JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.1-4

EDITORIAL

FROM REPRODUCTIVE HEALTH TO UNPREPARED HEALTH SYSTEM STRUCTURE: REMEMBERING WHY WE START THE DIGITAL HEALTH

Dari Kesehatan Reproduksi hingga Belum Siapnya Struktur Sistem Kesehatan: Mengingat Mengapa Kita Memulai Kesehatan Berbasis Digital

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The COVID-19 pandemic brought blessings in disguise to how we should run the new era of digital health. As the developing country with unsolved health problems, Indonesia needs some "forces" to reach the new era of health digitalization. This era is the time to enter the new order of healthcare services. The Volume 8 Number 1 was prepared before the pandemic started, but the articles were totally related to the ongoing disruption. We published our current edition by underlining the prospective of digital health on their respect of old-fashioned health problems in Indonesia. Three main topics were covered in this edition; how we start the digital health, what should be prepared, and what health problems should be addressed.

Never Ending Story of Reproductive Health Problems

Maternal mortality remains a problem for Indonesia. Even though it has been decreasing since 2000, the Maternal Mortality Rate in Indonesia is still high (177 per 100,000 live births in 2017) (United Nations Children's Fund, 2019). Acknowledging that the Maternal Mortality Rate is preventable, Indonesia was committed to sign the 1994 International Conference on Population and Development (ICPD). This commitment is the cornerstone for countries throughout the world in mainstreaming the reproductive health in every population and development programs (United Nations Population Fund, 1994). Nowadays, the ICPD is still relevant, and it has then been transformed into various health strategies including the Sustainable Development Goals (SDGs).

Operationalizing their commitment on reproductive health, Indonesia has implemented various health programs. Our authors underlined the two most recent programs designed by the Government in handling the reproductive health problems in Indonesia, i.e. the Family Planning Village Program and Breastfeeding Support Group Program. Even though both of these programs were built based on the concept of community empowerment, our authors in these two articles used a different research method in investigating the program's effectiveness.

Using a mixed-method approach, Huda, Baroya, Sandra, and Hariastuti (2020) concluded that the implementation of the Family Planning Village is promising to raise the acceptance of long-term contraceptive method among couples in childbearing age. Their study suggested that improving communication skill of health cadres would definitely boost the successfulness possibility of these

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programs. An article written by Hasanah, Putri, and Pramono (2020) also pointed out similar results of the Breastfeeding Support Group Program. By comparing two different designs of program in the community, they showed the important factors that should be accommodated to sustain community empowerment programs on reproductive health. We also presented an article that discussed about reproductive healthcare for marginalized people. Noffritasari, Shaluhiyah and Adi (2020) reported that stigmatization is still bold issue yet unaddressed barrier in providing accessible reproductive healthcare for Lesbian Gay Bisexual and Transgender community. Echoing what Huda et al. (2020) have suggested, Noffritasari, Shaluhiyah and Adi (2020) also suggested that communication skill of health providers is important for the program.

Unprepared Structure of Health System

Health system is composed by its correlated components. What happened in the outcome is determined by the structure and the process that engine the system itself. This edition also underlined what should be repaired in the structure and process of the health system.

Laksono, Ridlo, and Ernawaty (2020) reopened our memory to the unequal distribution of physicians in Indonesia. The issue of health provider distribution has still been happening even after Indonesia has implemented various policies for its human workforce and decentralization. Their article suggested the emerging of redistribution policy in Indonesia. Another article in this edition also strengthened the code blue condition in Indonesia health workers condition. Different from Laksono, Ridlo, and Ernawaty (2020), the two other papers focused on how the health workforce plays a role more in health policy implementation rather than as the policy object.

Rahmawati and Prastika (2020) conducted their study in one of the government-owned hospitals that regulates generic drug prescription for their patients. They reported the lack of physicians' knowledge of the generic drugs prescription. Their paper reported that there was a strong correlation between the specialization of physicians and their responsibility for pescribing generic drugs. Even though the physicians had a great sense of responsibility in prescribing generic drugs, insufficient knowledge on this topic would lead them to ineffective policy of generic drug prescription.

Physicians are responsible to not only provide standardized medical treatments but also make their hospital survive in the high-cost industry. A paper written by Siswanto and Chalidyanto (2020) reported a surprising result which mentioned that compliance of physicians with the clinical pathway did not bring any significant change on the patients' length of stay. This paper raised numerous potential factors that the hospital management should consider to shortening the length of stay more rather than pushing their doctors'clinical pathway compliance.

The Emerging Digital Health

In 2020, World Health Organization published their first draft on Global Strategy on Digital Health 2020-2024. It was mentioned that this draft aimed to promote healthy lives and well-being for everyone and everywhere at all ages (World Health Organization, 2020). This strategy explains the demand on the integration of financial, organizational, human and technological resources in the digital health implementation. The COVID19 pandemic was believed as the turning point for every single country to build their digital health. The rising of digital health platform happened not only in developed countries but also in low and middle countries. It revolutionizes how people access

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healthcare services to promote their health and well-being.

In this edition, we highlighted the rising of digital health issues by choosing two articles. The first article presentd how the local government in Indonesia has tried to promote the e-health at primary healthcare centers. Adian and Budiarto (2020) reviewed that e-health successfully provides an accessible route for lay people to reach primary healthcare centers. It minimized the opportunity loss during accessing healthcare. It is easy for some people but still hard for people with low literacy. Patel (2020) presented the possible problems resulted from unprepared digital health implementation. She underlined the importance of healthcare organization to secure their data system. Social engineering attacks in healthcare organizations was explained by considering the vulnerabilities of digital health data system. Her article also presented the prevention measures which health mangers who develop the digital health data system should understand.

All in all, this edition brought an insightful study that translated how should health managers deal with the development of digital health. Digital health is the future of healthcare services, but health managers should also aware of the journey of health system up to this period. The issues from reproductive health to unprepared health system structure must be addressed in the digital health. Remembering why we start the digital health will help us innovate and survive during the digital health disruption.

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ORIGINAL RESEARCH

THE EFFECTIVENESS OF FORMING BREASTFEEDING SUPPORT GROUP PROGRAMS TO IMPROVE EXCLUSIVE BREASTFEEDING

Efektivitas Pembentukan Program Kelompok Pendukung ASI untuk Meningkatkan ASI Eksklusif

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ABSTRACT

Background: Child and maternal health in Indonesia can be improved by promoting the practice of exclusive breastfeeding, which can be done through the formation of breastfeeding support groups. The villages of Sugihwaras and Sumbergede have initiated breastfeeding support groups; however, the two villages differ in the framework of their programs and their intervention methods for pregnant and breastfeeding mothers.
Aim: This paper analyzes the effectiveness of support groups in these two villages to improve the rate of exclusive breastfeeding.
Methods: Using a case study approach, a comparative analysis was done using a total sampling technique and descriptive analysis. Samples were selected from the Fieldwork Report of Groups 14 and 15, Faculty of Public Health, University Airlangga from 2017 to 2018, and the study compared the community's characteristics (as input), program management (as process), and results in forming breastfeeding support groups (as output)
Results: The two villages had similar community characteristics, and the average duration of each program was the same. Sumbergede focused on forming a framework of support for the breastfeeding support group, while Sugihwaras focused on breastfeeding mothers and their husbands. Indicator analysis of the program showed that Sumbergede (80% achieved) had a 5.71% higher percentage of attainment compared to Sugihwaras (85.71% achieved). Analysis of the program's strengths and weaknesses showed that Sumbergede had more success and power in resources in its region.
Conclusion: The intervention program in Sumbergede was more effective. It has a greater potential to be a sustainable program that will achieve a 100% rate of exclusive breastfeeding within the next year.

Keywords: breastfeeding support group, exclusive breastfeeding, intervention, effectiveness.

ABSTRAK

Latar Belakang: *ASI Eksklusif merupakan isu kesehatan ibu dan anak di Indonesia. Dengan Kelompok Pendukung ASI (KP-ASI), ASI ekslusif diharapkan dapat ditingkatkan. Desa Sugihwaras dan Desa Sumbergede merupakan dua desa yang sedang mewujudkan program KP-ASI. Namun, perumusan program pembentukan KP-ASI dan bentuk atau metode pemberian intervensi pada ibu hamil dan ibu menyusui di kedua desa tersebut berbeda.*
Tujuan: *Untuk menganalisis keefektifan program pembentukan KP-ASI dan pelaksanaan program intervensi pada ibu hamil dan menyusui dalam meningkatkan perilaku ASI Eksklusif di Desa Sugihwaras dan Sumbergede.*
Metode: *Penelitian ini menggunakan pendekatan studi case terhadap dua program pembentukan KP-ASI. Analisis perbandingan dilakukan secara deskriptif dengan pengambilan sampel dari data Laporan Praktik Kerja Lapangan (PKL) Kelompok 14 dan 15 Tahun Akademik 2017/2018, Fakultas Kesehatan Masyarakat, Universitas Airlangga. Penelitian ini menggunakan teknik total samplng dan analisis deskriptif dengan membandingkan karakteristik masyarakat (input), bentuk intervensi dan pengelolaan program (proses), dan hasil evaluasi pembetukan KP-ASI (output).*
Hasil: *Karakteristik masyarakat cenderung sama, dan rata-rata durasi program kedua desa sama. Desa Sumbergede berfokus pada kesiapan program pembentukan kader KP-ASI, Desa Sugihwaras berfokus pada ibu menyusui dan suami. Analisis indikator keberhasilan program menyatakan Desa Sumbergede memiliki persentase ketercapaian 5,71% lebih tinggi. Analisis kelebihan dan kekurangan program menemukan Desa Sumbergede lebih berhasil dan memiliki keunggulan pada sumber daya di wilayahnya.*

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Kesimpulan: *Program intervensi di Desa Sumbergede cenderung lebih efektif. Program intervensi tersebut memiliki potensi yang lebih besar untuk menjadi program yang berkelanjutan pada tahun berikutnya untuk meningkatkan 100% ASI Eksklusif.*

Kata kunci*: Kelompok Pendukung ASI, ASI Eksklusif, intervensi, efektivitas.*

Received: 10 November 2018 ***Accepted: 11 November 2019*** ***Published: 28 March 2020***

INTRODUCTION

The second of the United Nations' Sustainable Development Goals (SDGs) focuses on ending hunger, achieving better food security, improving nutrition, and promoting sustainable agriculture. Health sectors should ensure that babies have a sufficient quantity of safe and nutritious food throughout the year. The principles of this goal have been embedded in Indonesia's First 1,000 Days of Life program, which gives infants the opportunity for a lifetime of better health (Cusick and Georgieff, no date). During this period, humans experience their most rapid rate of growth, and adequate nutrition is essential for babies and mothers, which can best be achieved by breastfeeding (Indonesian Republic Government, 2012).

