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Controlling model of contraceptive devices and medicines availability based on women of childbearing age need and demand: a cross sectional study in East Kotawaringin Regency, Indonesia

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ABSTRACT

Background: One of the issues in family planning program in Indonesia is the availability of contraceptive devices and medicines. The aimed of this study was to find a model for controlling of contraceptives availability based on women of childbearing age need and demand. *Methods:* This study used cross-sectional design. Total sample was 98 acceptors and 5 primary healthcare centers. The need-demand aspects were analyzed by quantitative design. Aspects of contraceptive logistic management were analyzed by qualitative design. The quantitative and qualitative results were combined through a Focus Group Discussion. *Results:* Need had very strong relationship with demand (coefficient value= 0.872) and there was a significant relationship between need and demand where the t-statistic value (22.776) was greater than the t-table (1.98). In addition, it was also found that the availability of contraceptive devices and medicines had an effect on the use of contraceptive devices and medicines indirectly through the mediation of acceptor need (t-statistic= 2.567). Based on the results of the FGD, the availability of contraceptive devices and medicines were the factor that most plays role in need and demand of WCA. *Conclusion:* The model can be used to develop strategy to control stagnant and stock out incident.

Keywords

Contraceptive; Stock out and stagnant; Contraceptive devices; Medicines availability

Introduction (Times New Roman, bold, 12)

The use of contraceptive devices and medicines in accordance with the interests and conditions of the community's need are the factor that influences the success of family planning programs (Skiles et al., 2015, Cavallaro et al., 2016, Rathore, 2016) such as timing of pregnancy, the number of children, and the ideal birth spacing of children (Starbird et al., 2016). Therefore, it is necessary to have the availability of contraceptive devices and medicines in accordance with the demand (Skiles et al., 2015). The Indonesian government has set a policy for the procurement and distribution of contraceptive devices and medicines, covering activities for planning needs, provision and distribution (Indonesia, 2009). The supply of contraceptive devices and medicines is focused on the balance between the needs, supplies and the community's interest (Kumar and Karthik, 2014, Mahilange, 2016). It is necessary to improve the logistics management so the supply of contraceptive devices and medicines can be maintained as well as to ensure the availability of the contraceptive in health care services (Mukasa et al., 2017), especially primary healthcare centers (Daff et al., 2014).

One of the problem in family planning services is the high unmet need for family planning (Alkema et al., 2013). The data showed unmet need of contraceptive in 2019 in East Kotawaringin Regency, Indonesia, was 10.25%, this number has not yet reached the target of 9.91% (Berencana, 2019). The factors affecting these conditions are the inaccessibility of services and poor commodity availability of contraceptive devices (Bradley et al., 2007).

This study aims to find model for controlling contraceptive devices and medicines availability based on acceptors need and demand. This study are expected to determine the policies related to the supply chain of contraceptive in primary healthcare centers in Indonesia.

Methods

Design

This was an observational study and used cross sectional design. This study used two aspects, namely the need-demand and the logistic management of contraceptive aspect. The study was conducted in East Kotawaringin Regency, Central Kalimantan from August to October 2020. The dependent variables in this study were acceptor need and contraceptives availability. The dependent variable of this study was contraceptive use (demand).

Ethical consideration

The procedure of this study was granted by the ethical review board from the Faculty of Dental Medicine, Universitas Airlangga, Indonesia (number 413/HRECC.FODM/IX/2020).

Population

This study used quantitative and qualitative analysis methods. The sample of need and demand aspect were women of childbearing age, the contraceptive acceptors and who live in the working area of the primary healthcare centers, East Kotawaringin Regency, Central Kalimantan, Indonesia. Primary data were collected through a questionnaire. The sample of contraceptive logistic management aspect were 5 primary healthcare centers in East Kotawaringin Regency, Central Kalimantan, Indonesia. Data were collected from documents, medical records, and contraceptive reports. This secondary data were used to validate the information that provided by the contraceptive officer at the primary health-care center. We used multistage random sampling technique. Total sample was 98 women.

