according to respondents' perceptions of the diversity of contraceptives and their attributes. Both in East Java and NTB, two dimensions among 12 measurements of MDS were obtained. Furthermore, the explanation of the two significant dimensions in this multidimensional analysis is in Table 3.

Table 3 explains the dimensions of one in the two provinces showing the same result: respondents close to injection, 'easy to use', and 'easy to get'. Meanwhile, in Dimension 2, East Java shows pill, IUD, and implant close together, but with only pill and IUD in NTB.

Figures 1 and 2 show the distance between respondents to the contraceptive and its most critical attribute according to client perception. The explanation for Group 1 in East Java and NTB is that the most popular contraceptive was the injectable, with its attributes of 'easy to use' and 'easy to get'. There was a different result for Group 2: in East Java, the pill, IUD, and implant were close together, but in NTB, only the pill and IUD were close.

Accordingly, FP methods, attributes, and client preferences were combined into a single perceptual map representing the relative positions of all attributes and contraceptive methods. The relationships shown in the composite perceptual map differ somewhat from those obtained by analyzing the method preference or attribute importance alone because all of these elements are combined in the minds of the respondents.

Figures 1 and 2 contain all methods and attributes as well as the respondents' position on both methods and attributes. The closer any two concepts are in the diagram, the more

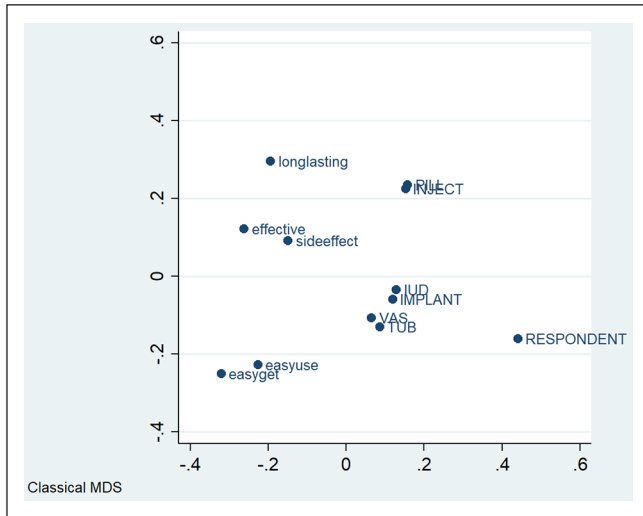


Figure 1. Two dimensions of perceptual mapping of family planning clients in East Java.

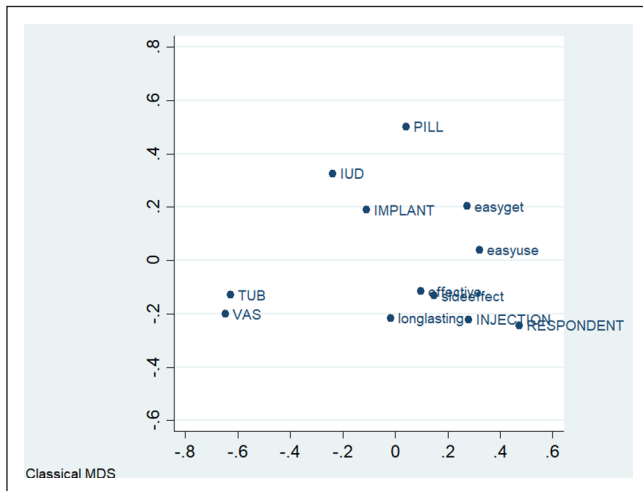


Figure 2. Two dimensions of perceptual mapping of family planning clients in West Nusa Tenggara.

strongly they are associated in the minds of the respondent. As such, when all aspects of FP methods are considered together, the method most preferred by them is the injectable, followed by the pill. Injectables and pills were the most preferred because people believe that they were ‘easy to use’ and ‘easy to get’. The least preferred methods were tubectomy and vasectomy because the respondents believed those were not close to any attributes at all.