Exclusive breastfeeding is defined as providing breastmilk for infants in the first six months without adding and/or substituting other foods or drinks. The Indonesian Healthy Family Approach in 2016, compiled by the Ministry of Health, stated that exclusive breastfeeding for infants (from birth to six months) is an indicator of a healthy family. The World Health Organization (WHO) also recommends that all infants should be exclusively breastfed from birth to six months of age. After that, children should receive supplemental foods but continue to breastfeed for at least two years (Indonesian Ministry of Health, 2016).

The 2016 Breastfeeding Series produced by *The Lancet* showed that exclusive breastfeeding could decrease mortality from infections by 88% worldwide in infants under age three. It also showed that 31.36% to 37.94% of children became sick because they did not exclusively breastfeed (Hajeebhoy, 2016). In several Indonesian regions, however, the rate of exclusive breastfeeding is still inadequate.

The 2017 Bojonegoro District Health Profile Data showed that the rate of exclusive breastfeeding had decreased during the previous two years: 89.4% in 2015 and 88.2% in 2016. Likewise, the rate of exclusive breastfeeding in the Nglumber Primary Healthcare Center in the Kepoh Baru subdistrict reached only 70.3% (Bojonegoro District Health Office, 2017).

The Nglumber Primary Healthcare Center is a first-level primary health facility responsible for public health in its region. This includes two villages that had not reached a 100% rate of exclusive breastfeeding: Sumbergede and Sugihwaras; these are two of the 25 villages in the Kepoh Baru subdistrict, and Sugihwaras is located to the east of Sumbergede.

Both internal and external factors have prevented these villages from reaching the desired breastfeeding goals. The internal factors include the mother's knowledge about breastfeeding, her level of education, the family's employment status, and their socioeconomic conditions. The external factors include the availability of health care facilities, the work environment, and the community and family closest to the mother. The family's importance as a motivating factor for the mother is often overlooked (Februhartanty *et al.*, 2012). Encouragement and physical support during breastfeeding determine the success of achieving the goal of exclusive breastfeeding. The family, especially the husband, influences the mother's emotional well-being and fosters a sense of

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self-confidence. Thus, mothers with this support are more enthusiastic and consistent in providing exclusive breastfeeding for their babies. The source of motivation, however, cannot just come from family but also depends on the wider community (Raffle *et al.*, 2011).

Access to a breastfeeding support group is also known to be one of the ten steps to successful breastfeeding, according to the WHO (2019). A breastfeeding support group is formed by 6 to 12 pregnant women and new mothers who hold regular in-home meetings. The group exchanges experiences, discusses challenges, and provides mutual support related to maternal and child health, especially pregnancy, breastfeeding, and nutritional fulfillment. Breastfeeding support groups are created specifically for mothers who want to initiate breastfeeding at birth and continue it exclusively for six months; after six months, breastfeeding continues but is supplemented with other food.

The Indonesian Ministry of Women Empowerment and Child Protection stated that breastfeeding support groups should be formed by community health facilities to support pregnant women, new mothers, and caregivers. Breastfeeding support groups can include breastfeeding mothers, husbands, families, community leaders, and religious leaders.

Groups in health-care facilities also include professional staff (the Ministry of Women Empowerment and Child Protection, 2010).

Breastfeeding support groups are vital because mothers will have a sense of being supported, cared for, and loved. This creates positive emotions that will increase the mother's oxytocin hormones and subsequent milk production. Breastfeeding support groups encourage pregnant women to have the confidence to breastfeed (Yunianti, Rofi'ah, and Rubiyanti, 2017). Breastfeeding mothers can gain knowledge and learn from the experiences of other breastfeeding mothers; thus, babies will get the best food and nutrition from birth. The motivation of husbands and family members is also needed to ensure the success of breastfeeding, as are the health-care workers who provide support for the group members (Yunianti, Rofi'ah, and Rubiyanti, 2017).

Breastfeeding support groups provide more opportunities for breastfeeding mothers to actively participate in health promotion and education. Education can come through one-way methods such as counseling, workshops, and pamphlets given to the mother. Breastfeeding support groups, however, provide a two-way exchange of information, and the advice and sharing of each participant's knowledge and experience help the other breastfeeding mothers to overcome obstacles and constraints.

A study about breastfeeding support groups at Wonoayu Primary Healthcare Center in Sidoarjo City found that mothers who participated in the groups were 3.7 times more likely to breastfeed exclusively compared to the mothers who did not participate (Wati and Muniroh, 2018). In another study, at the Kasihan Primary Healthcare Center in the Working Area II of Bantu, there was a significant 72.4% relationship between participation in a breastfeeding support group and the success of exclusive breastfeeding for infants aged six to nine months (Purwanti, 2015). According to research conducted by Nurrohmah, Prawitasari, and Nisman (2015), a mother's participation in a breastfeeding support group significantly affected exclusive breastfeeding behavior, which was 12.85 times higher than in women who did not participate. Support from husbands and the wider social structure also affected exclusive breastfeeding behavior (Nurrohmah, Prawitasari, and Nisman, 2015).

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In line with this past research, the villages of Sugihwaras and Sumbergede created a program of breastfeeding support groups that sought to increase the mothers' motivation to breastfeed during the crucial period from birth to six months.

Although two villages might have the same challenges and causal factors, this study showed that interventions might be different based on local culture, the capabilities of the community, the capacity of those who intervene, the availability of support facilities, and other factors.

Midwives led the breastfeeding support groups, and the villages recruited volunteers to assist in the effort.

Although the support groups used different methods, this study sought to compare which forms of interventions or programs were more effective and had the potential to be continued in subsequent years. The results could provide suggestions and influence decision-making for villages that share Sugihwaras and Sumbergede's characteristics and challenges.

METHODS

A case study approach was used to analyze breastfeeding support group programs. It compared interventions, education, and actions within the community to maintain breastfeeding support groups that would improve exclusive breastfeeding behavior.

The subjects were selected from two villages in the Kepoh Baru Subdistrict, Bojonegoro District (the villages of Sugihwaras and Sumbergede. The sampling came from data compiled in the Field Work Report of Groups 14 and 15, from 2017 to 2018, by students from the Faculty of Public Health, University Airlangga.

The inclusion criteria selected women with a child less than two years old who participated in a breastfeeding support group reinforced by volunteers, community leaders, and the village's government. The selected sample size used total sampling, and there were 74 samples from both villages.

A descriptive analysis compared the community's characteristics (as input), the forms of intervention or program (as a process), and the attainment of the program's success (as an output). The community's characteristics and forms of intervention were independent variables, while the effectiveness of the breastfeeding support group program was a dependent variable.

To simplify the analysis, the participants in Sugihwaras were assigned to Group A, while the Sumbergede participants were placed in Group B. The potential sustainability of the support group formation was based on the most effective analysis. Indicators that determined the effectiveness of the program could be obtained by calculating the percentage of success based on evaluating each intervention or program and comparing the strengths and weaknesses of each program.

RESULTS AND DISCUSSION

Community Characteristics

The adjoining villages of Sugihwaras and Sumbergede had relatively similar community characteristics when education, work, culture, overall health status, and medical challenges were compared. Understanding the community's characteristics was essential and had to be correctly performed by the researchers to gauge the intervention. The communities' conditions, capacities, strengths, values, and norms are shown in Table 1.

Fifty percent of respondents had a junior high school or high school certificate, but the overall education level was relatively low, with only 11% of the

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community having graduated from higher education.

Most people were middle-class and worked as farmers, farm laborers, and employees of private companies.

Each town had roughly equal numbers of men compared to women.

A study showed that sociodemographic and psycho-social characteristics positively influence the duration of breastfeeding (Bosnjak *et al.*, 2009). These characteristics include when the decision to breastfeed was made, the intended duration of breastfeeding, the household income, and the smoking habits of the mother during pregnancy. Mothers who breastfed just after birth and who attended breastfeeding support groups would most often breastfeed for at least six months. Mothers breastfed for longer than six months if they had a higher monthly household income and did not smoke during pregnancy (Bosnjak *et al.*, 2009).

Analysis of Intervention Programs

Many women are provided with education and counseling to promote exclusive breastfeeding, but these methods do not improve the rate and length of breastfeeding. Breastfeeding mothers need skills and support from their peers to give them trust, acceptance, recognition, and appreciation. The most effective support comes from peer groups that share the same experience and community characteristics (Susilo, Kurdant, and Siswati, 2012).

To achieve the exclusive breastfeeding coverage, both groups conducted a breastfeeding program in Sugihwaras and Sumbergede. Two programs were created that were each informed by different theories for breastfeeding support. Both villages have several activities in one program. Table 2 shows the differences between the breastfeeding support programs assigned to Groups A and B.

The number of activities in each group was carried out in a 4:3 ratio, meaning that the interventions given to Group A were more intensive than those given to Group B. Due to the intensity of meeting, Group A met four times per month, while Group B met only three times. The average duration of the activities in Group A was two hours and 15 minutes, while Group B had an average duration of two hours and 20 minutes.

Interventions in both groups provided health promotion and education with the end result of promoting exclusive breastfeeding. They both had the same targets: pregnant and breastfeeding mothers and their husbands. However, the target of Group A comes from immunization volunteers who also get involved in breastfeeding support group since the Group A does not have enough incentives for additional volunteers. Thus, these volunteers accompany pregnant women and breastfeeding mothers in the breastfeeding program.

Table 1. Comparative Analysis of Community Characteristics in Group A and Group B.

Comparison Variables	(%)	
	Group A	Group B
Education level		
- Senior High School	31.36%	60.56%
- Junior High School	42.46%	17.91%
- Elementary School	17.76%	11.10%
- Others	8.42%	10.43%

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Work type		
- Farmers	44.93%	33.13%
- Farm laborers	19.91%	13,00%
- Employees of private companies	12.51%	13.09%
- Small and medium level of enterprises	6.93%	00.00%
- Others	15.72%	4.62%
- Indeterminate work	00.00%	36.16%
Gender distribution		
- Men	49.00%	50.95%
- Women	50.67%	49.03%

Source: Field Work Practice Report (14&15 group) 2017/2018, Faculty of Public Health, Universitas Airlangga

The frameworks for activities in the two groups were different: Group A conducted a workshop, while Group B held a sharing session. The workshop was more scientific and serious, while the sharing session was more flexible and conveyed the speakers' personal experiences. The programs had a different duration of activities, and the workshops conducted by Group A had richer information compared to the sharing session. The workshops covered a particular theory related to the benefits of exclusive breastfeeding: the ideal way to breastfeed, the introduction of breastmilk pumps, and the proper way to express breastmilk. The introduction of the breastmilk pump provided alternatives for working mothers who breastfeed. Effectiveness of giving breastmilk pumps as rewards has not been unproven yet. Using breastmilk pumps increased the number of mothers who expressed breastmilk (Crossland *et al.*, 2016); Mothers who work are often unable to provide exclusive breastfeeding to their children.