Data analyzed

The questionnaire related to the need-demand aspect was analyzed using descriptive statistics and Partial Least Square Test to investigate the relationship between need and demand. The results of interviews and secondary data related to the logistic management of contraceptive aspect were analyzed using triangulation. The data were combined through a Focus Group Discussion (FGD) to gain the final model of this study.

Results and Discussion

Need and Demand Aspect

Needs are basic and necessary to meet human problems. Need and demand will motivate someone to take action. People's perception of the quality of health services will raise the demand. Demand is the number of products or services desired, and it is supported by an economic willingness such as buying and utilizing the services (Supriyanto and Ernawati, 2010, Skou and Niakas, 2005). The distribution of contraceptive need is related to the contraceptive's demand used by respondents were showed in table 1.

Table 1. The need and demand frequency distribution

Type of contraception	Need		Demand	
	n	%	n	%
Contraceptive pill	22	22.4	25	25.5
Contraceptive Injection	28	28.6	24	24.5
IUD	20	20.4	24	24,5
Implant	28	28.6	25	25.5
Total	98	100.0	98	100.0

Table 1 showed that the most needed contraceptive were injection and implant. The number of need and demand for each contraceptive was different. There were some respondents who did not use contraception according to their needs. The contraceptives used according to their needs were called satisfied demand. Contraceptives that did not fit the needs were unsatisfied demand. The mismatch between the need and used demand can be caused by the unavailability of contraceptive devices and medicines at the primary healthcare center.

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The availability of contraceptives at the Primary health care center is very important to increase the use of contraceptives by family planning acceptors. The more available a contraceptive device, the acceptor will tend to use contraceptives. Table 2 showed the distribution for contraceptive availability.

Table 2. Distribution for contraceptive availability

Contraceptive availability	Frequency (n)	Percentage (%)
Difficult to obtain	0	0
Easy enough to obtain	0	0
Easy to obtain	42	43
Very easy to obtain	56	57
Total	98	100

Respondents could access the contraceptive was very easy because it was often always available at the primary health care center.

Figure 1 showed the model of relationship between need and demand was analyzed using Partial Least Square test.

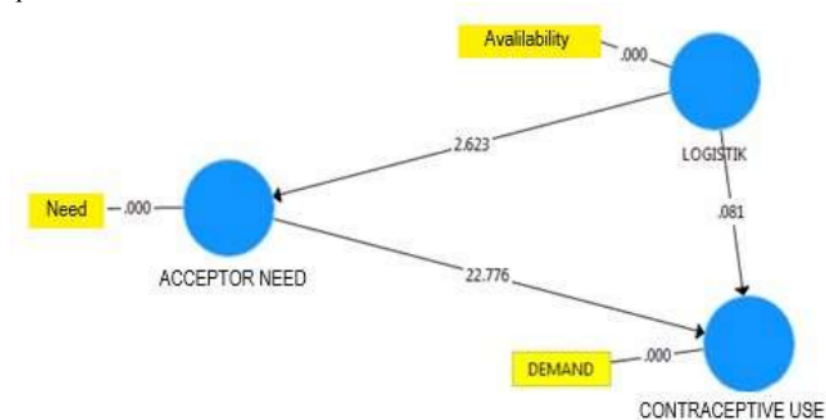


Figure 1. Model of need and demand aspect

The figure 1 showed that acceptor need had strong relationship with demand (coefficient value= 0.872) and there was a significant relationship between the need and the demand, which t-statistic (22.776) was greater than the t-table (1.98). In addition, it was also found that the availability of contraceptive devices and medicines based on acceptors perception (Availability) does not have a significant direct effect on contraceptive use, but it had effect on the use of contraceptive devices and medicines indirectly through the mediation of acceptor need (t-statistic = 2.567).