Discussion

Although the majority of respondents have 1–2 children, if their choice of contraception is still short-term, pills, and injections, they need to understand that their chances of having an unwanted pregnancy remain high. The National

Family Planning Coordinating Agency targets an increase in the use of LAPM because it can reduce the risk of FP failure due to using short-term contraception.¹⁰

This study explored the perceived images held by potential FP clients to describe the positions of contraceptive methods and mutually relative attributes. The results of this study indicate that clients had the most positive image of the injectable and associated it with the attributes ‘easy to use’ and ‘easy to get’. This confirms the consumer behaviour study conducted by Handi Irawan, which examined 10 characteristics of the Indonesian consumer, one of which was classified as ‘short-term planning’ – a characteristic that lines up with the concepts of ‘easy to use’ and ‘easy to get’ –signifying that consumers in Indonesia value convenience when choosing a product.²¹ This can be valuable when developing communication messages about longer term methods.

The results of this study indicate that potential FP clients have the most positive images of injectables followed by pills. This result is consistent with the Indonesia Demographic and Health Survey (DHS).⁶ Furthermore, the results of the perceptual mapping of contraceptive methods were different compared with the previous studies,¹¹ which confirms that mapping results vary according to time and place.²²

This study confirmed research conducted among female students at the University of Maryland showing that myths and rumours about contraceptive methods persist even among those with good knowledge of contraception.²³ Despite the fact that LAPM, such as IUDs, is effective, reversible forms of contraception with high patient satisfaction and continuation,^{24,25} several studies prove that clients are still not well understood. Women with moderate levels of LAPM knowledge were less likely to use LAPM than women with high levels of knowledge. As a result, efforts to strengthen counselling services and increased provider knowledge and counselling skills are important to improve women’s knowledge and use of LAPM.^{18,26}

In addition to the above, knowledge and perceptions appeared to drive method selection of contraception. The most common reasons for choosing short-acting methods were ease of access, lower cost, privacy, perceived fewer side effects, and freedom to stop using a method without involving the health provider.²⁷

Some studies on the knowledge and use of contraception in African countries confirm the myths and misconceptions of acceptors about LAPM. A study in Uganda on misconceptions related to the IUD reported that with the use of IUDs (0.4%) and low susceptibility (0.4%), FP clients assumed that the use of IUDs could lead to permanent infertility.²⁸ A survey in Ghana found that women’s knowledge about the IUD was high, but their misconceptions about ‘side effects’ led to non-use of the same.²⁹

A qualitative study on the attitudes of women in Scotland towards contraception led to contradictory findings.³⁰ Although they understood the importance of using LAPM – IUDs and implants – pills and condoms were more familiar

and acceptable because of their limited side effects. This points to the importance of communicating clearly about LAPMs' effectiveness and side effects.

In light of the above, perceptual mapping uses MDS analysis to produce a graphic display of how participants perceive the relationships among the set of elements by modelling the similarities and dissimilarities as distances between points in a multidimensional space. Moreover, it provides a well-tested methodology for assessing perceptions regarding developing a message or intervention strategies and tracking conceptual changes over time.^{31,32}

Strengths and limitations

This research explains the method of perception mapping usually used in marketing surveys, which can also be applied to the field of FP, especially in promotion of mixed contraception. The large sample size used in this study provides adequate power to examine the perceptual mapping. This study also has certain limitations: data were collected in 2015; as is the scientific evidence in previous studies, the perception of women of childbearing age at this time may also have changed based on segmentation, place, and time.

Conclusion

When all aspects of FP methods are considered together, the most preferred method was the injectables, followed by the pills. Injectables and pills were the most preferred because people believe that they were 'easy to use' and 'easy to get'. The least preferred methods were tubectomy and vasectomy because the respondents thought those were not close to any attributes at all.

Recommendation

These results suggest that the perceptual mapping of mixed contraception could be a method of improving communication messages for the FP programmes, notably in developing Information Education and Communication (IEC) strategies and materials. The FP methods with the most positive image in East Java and NTB are the pill and the injection with regard to the attributes 'easy to use' and 'easy to get'. To increase the demand for the LAPM choice in the provinces of East Java and NTB, the attributes 'easy to use' and 'easy to get' should be emphasized in the LAPM IEC messages.

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Author contributions

F.Y. collected the data; S.Han analyzed the data and article writing and editing; R.D. and I.A. methodology, writing and review; S.Har review and editing; Y.W. carried out project design and review; D.S. is the principal investigator.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical clearance for this study was obtained from the institutional review board of Johns Hopkins Bloomberg School of Public Health (IRB No. 4981) as well as from the Faculty of Public Health, Universitas Indonesia (Ref: 149/H2.F10/PPM.00.02/2015).

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Informed consent

Written informed consent was obtained from all subjects before the study.

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Supplemental material

Supplemental material for this article is available online.

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