The success of the information provided in the activities was evaluated based on the results of a pre-test and post-test. Using media for conducting activities in each group indicates that Group A was more skilled in delivering information to the participants; by using more varied media, the participants were more receptive to the conveyed information. Media that clearly and directly described the right implementation of the information were beneficial for participants, and thus they did not need to imagine how to implement the information into daily life. In Activity II, both groups used an individual approach through a home visit.

Participants in the program included families, the closest people to the breastfeeding mothers, and community groups that motivated breastfeeding. Although the names and concepts of Activity II for each group were different, the activities had the same goal: to enhance support from the social environment around the breastfeeding mothers. For example, people in the mothers' environment may increase the mothers' self-confidence to carry out exclusive breastfeeding until their babies were six months old.

In the study "The effect of breastfeeding exclusive training on knowledge in breastfeeding support groups," there was a significant increase in mothers' knowledge ($p < 0.05$) before and after training and formation of breastfeeding support groups in Mekargalih and Cipacing villages in the Jatinangor subdistrict. Hence, the formation and training of a breastfeeding support group can encourage mothers to adhere to exclusive breastfeeding (Sri, Judistiani, and Indra, 2016).

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Table 2. Analysis of the Intervention Program in Groups A and B

Intervention Program	
Group A	**Group B**
Activity I "Get Ready to be Exclusive Breastfeeding Village" Workshop *(Workshop SIAP DESASI)* - Description: activities run by signing an approval petition of *SIAP DESASI* program, conducting a pre-test and post-test, transfer of information, demonstration of ideal breastfeeding procedures, question-answer sessions - Target: pregnant women, breastfeeding mothers - Media: public service advertisements, baby mannequins, petition banner - Topic: exclusive breastfeeding, benefits of breastfeeding for mothers and babies, breastfeeding support groups, socialization of ideal breastfeeding procedures and breastmilk pumps - Pre-test and post-test (a decrease of 8% in the high-value category) - Duration: three hours - Cost: IDR 1,193,500	Activity I Exclusive Breastfeeding Fun Sharing Session (*Sharing session TALK SIK ASIEK*) - Description: activities are in a sharing sessionformat to show the importance of exclusive breastfeeding and share questions and answers with educational videos - Target: fertile couples - Media: public service advertisements - Topic: exclusive breastfeeding, nutrition fulfillment for mothers, benefits of exclusive breastfeeding for fertile couples - Pre-test and post-test (an increase of 18.75% in behavior) - Duration: two hours - Cost: IDR 484,000
Activity II One fun day with a breastfeeding support group - Description: a one-day session is done by reviewing previous workshops, giving a calendar to participants, and taking a testimonial video - Target: breastfeeding mothers (with infants from birth to six months) - Media: electronic posters, an exclusive breastfeeding calendar - Activities: socializing the roles of the breastfeeding support group, distributing calendars for checking the frequency of everyday breastfeeding, and taking videos of declaration support - Method: a home visit - Duration: two hours - Cost: IDR 750,000	Activity II Exclusive breastfeeding support group Session I (*Keping/Kelompok Pendamping I)* - Description: activities are conducted by forming, assisting, and socializing the exclusive breastfeeding volunteers - Targets: immunization volunteers, exclusive breastfeeding volunteers, village municipality - Media: guidebooks, modules, and pocketbooks about exclusive breastfeeding, letters of support from the Village Head (a form of commitment) - Activities: socializing the breastfeeding support group, forming a structure of exclusive breastfeeding volunteers, and writing letters of support for the breastfeeding support group program - Method: socialization and sharing

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Intervention Program	
Group A	**Group B**
	- Duration: two hours - Cost: IDR 109,750
Activity III Monitoring and Evaluation - Description: activities are done by monitoring an activity calendar (frequency of breastfeeding) and giving stickers as a reward - Target: breastfeeding mothers with babies from birth to six months old - Media: exclusive breastfeeding stickers - Activities: monitoring a weeklong checklist of breastfeeding frequency per day on a breastfeeding calendar, sharing challenges to breastfeeding, and giving appreciation stickers to families who have successfully implemented exclusive breastfeeding for a week - Method: home visit - Duration: two times a week for one week (two hours per meeting) - Cost: IDR 50,000	Activity III Exclusive breastfeeding support group Session II (*Keping/Kelompok Pendamping II)* - Description: an activity to monitor and evaluate with targeted volunteers and mothers by home visits - Targets: pregnant women in the second trimester and breastfeeding mothers with babies from birth to six months old - Media: exclusive breastfeeding guidebook - Activities: monitoring and controlling the frequency of breastfeeding and filling pocketbooks by breastfeeding support group volunteers - Method: home visit - Duration: three hours - Cost: IDR 380,300

Source: Field Work Report 2017/2018 (Group 14 and Group 15), Faculty of Public Health, Universitas Airlangga

Activity II in Group B was more concrete because it directly involved representatives from the village government. To show support and commitment to the program, the village head was present and signed a letter of agreement to recruit breastfeeding volunteers and to form the management structure. In Group I, the village government took part in the activities, providing more support compared to Group II activities that only involved the community.

The involvement of the village government showed that they understood the health challenges, for which the village government had responsibility along with the health workers. The Indonesia Government Regulation No. 33 of 2012 required village governments to implement a national policy on exclusive breastfeeding; carry out advocacy and socialization; provide technical training; and foster, monitor, evaluate, and supervise the implementation of exclusive breastfeeding programs in health service facilities, health education units, workplaces, public facilities, and the community. The village government carried out the duties of the district government at the village level.

Activity II in Group A only involved the primary targets (breastfeeding mothers) and secondary targets (their families). The breastfeeding support groups provided information to help the family motivate the mothers during the breastfeeding period.

Group B used more media for Activity II, such as a guidebook, module, and pocketbook for the breastfeeding support group volunteers, and a letter of agreement on forming the structure of a breastfeeding support group. Group A only used two media in Activity II: an e-poster and an

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.5-19

exclusive breastfeeding calendar. In comparison with Group A, Activity II by Group B was better prepared in consolidation with the village government, media, and human resources to form more structure for the breastfeeding support group volunteers. Nevertheless, the media used by Group A were more creative and interesting.

Fauziyyah (2018) conducted a study on the effectiveness of media to increase mothers' knowledge and attitudes towards complementary food in Kenep village, Sukoharjo District. Similarly, the findings of this study showed there was an increase in maternal knowledge after nutrition education carried out by distributing leaflets to 10.2%, pocketbooks to 10.3%, and videos to18%.

Suhertusi, Desmiwarti, and Nurjasmi (2015) found that respondents who watched health-promotion films had a higher average increase in personal knowledge than respondents who received leaflets (P = 0.001). Therefore, the success of information delivery is influenced by the right methods and media. Methods and media that convey interesting language will more positively affect message delivery. Creative health-promotion media can make abstract and difficult concepts more understandable (Suhertusi, Desmiwarti, and Nurjasmi, 2015).

Group B had breastfeeding support group volunteers and promotional materials to assist in breastfeeding practices. Breastfeeding support group volunteers helped health workers in the village and were expected to provide strong support to the mothers. The volunteers would plan, organize, implement, and control activities. In a similar way, the Muhammadiyah Klaten breastfeeding support group in 2015 provided care and conducted training for the supporters who could transmit awareness, commitment, willingness, knowledge, skills, and enthusiasm to community members (Sutaryono and Purwaningsih, 2015). An exclusive breastfeeding support group is an effective way to sustain breastfeeding.

Unlike Group B, which used two activities, Group A had three activities. Activity III of Group A was a follow-up to Activity II (monitoring and evaluation of the exclusive breastfeeding calendar). Activity III sought to discover whether a calendar helped mothers to increase the frequency of everyday breastfeeding, ideally every two hours or 8 to 12 times a day. Activity III was carried out for one week with the volunteers making two visits to the breastfeeding mothers' homes, usually on the third and sixth days. The initiators of the breastfeeding support group in Activity III put stickers on each door to reward the mothers who reached an ideal breastfeeding frequency in a day.

Group B monitored Activity III by looking at how breastfeeding mothers used the pocketbook. Breastfeeding reminders could make mothers more motivated to increase the frequency of breastfeeding for their babies. Research on professional breastfeeding support for first-time mothers states that early professional breastfeeding support, especially weekly telephone support, significantly increased the rates of exclusive breastfeeding in the early postnatal period and the overall duration of breastfeeding across the first six months (Fu *et al.*, 2014). Compared to standard support groups, 60% of participants receiving professional telephone support were more than twice as likely to breastfeed exclusively during the first month postpartum.

During the first six months, participants receiving professional telephone support were 20% less likely to stop breastfeeding compared to the standard support group (Fu *et al.*, 2014). Providing mothers with personal telephone-based peer support for breastfeeding during the first six months postpartum was an effective intervention to maintain

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.5-19

breastfeeding in the community (Forster *et al.*, 2019). This confirmed that continuous intervention could change behavior. Rayfield, Oakley, and Quigley (2015) found that breastfeeding support was more likely to be effective if it was proactive, delivered face-to-face, and provided on an on-going basis.

The results show that the intervention in Group B uses better informative media and better advance preparation compared with the intervention in Group A. Group A, however, made and used calendar media more effectively than other media.

Both programs evaluated the frequency of breastfeeding with a home-visit method and printed media as an everyday reminder. However, the duration of the intervention in each meeting was different. Once both groups had formed breastfeeding support group volunteers, the volunteers will assist and monitor breastfeeding frequency (Group B). While Group A only received a guidebook that contained myth-fact information about exclusive breastfeeding.

Program Success Analysis

Success can be measured in two ways: first, by setting goals or targets and then comparing the accomplished activity to the goal. A successful program can be evaluated by seeing how many indicators were achieved under the plan.

Table 3 shows that Group A has five indicators, while Group B has seven. The indicators show the program's success at ≥80%. When they were accumulated, the indicator success in Group A was 80% (four of five indicators were achieved), while in Group B, it was 85.71% (six of seven indicators were achieved). Thus, Group B has a higher indicator of success than Group A.

When analyzing the strengths and weaknesses of both programs, it can be recognized that Group A had more active participants, more creative media, and more innovative and interesting theoretical materials. However, the village government in Group A had poor communication with basic support group and lack of funding. Furthermore, they did not participate in improving exclusive breastfeeding behavior. Whereas, Group A analyzed general characteristics, the community only but not prospective volunteers. The intervention in Group A focuses on pregnant and breastfeeding women, not empowered volunteers.

Even though Group B had a lower budget for the program, they could managed it efficiently. They also used the budjet for forming a breastfeeding support group program. They also analyzed characteristics of prospective volunteers and addressed the intervention focusing on their readiness and skills. However, the Group B weaknesses included less attractive media and passive breastfeeding mothers' participation.