Contraceptive devices and medicines management at primary health-care centers

Selection

Selection is the most important stage in the logistic management of contraceptives at primary healthcare center. Primary healthcare centers must be able to predict contraceptive needs accurately, in order to obtain an appropriate supply of contraceptive (Kearney, 2004). The basis for planning is the average use of contraceptives per month, the number of stock, number of visits, number of couples or reproductive age, the achievement of contraceptive use for one year, number of enthusiasts, and trends in contraception use. Working stock, buffer stock, remaining stock, and lead time are important number to calculate the stock (Supply, 1997, Deliver, 2011). In addition, the most accurate method of planning was to use previous data in contraceptive used (Kearney, 2004, Krug et al., 2020).

Procurement

The results of the planning in selection stage was used as the basis for requesting contraceptive devices and drugs in procurement stage. Contraceptive management officer will calculate the degree of contraceptive procurement and will order from the supplier. The requesting of the contraceptive is written on request form. Contraceptive management officer must pay attention to several things such as working stock, buffer stock, remaining stock, and lead time to order (Supply, 1997, Deliver, 2011). The request form must be submitted directly to the suppliers. The

delay in the arrival of contraceptive can affect the level of drug supplies, which can cause stagnant or stock out (Febreani and Chalidyanto, Levesque et al., 2013).

Receipt

Our study showed that the contraceptive devices and medicines are received by the family planning management officers at the primary health-care centers. They have to check the number of contraceptives, the type of contraceptive, the expiration date, the condition of the package, and the physical condition of the contraceptive. This condition was similar with other studies that found officers are obliged to check and validate the condition of the drugs (Jha, 2015). The officers must conduct the documentation (Febreani and Chalidyanto).

Storage

Our study showed storage of contraceptives as located in the family planning service room. The storage had adequate ventilation, air circulation and lighting. The service room cleaned every day. The number of contraceptive was adjusted by the capacity of the contraceptive storage area. Only officers could access this storage. Contraceptive was arranged in shelves according to dosage form. Organoleptic quality checks of contraceptive was carried out before the distribution to the acceptors. However, they did not have a stock card. Contraceptive received at primary health-care centers must put in standard storage (Deliver, 2011) as well as good storage (Baral et al., 2020) so that acceptors can receive them in good condition. Table 3 showed the fit of percentage of storing contraceptive devices and medicines with the standard of drug storage.

Table 3: The average percentage of storing contraceptive devices and medicines in primary healthcare centers

Type of contraception	Percentage (%)
IUD	70.00
Implant	69.17
Contraceptive injection	69.17
Contraceptive pill	69.17

Table 3 showed that primary healthcare center's storage is inappropriate with the requirements by the Ministry of Health Indonesia. Based on the average percentage, the quality of storage of contraceptives devices and medicines is in the medium category (medium category if the score of average percentage between 60 –70). Appropriate storage according to the Ministry of Health of the Republic Indonesia requires that the storage must have stock cards, be clean, have adequate air circulation, safe, use principles of First Expired First Out (FEFO) and First In First Out (FIFO), procedures for storing damaged contraceptive, expired contraceptives and stagnant contraceptives, as well as documentation (Febreani and Chalidyanto, Indonesia, 2002).

Distribution and Counseling

Our study showed that counseling was a stage in management logistic of contraceptive that affects the distribution and use of contraceptive devices and medicines. The total number of family planning officers who provide counseling at primary health-care centers were from four to eight persons; however, not all the officers had attended training in IEC (Information, Education,

and Communication). The information that was delivered by the officers were the types of contraceptive at the primary healthcare center, the right types of contraceptive for acceptors, the side effects of contraceptives, how to use contraceptive devices or contraceptive drugs, the purpose of using the contraceptive, the age of the prospective acceptor, and the time period for using the contraceptive.