From the analysis of strengths and weaknesses, Group B received more material and physical support, such as human resources. Even commitment of breastfeeding support group in health care facilities, such as families, health workers, and the village government also supported the breastfeeding program in Group B.

The percentage of the success indicator in Group B was higher than in Group A; thus, the intervention in Group B was more effective. Group B used many resources: human resources, financial resources, and material resources. Human resources were an important component that influenced the effectiveness of community empowerment programs and alternatives for health probelms in both Groups A and B.

Community empowerment can improve the quality of human resources, especially in shaping and changing the behavior of the community to achieve a higher level of overall health. Thus, the policies and commitments are important

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and influence the interventions on many targets. The existence of policies can help facilitate an effective coordination system to change people's behavior.

Table 3. The Comparison of Program Success in Group A and Group B.

Program Success	
Group A	**Group B**
"Be Ready to Exclusively Breastfeeding Village Workshop" *(Workshop SIAP DESASI)* 1. Participants' attendance was 72% from the target of 50% (achieved). 2. The percentage of participants who achieved a high post-test score was 63% (not achieved). 3. Thirty percent of participants conducted questions and answers (reached).	Exclusive Breastfeeding Fun Sharing session (*Sharing sessionTALK SIK ASIEK*) 1.The attendance of participants in the program was 25%, under the target of 50% (not achieved) 2.The increasing attitude of participants towards exclusive breastfeeding was 18.75%, above the target of 15% (target achieved)
One Fun Day with breastfeeding support group Providing approval sheets and attaching exclusive breastfeeding family stickers reached >30% (achieved)	Exclusive breastfeeding support group Session I (*Keping/Kelompok Pendamping I)* 1. The membership and structure of the exclusive breastfeeding support group volunteers required at least ten volunteers (achieved) 2. Volunteers' knowledge and skills in assisting target mothers (pregnant women and mothers breastfeeding from birth to six months) increased by 10% (achieved) 3. Obtained commitment for an exclusive breastfeeding support group to facilitate all activities increased by 80% (target achieved) 4. A letter of support for the exclusive breastfeeding support group volunteers from the village head was issued (achieved) 5. Modules and pocketbooks for exclusive breastfeeding support group volunteers were compiled (achieved)
Monitoring and Evaluation The number of participants who wanted to be a part of the exclusive breastfeeding Family was >30% (achieved)	Exclusive breastfeeding support group Session II (*Keping/Kelompok Pendamping II)* None

Source: Field Work Report (Group 14 and 15) in the period of 2017/2018, Faculty of Public Health, Universitas Airlangga.

In implementing Activity II, Group A used an individual approach. Individual approaches require more energy to visit each target (breastfeeding mother), while Group B used a group approach and an individual approach (exclusive breastfeeding support group).

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CONCLUSION

The analysis of the community's characteristics in Sugihwaras (Group A) and Sumbergede villages (Group B) showed similarities in education level, occupation, and gender. Groups A and B were dominated by junior and senior high school graduates. Occupations in Groups A and B were primarily farmers, farmworkers, and employees of private companies.

The genders in both groups were balanced (50:50). Understanding a community's characteristics will help to prepare the planning of intervention programs.

Group A more frequently met the participants (4:3) when compared to Group B. The average duration of activities in both Groups A and B was roughly the same with a five-minute difference. The village government for Group B participated in forming a breastfeeding support group structure and fostering the volunteers. Therefore, Group B (Sumbergede) was better prepared to conduct the program than was Group A (Sugihwaras).

The percentage of achievement in Group B was 85.71%, which was 5.71% higher than Group A (80%); Group B had more success and resource power. The intervention program for Group B (Sumbergede) was more effective and had a higher potential to become a sustainable program in subsequent years.

The researchers hope that the intervention program in Group B can be an alternative solution for other regions with the same challenges. To achieve successful exclusive breastfeeding, resources, sustainable and continuous commitment and support from government, community, and colleagues are required.

ACKNOWLEDGMENT

This study was supported by a Field Work Project report from Group 14 and 15 2017/2018, Faculty of Public Health, Universitas Airlangga

CONFLICT OF INTEREST

The authors state that there is no conflict of interest in this article.

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.20-28

ORIGINAL RESEARCH

PHYSICIAN KNOWLEDGE AND RESPONSIBILITY OF PRESCRIPTION POLICY

Pengetahuan dan Tanggung Jawab Dokter Terhadap Kebijakan Peresepan Obat

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ABSTRACT

Background: The minimum standard of generic prescription drugs at a hospital is at 90%. However, the preliminary study discovered the use of generic drugs at Kalisat District Hospital, Jember from 2009 to 2011 was amounted to 57.50%, while the use of patent medicines was at 42.50%. This difference indicates unachieved standard of generic prescription drugs at the Hospital.
Aims: This study identified doctors' knowledge and responsibility of drug prescription policy at Kalisat District Hospital.
Methods: This descriptive and observational study employed a cross-sectional design. The data were collected randomly from 50 prescription documents of Kalisat District Hospital, Jember from April to July 2013. This study involved 6 general practitioners, 2 dentists, and 4 specialists.
Results: There was a strong correlation between doctors' specialization and responsibility for pescribing generic drugs. Doctors' knowledge about prescription policy of generic drugs was still lacking at 58.3%, while doctors' responsibility for prescribing generic drugs was satisfying.
Conclusion: Doctors at Kalisat District Hospital have an excellent sense of responsibility in prescribing generic drugs even though they have insufficient knowledge. The Hospital should conduct trainings, provide incentives, improve policies, monitor and evaluate generic prescriptions.

Keywords: generic drugs, prescription, doctors' responsibility, doctors' knowledge.

ABSTRAK

Latar Belakang: *Standar minimal peresepan obat generik di rumah sakit adalah sebesar 90%. Namun, penelitian pendahulu menunjukkan penggunaan obat generik di RSD Kalisat Jember pada tahun 2009-2011 sebesar 57,50% dan penggunaan obat paten sebesar 42,50%. Perbedaan ini menunjukkan belum tercapainya standar dari peresepan obat generik di rumah sakit.*
Tujuan: *Penelitian ini mengidentifikasi pengetahuan dan tanggung jawab dokter terhadap kebijakan penulisan resep obat generik di rumah sakit.*
Metode: *Penelitian ini merupakan penelitian deskriptif dan observasional serta menggunakan studi* cross-sectional*. Data dikumpulkan dari 50 dokumen resep RSD Kalisat Jember secara acak pada April-Juli 2013. Penelitian ini mengambil sampel 6 dokter umum, 2 dokter gigi dan 4 dokter spesialis.*
Hasil: *Ada hubungan yang kuat antara spesialisasi dokter dan tanggung jawab mereka dalam peresepan obat generik. Pengetahuan dokter terhadap kebijakan peresepan obat generik di rumah sakit masih kurang sebesar 58,3%, sedangkan tanggung jawab dokter terhadap peresepan obat generik sudah baik.*
Kesimpulan: *Dokter di RSD Kalisat Jember telah memiliki tanggung jawab yang baik terhadap peresepan obat generik walaupun mereka memiliki pengetahuan yang masih kurang. Rumah sakit diharapkan dapat mengadakan pelatihan, memberikan insentif, memperbaiki kebijakan, serta mengadakan monitoring dan evaluasi terhadap penulisan resep obat generik oleh dokter.*

Kata Kunci: *obat generik, peresepan obat, tanggung jawab dokter, pengetahuan dokter.*

Received: 5 November 2018 ***Accepted: 8 April 2019*** ***Published: 28 March 2020***

INTRODUCTION

Concerning Pharmaceutical Service Standard at hospitals, the Regulation of Indonesian Ministry of Health Number 72 of 2016 defines pharmaceutical care as a direct healthcare service for providing pharmaceutical service to ensure the quality of patients' life. Pharmaceutical care contributes to developing a vast and

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.20-28

well-coordinated pharmaceutical service for hospital units, including a diagnosis and therapy unit**,** nursing unit, medical staff unit, and so forth.

Pharmaceutical care has to be affordable for all social classes. The most significant component that affects medication cost is the availability of drugs, contributing 70% of the cost. Consequently, the Indonesian Government provides generic drugs with reasonable quality assurance, affordable prices, and high availability for patients. Drugs become an essential aspect of maintaining people's health and well-being. Most of the medical interventions use drugs, and thus the prominent availability of various drugs is necessary.

In spite of efficacy and good quality, drug prices have to be reasonably standardized for every social class. Generic drugs are one of the efforts made by the pharmacy care to provide drugs for all. According to the Regulation of Indonesian Ministry of Health Number 2 of 2010 concerning obligations to use generic drugs in healthcare facilities, generic drugs are medicine which its official name of International Non-Proprietary Names (INN) is appointed in Indonesian Pharmacopeia or other standard books about drug substances. Drugs must have an essential indication as a health logistic that is acceptable and has good quality to be safely consumed by the community. Generic drugs are drugs with good quality and affordable prices that can be obtained by all social classes.

Medicines are the most significant components of medical service cost in Indonesia. Even though the consumption level of drugs in Indonesia is relatively low, the cost is relatively high. Hence, the Government issued a policy to utilize generic drugs instead to maintain the welfare of medical service providers, especially owned by the Government. Increasing the use of generic drugs may further decrease costs of medicare beneficiaries and plans while also generating clinical benefits. For example, the cost savings generated by generic drug substitution have been attributed to an increase in medication adherence which may improve clinical outcomes (Hohmann *et al.*, 2018).

However, there are some doctors and patients that assume generic drugs as cheap and low-quality drugs. This matter is due to the fact that generic drugs are imitation (clone) of drugs that exceed their expiration date and are promoted using the name of active substances in branded drugs**.** Ferrerria et al. (2017) investigated the moderating roles of economic crisis in consumer behavior towards generic drugs by evaluating four correlations, such as (i) perceived quality, (ii) past consumption of generic drugs, (iii) recommendations of health care providers in relation to expenditure, and (iv) intention to purchase generic drugs. The results of the structural equation model show that in the economic crisis, consumers who prefer generic drugs have firm purchase intentions. Similarly, attitudes to expenditure is positively influenced by perceived quality and prior experience. Moreover, the probability of choosing generic drugs is generally higher for those who have attached more to their prior experience and perceived quality of generic drugs.

Deriving from the previous studies, to increase the utilization of generic drugs, some evaluations, along with proper education regarding generic drugs, are required for the community. According to the Regulation of the Indonesian Ministry of Health Number 2 of 2010, doctors assigned in healthcare facilities need to prescribe generic drugs for every patient based on the medical indication. Doctors are responsible for patients' safety, starting from a physical examination to prescription for patients. Moreover,

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.20-28

doctors have to obey prescription policy of generic drugs at hospitals.

Prescription policy of generic drugs is a legitimate authority, and thus there is no reason for someone to disobey. The Government has issued a policy regarding generic drug supplies at public hospitals. Based on the Regulation of the Indonesian Ministry of Health Number 2 of 2010 regarding obligations to use generic drugs in healthcare facilities, public healthcare providers are required to provide generic drugs for outpatients and inpatients in accordance to the formularies. Rising healthcare costs in an uncertain global economic situation can increase the use of generic drugs by the Government and buyers. Kaplan et al. (2012) revealed that price surveys in 36 Low and Middle-Income Countries (LMICs) showed that in the private sectorthe low cost of generic drugs is 2.6 times cheaper than the corresponding originator drugs. By using generic drugs, potential savings can be quite large. For example, in the private sector in 17 countries, the percentage of average savings for individual drugs (n=4-12 drugs) will range from 9% to 89% if buyers switch from the originator brands to the cheapest generic equivalents. However, savings will not be confirmed to the private sector (Kaplan *et al.*, 2012).

More frequent use of generic drugs, which many countries in the world apply is a crucial step to reduce prescription drug costs. The availability of generic drugs at public hospitals can minimize drug procurement costs which are usually expensive. Kotler et al. (2012) discovered that hospitals can increase profits by giving generic drugs to patients. In addition, generic drugs have good quality and are affordable for all social classes so that the Government is expected to expand the use of generic drugs, especially at public hospitals.

To enhance equitable drug distribution and affordable drug prices by wider community, the Government has launched the Generic Medication program. There are guidelines and supervision of generic drug use in public healthcare facilities as determined in the Decree of the Indonesian Ministry of Health Number 159 of 2010. These aim to ascertain and supervise hospitals to use appropriate generic drugs. The Decree of the Indonesian Ministry of Health Number 159 of 2010 also states that the formulary protocol can easily monitor and evaluate prescription for generic drugs at hospitals.

With an increase in drug prescription and rising drug costs, the use of generic drugs is on demands now (Howard *et al.*, 2018). Generic drugs are alternatives issued by the Government to suppress drug costs so that poor community can afford to buy drugs and take their rights. The researchers need to develop explanatory theories of drug policy formulation (Burris, 2017). Prescription policy of generic drugs ensures that healthcare providers can give the best service for patients, for instance providing appropriate drugs. The availability of excellent and affordable drugs is a must for every healthcare provider.

According to Krisnadewi, Subagio, and Wiratmo (2014), prescription is doctors' expertise of healthcare services that applies knowledge and skills both in apothecary and therapy which are done precisely, safely and rationally to patients and the entire community. In this case, generic prescription applies to public hospitals. Doctors working at public hospitals are required to comply with generic prescribing rules and standards amounting to 90% for districts and cities as determined by the Government. The Decree of the Indonesian Directorate General of Pharmaceutical and Medical Devices Number 02.03 of 2014 describes national formulary as a list of selected drugs required and provided in healthcare facilities which become guides for

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.20-28

executing National Health Insurance. Doctors are responsible for the formulary which prioritizes the utilization of generic drugs over patent drugs.

Doctors' responsibility is vital for the brand's safety. Furthermore, doctors as human resources are accountable for the quality and continuity of medical services at hospitals. Responsibility of generic prescription issued by the Government is obligatory not only for general practitioners but also for dentists and medical specialists. Generic drugs are alternatives distributed by the Government to reduce drug costs which are the most significant component of healthcare costs. This study aimed to identify doctors' knowledge and responsibility of generic prescription policy at Kalisat District Hospital.

METHOD

This study was a descriptive observational since it utilized questionnaires to collect data. This study employed a cross-sectional design in which data collection was conducted at one time at Kalisat District Hospital, Jember from April to July 2013. With a total sampling technique, there were 12 samples, including 6 general practitioners, 2 dentists, and 4 medical specialists, i.e., 1 neurologist, 1 gynecologist, 1 anesthesiologist, and 1 orthopedist.

The primary data were obtained from questionnaires developed with obedience theory by Sarwono (2009) and distributed to 12 functional doctors at Kalisat District Hospital. In addition, the data were randomly taken from 50 prescription documents out of 4014 documents from Medical Record Unit.

Meanwhile, hospital profiles and annual hospital reports were used to collect the secondary data. The variables observed include doctors' characteristics (gender, age, knowledge, and specialization), doctors' knowledge, and doctors' responsibility for prescribing generic drugs at the Hospital. The data were analyzed descriptively with frequency distribution, percentage of doctors' characteristics, doctors' comprehension, and doctors' responsibility for generic prescriptions.

RESULTS AND DISCUSSION

Respondents' Characteristics

Respondents' characteristics are some factors that affect the final results of the study. Respondents' characteristics involve gender, age, and specialization. In terms of gender, 8 doctors (66.7%) are male, and 33.3% of the doctors are female. Based on age, there are 6 doctors (50%) which are under or 40 years old, and 50% of them are over 40 years old. According to specialization, 50% of the respondents are general practitioners, 16.7% of them are dentists, and 33.3% are specialists. It was found that destists completely implement generic prescription policy. Pearson Chi-Square score was obtained 4.875 with p=0.087 and r=0.637. It means there is a strong correlation between doctors' specialization and their responsibility for generic prescriptions. Dentists tend to prescribe more generic drugs than specialists and general practitioners.

Doctors' Knowledge of Generic Prescription Policy

Doctors' knowledge of generic prescription policy can be seen from their awareness of prescribing drugs under the formulary and the policy. This present study on doctors' knowledge of prescription indicated that the doctors understood prescription requirements according to the generic and patent formulary. However, the doctors were unaware of prescribing generic drugs. Doctors' knowledge was rated from 1 to 4. Rate 4 is for knowledgeable doctors, Rate

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.20-28

3 is for decently informed doctors, and Rate less than 3 is assigned to less informed doctors. The data provide information that 7 doctors were still uninformed about prescription policy.

People obey because they understand regulations and compulsions. In addition, prescription policy is a legitimate and binding authority. Thus, there is no reason for doctors to not comply with the policy. Knowledge of prescription policy matters for the doctors in any healthcare providers since it can rapidly optimize the use of generic drugs. Doctors' knowledge of prescription policy based on specialty category can be seen in Table 1.

Medical specialists were more informed about prescription policy than general practitioners and dentists. Most of the general practitioners and dentists were uninformed about the use of generic drugs and the standard of prescribing generic drugs. A study in Perak, Malaysia found an effective educational intervention for doctors to improve the rate of generic prescription. This study pointed out that by inviting doctors to an interactive lecture and giving them an educational booklet and a drug list, they could manage to improve their knowledge of generic drugs (Hassali *et al.*, 2014). Consequently, trainings for for general practitioners and dentists can be more intensive since patients will seek treatments from general practitioners and dentists before going to medical specialists.

Doctors' comprehension of generic prescription at Kalisat District Hospital was still lacking due to the fact that Kalisat District Hospital did not enforce generic prescriptions to all patients. Only patients with public insurance are required to receive generic drugs because the formulary comes from the List of National Essential Drugs (DOEN). Furthermore, there is no standard of generic prescription applied at the Hospital. Thus, the doctors are more unaware of standard hospital prescription.

Positive attitude towards the importance of health information for patients is a significant predictor for improving patients' comprehension. Medical providers, who believe health information delivery important, can be more open in learning about information delivery and approaches to support patients' comprehension of health information. Providing generic drug information becomes doctors' responsibilities to ensure patients' welfares. Toverud, Hartmann and Ha˚konsen (2015) highlighted that generic drugs are believed as a tool for better equity and access to drugs. By this means, it is assumed that patients can obtain their welfare as proper as possible. Moreover, doctors' comprehension in prescribing generic drugs need to improve according to pharmaceutical service standards as determined by the Government.

Doctors' Responsibility for Generic Prescription Policy

To prescribe drugs, doctors are responsible for following the formulary and generic prescription policy to patients. Table 2 explains doctors' responsibility for prescribing drugs at the Hospital. Excellent responsibility is scored 12-16, and decent responsibilityis scored 7-11. While, deficient responsibility has less than 7 scores. The results show that doctors' responsibility is good, meaning that they bear moral dimensions under patients' welfare. Table 3 illustrates doctors' responsibility based on specialty category.

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Table 1. Doctors' Knowledge about Prescription Policy at Kalisat District Hospital Based on Specialties.

Policy Comprehension		General Practitioners		Dentists		Medical Specialists		Total	
		n	%	n	%	n	%	n	%
Guided by Generic Formulary	Aware	4	66.7	2	100	4	100	10	83.3
	Unaware	2	33.3	0	0	0	0	2	16.7
Guided by Supporting Formulary	Aware	5	83.3	2	100	4	100	11	91.7
	Unaware	1	16.7	0	0	0	0	1	8.3
Generic Drug Usage	Aware	1	16.7	0	0	3	75	4	33.3
	Unaware	5	83.3	2	100	1	25	8	66.7
Standard of Generic Prescription	Aware	2	33.3	0	0	2	50	4	33.3
	Unaware	4	66.7	2	100	2	50	8	66.7

Table 2. Distribution of Doctors' Responsibility for Prescription Policy at Kalisat District Hospital.

The Doctors' Responsibility for Generic Drug Prescribing Policy	Never		Rare		Often		Always		Total	
	n	%	n	%	n	%	n	%	n	%
Using Formulary Guide for Prescribing Drugs	0	0	0	0	6	50	6	50	12	100
Using Generic Formulary Guide more than Supporting Formulary	1	8.3	0	0	8	66.7	3	25	12	100
Prescribing Generic Drugs	0	0	0	0	9	75	3	25	12	100
Offering Generic Drugs before Distributing to Patients	1	8.3	2	16.7	7	58.3	2	16.7	12	100

In Table 3, general practitioners, dentists and medical specialists have a great responsibility for implementing generic prescription policy. Responsibility is a self-actualization to achieve a goal. As doctors need to be responsible for patients' prescription, they need to adhere to the formulary which is more frequently used than supporting formularies and generic drugs. The doctors at Kalisat District Hospital were mostly well-informed and responsible for prescribing generic drugs according to given formulary. Their obedience to generic drugs attributes hospital rules which only gives generic drugs to patients with public insurances to maximize profits. Kalisat District Hospital only prescribed patent medicines for general patients. Disobedience to the formulary will affect the service quality at the Hospital, especially in the Pharmacy Unit (Krisnadewi, Subagio, and Wiratmo,

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2014). Doctors' responsibility is not limited to prescribe generic drugs based on the formulary, but it also screens prescriptions accuracy as patients need.

Table 3. Doctors' Responsibility for Generic Prescription at Kalisat Public Hospital Based on Specialty in July 2013.