Counseling is very important in helping acceptors to determine the need of contraceptives devices and medicines and to decide which one to use. Counseling is a place for acceptors to gather information about contraceptives and the type of contraceptives that appropriate with their needs (Indonesia, 2014). Fear of side effects of contraceptives had a role in respondents' decision. This situation is influenced by limited information . IEC is needed to provide understanding to acceptors so that stigma can be eliminated and the officers need to attended training of IEC (Mukasa et al., 2017, Bradley et al., 2007).

Further, distribution has an important role in the health logistics system (Chaiboonruang, 2018). Distribution starts from the suppliers, and the storage area to the end customer (Khoukhi et al., 2019). Furthermore, the officers reported to the procurement unit. The goal of distribution process are the contraceptive received by health workers and distributed appropriately to the patients (Deliver).

Contraceptive devices and medicines stock at primary health-care centers

Table 4 showed the average percentage of contraceptive devices and medicines stock at primary health-care centers, East Kotawaringin Regency. Contraceptive pills were the most stagnant in 2019 and 2020, while the most stock out was implants.

Table 3: The average percentage of contraceptive devices and medicines stock at primary health-care centers research

Type of contraception	Stagnant (%)		Stock out (%)	
	2019	2020	2019	2020
IUD	35	33.33	15	13.33
Implant	20	26.67	40	26.67
Contraceptive injection	25	60.00	40	13.33
Contraceptive pill	70	86.67	10	6.67

Tables 4 that the contraceptive pill was the most stagnant and implant was the most stock out contraceptive. The availability of contraceptive at the primary health-care centers affected the contraceptive devices and medicines use. These conditions had impact on family planning services at the primary health-care center (Supply). The stagnant condition has a risk of expiration of the contraceptive, while stocked condition has a risk of insufficient community needs (Mukasa et al., 2017).

Controlling the availability of contraceptive is determined by demand, reorder level, stock out and stagnant (Rosmania and Supriyanto, 2015). The problems that often occur in controlling

supply are stock out and stagnant. Stagnant occurs due to the low demand and the supply is in excess, while stock out occurs due to the high demand and the supply is limited (Bradley et al., 2007). Inventory of contraceptive devices and medicines must be carried out carefully. The calculations need to consider buffer stock, waiting time and stock taking to minimize losses (Daff et al., 2014).

We conducted FGD to combine quantitative and qualitative results to find acceptable model to control contraceptive devices and medicines availability in primary healthcare center. The model for controlling contraceptive devices and medicines availability in primary healthcare center in Indonesia based on acceptors need and demand is shown in figure 2.

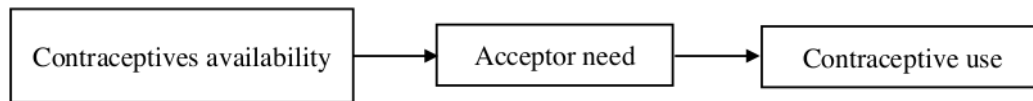


Figure 2. Model of controlling contraceptives availability in primary health-care centers based on supply-demand chain management

The model explained that demand were influenced by acceptor need. The availability of contraceptive devices and medicines had effect on the use of contraceptive devices and medicines indirectly through the mediation of acceptor need. Based on qualitative study, the availability of contraceptive devices and medicines were influenced by selection (planning) stage. Good planning affected the contraceptive management cycle, starting from the order to the suppliers until distribution to the acceptors (Satibi et al., 2019). Planning is the most important part in the logistics management cycle. Good planning ensures the supply chain of contraceptive in primary health-care centers. The availability of contraceptives affects the use of contraceptives because if all types of contraceptives are available in health services according to the choices and needs of the acceptors, acceptor will tend to use contraceptives.

Conclusion

The model of controlling the availability of contraceptive devices and medicines in primary healthcare center can be used to develop strategy to control stagnant and stock out incident by considering the influence of acceptor need and the availability of contraceptive devices and medicines when doing the selection stage of contraceptive devices and medicine.

Limitation

Certain limitations are considered in our study, not all factors were evaluated in our study Further study is needed to evaluate the others factors. However our study can be generalized only in the availability, need, and demand.

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Conflict of interest

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