Responsibility for Prescription		General Practitioners		Dentists		Medical Specialists	
		n	%	n	%	n	%
Using Formulary Guide for Prescribing Drugs	Aware	3	50	2	100	1	25
	Unaware	3	50	0	0	3	75
	Lacking	0	0	0	0	0	0
Using Generic Formulary Guide more than Supporting Formulary (Brand Drugs)	Aware	0	0	1	50	2	50
	Unaware	6	100	0	0	2	50
	Lacking	0	0	1	50	0	0
Prescribing Generic Drugs	Aware	0	0	1	50	2	50
	Unaware	6	100	1	50	2	50
	Lacking	0	0	0	0	0	0
Offering Generic Drugs before Distributing to Patients	Aware	0	0	1	50	1	25
	Unaware	4	66.7	1	50	2	50
	Lacking	2	33.3	0	0	1	25

Irrational prescription can cause excessive waste and resistance to certain antibiotics if patients suffer from diseases caused by bacteria. Moreover, excessive drug utilization can cause disease complications. Rational and logical prescription can save medicine costs and avoid other diseases arising from doctors' mistakes and irrationality in prescribing drugs. Rational prescription according to Maxwell (2016) may be a great influence on cost-effectiveness, for example prescribing generic drugs instead of branded drug from the same class. This considers the limited resources in healthcare providers. It can also improve community health and thus concurrently increase the level of productivity.

Furthermore, doctors must ensure that they play a role in medication. Doctors who are not competent in prescription may cause malpractice. Types of drugs and the level of risks associated also affect non-medical health workers' responsibility for prescription. Medicines will be considered highly risky if they potentially cause severe side effects or serious interactions with other drugs for high doses (Maddox *et al.*, 2016). High-dose drugs can be dangerous for the patients so that not only doctors but also pharmacists need to properly prescribe drugs.

Beside doctors and other health workers, pharmaceutical staffs can be monitored through a Prescription Drug Monitoring Program (PDMP). In Washington, periodic research on the Prescription Drug Monitoring Program was conducted to observe registration for emergency medicine providers and other health workers. The results indicated that drug providers or healthcare service providers are instructed to register into PDMP rather than use it as a way to observe prescription practices.

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Nevertheless, several policies aim to reduce overdose opioid prescription (Sun *et al.*, 2018). The results prove the effectiveness of registration madate and suggest potential approaches to increase PDMP that are consistent with experts' recommendations. First, registration to PDMP is required for all prescriptions (Greenwood-ericksen *et al.*, 2016). Second, policymakers must consider PDMP as a mandatory before prescribing opioids. Third, logistical barriers in the use of PDMP must be minimized (Poon *et al.*, 2016). A potential solution is to automate requests for PDMP and integrate data into existing Electronic Medical Record (EMR).

Prescription in Indonesia can be performed using Information and Management System. This system is developed by hospitals and the Government to provide convenient pharmaceutical care for patients. It can be used to monitor prescription practices which can be done quickly and taken back in case there are prescription errors.

CONCLUSION

This study draws some conclusions in terms of doctors' characteristics, knowledge, and responsibility for generic prescriptions. Firstly, doctors' specializations have a strong correlation with their responsibility for generic prescriptions. There are 58.3% doctors whose comprehension of generic prescription policy is lacking. Meanwhile, all dentists and medical specialists are more knowledgeable about the policy. In addition, 66.7% of general practitioners are less aware of the policy. In terms of responsibility, the doctors at Kalisat District Hospital have a very good responsibility of prescribing generic drugs.

Increasing the doctors' awareness and responsibility for generic prescription can be accomplished by implementing the standards issued by the Government. Training about hospital policy, proper monitoring, and evaluation can be carried out to observe whether doctors have improved their knowledge and responsibility of prescribing generic drugs. In addition, Kalisat District Hospital can give incentives to increase doctors' responsibility of prescribing generic drugs.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest for this article.

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.20-28

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

ORIGINAL RESEARCH

DISTRIBUTION ANALYSIS OF DOCTORS IN INDONESIA

Analisis Distribusi Tenaga Dokter di Indonesia

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ABSTRACT

Background: The distribution of health workers in Indonesia raises an interesting discussion since Indonesia, as an archipelagic country, faces various challenges, including a wide geographical area, in fulfilling equitable health services.
Aim: This study identifies factors related to the distribution of doctors in Indonesian provinces.
Methods: An advanced analysis of the secondary data was performed according to the "Data and Information: Indonesian Health Profile in 2017." The units that were analyzed in this study represented the 34 provinces of Indonesia. The variables that were assessed denoted the population, specifically the density and percentage of the poor population, as well as the number of doctors, hospitals, and primary healthcare centers.
Results: The variability regarding the number of doctors was significant. A higher population increased the attraction for doctors to practice in the provinces. Furthermore, the study revealed the tendency of doctors to elect to work in provinces with more hospitals and primary healthcare centers.
Conclusions: Of the five independent variables studied, four were related to the number of doctors distributed in the provinces. Population, density, the number of hospitals, and the number of primary healthcare centers were positively related to the number of doctors. The results of this study were pertinent to the policy regarding the redistribution of doctors in Indonesia.

Keywords: distribution analysis, doctor distribution, health resources management, health workers.

ABSTRAK

Latar Belakang: *Distribusi tenaga kesehatan menjadi kajian penting di Indonesia yang memiliki rentang geografis yang luas, dan tantangan sebagai negara kepulauan bagi terpenuhinya pelayanan kesehatan yang adil dan merata untuk seluruh masyarakat tanpa kecuali.*
Tujuan: *Penelitian dilakukan untuk menjawab faktor-faktor yang berkaitan dengan distribusi tenaga dokter berdasarkan provinsi di Indonesia.*
Metode: *Analisis lanjut data sekunder dari "Data dan Informasi: Profil Kesehatan Indonesia tahun 2017". Unit analisis dalam studi ini adalah provinsi, seluruh 34 provinsi di Indonesia dianalisis. Variabel yang dianalisis adalah jumlah tenaga dokter, jumlah penduduk, densitas, persentase penduduk miskin, jumlah rumah sakit, dan jumlah Puskesmas.*
Hasil: *Variabilitas ketersediaan tenaga dokter yang sangat lebar. Semakin banyak jumlah penduduk, semakin menarik bagi para tenaga dokter untuk berpraktik di provinsi tersebut. Ditemukan juga bahwa dokter cenderung memilih untuk bekerja di provinsi yang memiliki lebih banyak rumah sakit dan puskesmas.*
Kesimpulan: *Dari lima variabel independen yang diteliti, ada empat variabel yang terkait dengan jumlah dokter. Variabel jumlah penduduk, densitas penduduk, jumlah rumah sakit, dan jumlah Puskesmas berhubungan secara positif dengan jumlah tenaga dokter. Hasil penelitian ini dinilai penting sebagai dasar kebijakan untuk melakukan redistribusi tenaga dokter di Indonesia.*

Kata kunci: *analisis distribusi, distribusi tenaga dokter, manajemen sumberdaya kesehatan, tenaga kesehatan.*

Received: 31 May 2019 ***Accepted: 19 August 2019*** ***Published: 28 March 2020***

INTRODUCTION

The distribution of health workers in Indonesia is prominent to discuss since Indonesia as an archipelagic country has a broad geography in providing equal health services for all communities The Indonesian government aims to improve

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

the health status in all regions of the country, ensuring equal access to health services by citizens from remote parts, peripheral areas, borders, and islands (Suharmiati, Laksono, and Astuti, 2013; Senewe and Elsi, 2014; Soewondo *et al.*, 2019).

The National Long-Term Development Plan (RPJP-N) 2005-2025 focuses on health and how to achieve good quality and competence of human resources and improve the Indonesian Human Development Index. Moreover, the government directs the national development of the health sector to increase awareness, willingness, and the ability of everyone to lead a healthy lifestyle, allowing the health status of all citizens to improve. Health workers, including doctors, are key players in achieving the health development goals since they are responsible for up to 80% of the increase on this front (Tangcharoensathien, Mills and Palu, 2015).

The governments of various countries are currently involved in efforts to achieve health equality, especially for people who are considered vulnerable and disadvantaged. The most significant challenge is ensuring that peripheral, backward, and remote areas also have access to qualified health services, competent health workers, and adequate healthcare facilities. The distribution of doctors in Indonesia presents problems in providing equal rights to every citizen. Equality is defined as no difference between groups of people in terms of social, economic, demographic, or geographical factors (Bambra, 2016).

Health inequality, especially the unfair availability of doctors, involves health determinants, such as community access to healthcare facilities. Furthermore, it is related to the government's failure to overcome inequality, evidenced by the violation of justice and human rights (Fu *et al.*, 2018; Tayyari Dehbarez *et al.*, 2018). The unequal distribution and geographical imbalance add to the challenges. Distributing and placing an adequate number of quality health workers in disadvantaged areas significantly increases the level of equal health services. Indonesia still displays a substantial disparity between urban and rural areas (Wulandari and Laksono, 2019), as well as between the respective regions, districts, and provinces in the country (Laksono, Wulandari, and Soedirham, 2019). Data from the Board for Development and Empowerment of Human Resources in Public Health in 2019 explained that the distribution of health workers can be derived from the ratio of doctors in parts of Jakarta Province with 65 doctors per 100,000 people, while West Java and Banten have 11 doctors per 100,000 citizens. Disparities are also found in West Sulawesi Province with 12 doctors per 100,000 people, while Maluku and East Nusa Tenggara Province have 14 doctors for the same number of citizens.

The distribution ratio of doctors to the number of people is affected by geographical and demographic problems. Furthermore, access to basic health services requires more attention in terms of geography. Sufficient actions and policies are required to deal with the challenges presented by doctor distribution, especially in the era of National Health Insurance (Karan *et al.*, 2019). Therefore, this study aims to identify factors related to the distribution of doctors in Indonesian provinces, which can provide suggestions for those involved in the policy-making of health worker distribution.

METHODS

This study represented an analysis of secondary data from the "Data and Information: Indonesian Health Profile 2017" issued by the Health Data and

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

Information Center, Indonesian Ministry of Health (Indonesian Ministry of Health, 2018). The profile book was provided on www.pusdatin.kemkes.go.id, while the analysis involved 34 Indonesian provinces.

The dependent variable was designated as "Number of Doctors." The number of doctors included general and specialist physicians practicing in certain provinces. An additional five variables were assessed, namely population, density, the percentage of poor people, the number of hospitals, and the number of primary healthcare centers. These variables were each categorized into five statistical distribution strata. The cross-tabulation of the individual variables with that of the "Number of Doctors" simplified the analysis of doctor distribution.

RESULTS AND DISCUSSION

Figure 1 shows the distribution of the available number of doctors per province in Indonesia, which appears to be more extensive on Java Island. Additionally, more doctors seem to be available in Western Indonesia than in Eastern Indonesia.

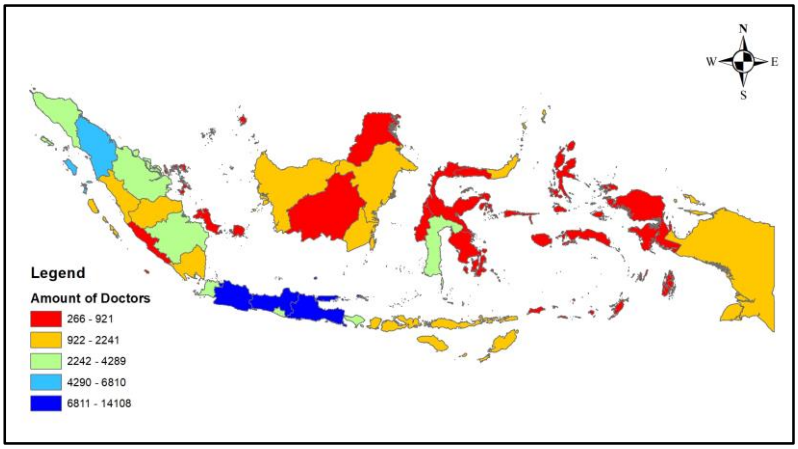

Figure 1. Distribution of the Number of Doctors based in Provinces in Indonesia in 2017.

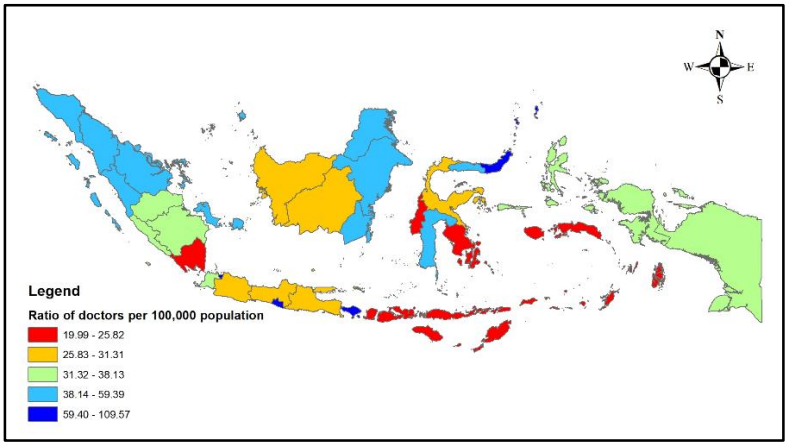

Figure 2. Distribution of the Doctor Ratio per 100,000 People, based on Provinces in Indonesia in 2017.

Figure 2, which maps the ratio of doctors per 100,000 people, shows different conditions. Some provinces in Java Island exhibit a lower ratio.

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Table 1 shows extensive variability in the number of physicians. The highest number of doctors is evident in West Java Province, with as many as 14,108, while West Sulawesi Province has the least number of physicians at 266.

Table 2 indicates that doctors tend to gather in provinces with large populations. It also explains that there is an increase in the number of doctors in conjunction with a rise in the population of each province, as illustrated in Figure 1. Provinces in Eastern Indonesia have fewer doctors than Java and Sumatra.

Table 1. Descriptive Statistics of the Number of Doctors and Other Related Variables.

Variables	N	Min	Max	Mean	Std Deviation
Number of doctors	34	266	14108	2932.44	3632.620
Number of Populations	34	691,058	48037,827	7,702,672.71	11,003,254.853
Percentage of Poor Population	34	3.78%	27.76%	10.95%	0.0578730
Population Density	34	9.16	15,623.61	727.1847	2,661.62002
Number of hospitals	34	10	393	81.65	96.411
Number of primary healthcare centers	34	49	1056	288.97	243.159

Table 2. Cross Tabulation of the Number of Doctors and Population in Indonesia 2017.

Number of Populations	Number of Doctors					Total
	< 637	637 - 1,125	1,126 - 2,059	2,060 - 3,708	> 3,708	
< 1,744,654	7	0	0	0	0	7
	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1,744,654 - 3,265,202	0	6	1	0	0	7
	0.0%	85.7%	14.3%	0.0%	0.0%	100.0%
3,265,203 - 4,955,578	0	0	5	2	0	7
	0.0%	0.0%	71.4%	28.6%	0.0%	100.0%
4,955,579 - 8,690,294	0	1	1	5	0	7
	0.0%	14.3%	14.3%	71.4%	0.0%	100.0%
> 8,690,294	0	0	0	0	6	6
	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%

A cross-tabulation between the number of doctors and the population in all provinces shows that the category denoting a meager population (<1,744,654 people) contained very few doctors (< 637 doctors). Whereas, the category signifying an exceedingly large population (>8,690,294 people) presented a substantial number of doctors (>3,708 doctors). This means that the number of doctors is positively related to the population of a province. Therefore, the higher the population of a province, the higher the interest of doctors in working there.

The number of doctors was cross-tabulated with the density or population density in each province, as seen in Table 3. The category denoting the non-dense population (<37.19 people per kilometer) was dominated by a low number of doctors (<637 doctors). However, an exceedingly high number of doctors (>3,708 doctors) resided in areas that were densely populated (>734.69 people per kilometer).

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Consequently, the number of doctors is positively associated with the population density in a province. In other words, doctors are more interested in conducting practices in densely populated regions.

The results regarding the cross-tabulation of the number of doctors and the percentage of poor people exhibited the same trend. A low percentage of poor people (<6.08% poor people) corresponded with a low number of doctors (<637 doctors). Contrarily, an extremely high percentage of poor people (>15.58% poor people) were dominated by an exceedingly large number of doctors (>3,708 doctors). However, different trends were evident in other categories. For instance, a medium percentage of poor people was associated with a large number of doctors, while a medium number of doctors worked in provinces with a large percentage of poor people.

Regarding the number of hospitals in all provinces, very few doctors (<637 doctors) worked in provinces that did not have many hospitals (<22 hospitals). Conversely, a large number of hospitals (>100 hospitals) tended to attract many doctors (>3,708 doctors). Therefore, these results indicate that the number of doctors is positively related to the number of hospitals in a province. Provinces with a larger number of hospitals will have more doctors.

Table 3. Cross Tabulation of the Number of Doctors and Population Density per Kilometer in Indonesia 2017.

Density	Number of Doctors					Total
	< 637	637 - 1,125	1,126 - 2,059	2,060 - 3,708	> 3,708	
<37.19	3	2	2	0	0	7
	42.9%	28.6%	28.6%	0.0%	0.0%	100.0%
37.19 - 87.12	3	2	1	1	0	7
	42.9%	28.6%	14.3%	14.3%	0.0%	100.0%
87.13 - 126.66	1	2	1	3	0	7
	14.3%	28.6%	14.3%	42.9%	0.0%	100.0%
126.67 - 734.69	0	1	3	2	1	7
	0.0%	14.3%	42.9%	28.6%	14.3%	100.0%
>734.69	0	0	0	1	5	6
	0.0%	0.0%	0.0%	16.7%	83.3%	100.0%

The previous results are also indicative of the relationship between the number of doctors and the number of primary healthcare centers. Provinces with very few primary healthcare centers (<121 primary healthcare centers) were dominated by a low number of doctors (< 637 doctors). Therefore, a large number of doctors (> 3,708 doctors) tended to conduct practices in provinces with a large number of primary healthcare centers (>372 primary healthcare centers), indicating that the number of primary healthcare centers exhibited a linear relationship with the number of doctors.

However, Table 6 shows a very few number of primary healthcare centers have a medium number of doctors. This may be attributed to various factors affecting the distribution of physicians and requires further research.

The distribution of doctors among provinces showed extensive variability. West Sulawesi Province had 266 doctors, while this number reached 14,108 in West Java Province. The results also showed

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Doi: 10.20473/jaki.v8i1.2020.29-39

that the number of doctors was positively related to population, density, the number of hospitals, and the number of primary healthcare centers. This situation was the result of health service policies issued by the government. For example, until 2014, the policy involving primary healthcare centers stipulated a standard ratio of a primary healthcare center per 30,000 residents. Due to the progressive development of primary healthcare centers in 2014, the ratio per resident was changed to per district. This policy is still currently valid. Although the quota of doctors in Indonesia has been exceeded, more than 700 primary healthcare centers lack doctors. This is due to the unequal distribution of human resources, which often dominates Java-Bali (Indonesian Ministry of Health, 2019).

Table 4. Cross Tabulation Number of Doctors and Percentage of Poor Population in Indonesia in 2017.

Percentage of Poor Populations	Number of Doctors					Total
	< 637	637 - 1,125	1,126 - 2,059	2,060 - 3,708	> 3,708	
<6.08%	3	2	2	0	0	7
	42.9%	28.6%	28.6%	0.0%	0.0%	100.0%
6.08% - 7.86%	3	2	1	1	0	7
	42.9%	28.6%	14.3%	14.3%	0.0%	100.0%
7.87% - 11.97%	1	2	1	3	0	7
	14.3%	28.6%	14.3%	42.9%	0.0%	100.0%
11.98% - 15.58%	0	1	3	2	1	7
	0.0%	14.3%	42.9%	28.6%	14.3%	100.0%
>15.58%	0	0	0	1	5	6
	0.0%	0.0%	0.0%	16.7%	83.3%	100.0%

Table 5. Cross Tabulation of the Number of Doctors and Number of Hospitals in Indonesia in 2017.

Number of Hospitals	Number of Doctors					Total
	< 637	637 - 1,125	1,126 - 2,059	2,060 - 3,708	> 3,708	
< 22	6	2	0	0	0	8
	75.0%	25.0%	0.0%	0.0%	0.0%	100.0%
22 - 35	1	3	2	0	0	6
	16.7%	50.0%	33.3%	0.0%	0.0%	100.0%
36 - 63	0	2	4	1	0	7
	0.0%	28.6%	57.1%	14.3%	0.0%	100.0%
64 - 100	0	0	1	6	0	7
	0.0%	0.0%	14.3%	85.7%	0.0%	100.0%
> 100	0	0	0	0	6	6
	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

Table 6. Cross Tabulation of the Number of Doctors and Number of Primary Healthcare Centers in Indonesia in 2017.

Number of Primary Healthcare Centers	Number of Doctors					Total
	< 637	637 - 1,125	1,126 - 2,059	2,060 - 3,708	> 3,708	
<121	4	1	0	2	0	7
	57.1%	14.3%	0.0%	28.6%	0.0%	100.0%
121 - 189	2	1	4	0	0	7
	28.6%	14.3%	57.1%	0.0%	0.0%	100.0%
190 - 241	1	2	2	1	1	7
	14.3%	28.6%	28.6%	14.3%	14.3%	100.0%
242 - 372	0	2	1	3	1	7
	0.0%	28.6%	14.3%	42.9%	14.3%	100.0%
>372	0	1	0	1	4	6
	0.0%	16.7%	0.0%	16.7%	66.7%	100.0%

The Regulation of the Indonesian Ministry of Health No. 75 of 2014 regulates the minimum number of health workers, including doctors, that must be available in each primary healthcare center. This policy calculates the number of health workers based on an analysis of the staff workload, types of health services provided, population size and distribution, working areas, characteristics of the working areas, availability of other healthcare facilities in the working areas, and the division of work duration (Dharmayuda, Wulandari, and Wirawan, 2015; Anorital, Muljati, and Andayasari, 2016; Marlinda, 2017; Hidayanti, 2018).

This regulation also forms the basis for the issuance of other policies, such as the Regulation of the Indonesian Ministry of Health No. 33 of 2018 concerning the Healthy Nation Program or *Nusantara Sehat*. The Healthy Nation Program was initiated to meet the needs of several primary healthcare centers in disadvantaged areas, borders, and islands, where the number of health workers is not in accordance with the standard (Simanjuntak, Kusmanto, and Suriadi, 2018). This policy became an alternative to distributing doctors and other health workers in peripheral areas that were rarely of interest to these professionals. Doctors can be distributed in two ways, namely as part of a team-based mechanism in conjunction with other health workers, or an individual mechanism, in accordance with the Non-Permanent Employee Program.

In addition, the government pays specific attention to disadvantaged areas, borders, and islands, for whom separate policies are created. This refers to the establishment of mobile hospitals, border hospitals, temporary doctors, and water services, as well as financing policies for health (Pratiwi *et al.*, 2014; Misnaniarti *et al.*, 2017; Prawiroharjo, Pratama and Librianty, 2019). However, additional support structures are required for the redistribution of doctors in Indonesia.

In addition to the macro variables that were examined, several regional conditions attracted doctors, such as regional fiscal capacity, original regional income, regional gross domestic income, economic growth, and the percentage of the budget reserved for the health sector (Wahab, Husein, and Al-Hadithi, 2016; Thomson, 2019; McIsaac, Scott and Kalb, 2019). Research conducted in Blitar District suggested an incentive mechanism for doctors by considering the

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

difficulty levels of regions, topography, availability of transportation, facilities, and infrastructure. Recommendations were then formulated via discussions with doctors, heads of primary healthcare centers, regional hospitals, District Health Offices, members of the Regional House of People's Representatives, the Regional Personnel Agency, and the Agency for Regional Development (Laksono, Pudjirahardjo, and Mulyono, 2012).

The findings of this study corresponded with the latest research findings in India (Singh, 2019; Karan *et al.*, 2019) and China (Zhu, Hsieh, and Mao, 2019). Results showed that the distribution of physicians was influenced by the population, as well as the population density of a particular area. Disparities in the distribution of physicians in India and China were in line with an increase in the Gini index (Singh, 2019; Yang, Yin and Wang, 2019; Wu and Yang, 2019).

A slight deviation from the present findings indicated that doctors in Lebanon were less interested in primary healthcare services and preferred to work independently in urban areas. At least five main issues contributed to doctors' disinterest in primary healthcare services. These included a minimal understanding of concepts, a diminutive scope of work in primary healthcare services, issues with recruitment, problems with low doctor retention, challenges in remote and retarded areas, and a lack of policymakers' roles during post-distribution (Alameddine *et al.*, 2016). Doctor retention, especially in primary healthcare centers, is low due to low income. The capitation system used as the basis for the payment of medical services does not apply to doctors who work in remote areas, specifically due to diffusion. In addition, doctors face difficult working environments and do not receive social life guarantees (Bertone, Lurton, and Mutombo, 2016; Honda *et al.*, 2019; Mashange *et al.*, 2019).

The reluctance of doctors to work in rural and remote areas far from cities is a challenge. Thus, access to health services in urban areas far exceeds that in rural areas (Kenea and Jisha, 2017; Wen *et al.*, 2017; Gonzales *et al.*, 2017; Li *et al.*, 2018). The Eastern Indonesian regions, which are dominated by rural areas, inadequate facilities, and low population density, become barriers for doctors and other health workers (Nantabah, Agustina and Laksono, 2019).

This study provided limited macro policy recommendations because it used aggregate data at the provincial level. Further research is still required to determine the influencing factors at the individual level from doctors as implementers and communities as policy targets. Furthermore, future research can be used as a basis for more detailed policy decisions at the micro level.

CONCLUSION

To conclude, of the five independent variables studied, four were related to the number of doctors. Population size, density or population density, the number of hospitals, and the number of primary healthcare centers are positively related to the number of doctors. The government needs to issue a policy for the redistribution of physicians in Indonesia. Doctor retention in disadvantaged regions can be maintained by giving doctors rewards, both material and non-material. For example, the government can guarantee easy enrolment to specialist schools for doctors serving in these regions.

ACKNOWLEDGMENTS

The author would like to thank the Center for Data and Information, and the Indonesia Ministry of Health, which provided data on the Indonesian Health

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

Profile in 2017, forming the basis for the analysis in this study.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest in this article.

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.29-39

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JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.40-55

LITERATURE REVIEW

LITERATURE REVIEW: THE IMPLEMENTATION OF E-HEALTH AT PRIMARY HEALTHCARE CENTERS IN SURABAYA CITY

Tinjaun Pustaka: Implementasi E-Health di Puskesmas di Kota Surabaya

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ABSTRACT

Background: The increasing number of patient visits in primary healthcare centers in Surabaya causes long duration of queue in a registration counter. To solve this problem, Surabaya Government has created an online registration system in each health service provider. The e-health is expected to give a positive impact on reducing the queue traffic at the registration counter.
Aim: This study identified whether the online registration system or e-health which has been implemented by primary healthcare centers in Surabaya City is successful or not.
Method: This study was a literature review which collected articles from Google Scholar databases published from 2015 until 2019. Fourteen articles were collected, but only 6 articles were discussed because of their relevant topics.
Results: The review shows that e-health can simplify the process of patient registration and reduce patients' waiting time for health service delivery. The success indicators of e-health program include its well-established system, effective information system, and excellent service for community. Obstacles found in the e-health implementation involve lack of thorough socialization of e-health. In turn, the community prefers a manual registration to e-health.
Conclusion: The e-health service in primary healthcare centers in Surabaya City gives a positive effect on giving a fast and easy process in the registration procedure. However, there are still obstacles in implementing e-health due to lack of socialization.

Keywords : queue, e-health, queuing time, primary healthcare centers.

ABSTRAK

Latar Belakang*: Peningkatan jumlah kunjungan pasien yang memanfaatkan pelayanan kesehatan di Puskesmas Kota Surabaya mengakibatkan antrean panjang di loket pendaftaran. Oleh karena itu, Kota Surabaya menciptakan sistem pendaftaran online di Puskesmas dengan harapan bahwa e-health akan memberikan dampak positif pada penurunan volume antrean di loket pendaftaran.*
Tujuan*: Studi ini bertujuan untuk mengetahui seberapa besar keberhasilan sistem pendaftaran online atau e-health yang sudah diterapkan di Puskesmas Kota Surabaya.*
Metode*: Studi ini merupakan literature review. Artikel diambil dari database Google Scholar yang dipublikasikan pada tahun 2015 sampai 2019. Artikel yang diperoleh sebanyak 14 artikel, tetapi hanya 6 artikel memiliki topik yang relevan.*
Hasil*: Hasil tinjauan pustaka ini menunjukkan bahwa e-health dapat mempermudah proses pendaftaran pasien dan mengurangi waktu tunggu pasien untuk mendapatkan pelayanan. Indikator keberhasilan program e-health meliputi sistem yang baik, sistem informasi yang efektif, dan pelayanan prima bagi masyarakat. Kendala yang ditemukan dalam penerapan e-health adalah sosialisasi yang tidak merata. Akibatnya, masyarakat lebih memilih menggunakan registrasi manual daripada e-health.*
Kesimpulan*: Adanya layanan e-health di Puskesmas Kota Surabaya dapat memberikan dampak positif dalam mempermudah dan mempercepat proses pelayanan di Puskesmas. Namun, masih terdapat kendala dalam penerapan e-health yang disebabkan oleh kurangnya sosialisasi.*

Kata Kunci *: antrean, e-health, waktu tunggu, Puskesmas.*

Received: 11 November 2019 ***Accepted: 15 January 2020*** ***Published: 29 March 2020***

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.40-55

INTRODUCTION

In the era of industrial revolution 4.0, the development at any sectors has been seen and the globalization has given rise to rapid changes in the order of life and behavior of the people and the behavior of government officials. Changes that occur in the community then lead to the realization of improved government services with a better work system. The influence of globalization is colored by the rapid development of information technology that has led to a new revolution, namely the transition from conventional work systems to the digital. In government institutions, this change is marked by the abandonment of traditional governance which is identical to paper-based administration towards electronic government (e-government). The development of e-government is one of the government's efforts to improve the quality of public services effectively and efficiently in various public sectors. One of them is the increasingly sophisticated technology which probes to fill the expectation of every job or any other needs. A company or organization also expects technology to give accurate information fast. For this reason, technology has an important role in human life (Manurung, 2019).

Nowadays, understanding the reasons beyond the user acceptance or rejection of technology has become one of the most important concerns in the information technology sector (Momani and Jamous, 2017). Technology acceptance is about how people accept technology for use. Acceptance can be further described as a critical factor in determining the success or failure of technology so that understanding technology acceptance is important (Samaradiwakara and Gunawardena, 2014).

The development of technology is there for a health sector, especially health service facilities, such as primary healthcare centers and hospitals. Health service facilities have many problems. For instance, they have convoluted administration procedures, long queue traffic, inaccurate and incomplate patient data, unclear information, etc (Avinda and Handoko, 2017). As a result, the government needs to understand more about people's needs by giving the best services.

Based on the Regulation of Indonesian Ministry of Health No. 75 of 2014, a primary healthcare center is the first level of health service facility by prioritizing promotive and preventive actions to achieve pervasive public health in its working areas. A primary healthcare center must provide fast, appropriate, and best service according to patient's needs.

An increase in patient visits in the primary healthcare centers of Surabaya causes long queue in the registration counter. A queue is the moment when people are waiting to get a treatment or service (Ginting and Rahardjo, 2014). Long queue makes patients wait for a long time and waste their time to get a registration number. Because of this, Surabaya Government created an online registration system in the primary healthcare centers. The online registration system can ease people to register medical check up.

The online registration system is called Electronic Health or e-health. E-health is an information technology and communication service application which connecting supporting sectors in health (Sambuaga, Rindengan and Sambul, 2017). The e-health aims to enhance accessibility, efficiency, effectiveness, clinical quality process, and organizational business (Saharuddin, 2017). In the Regulation of Indonesian Ministry of Health No. 36 of 2009 about Health,

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.40-55

organizing an effective and efficient health service needs health information which can be accessed through an information system. E-health is one of the alternatives to overcome long queue and increase efficiency of registering patients' referral letter.

The Surabaya Health District Office along with the Population and Civil Registry Office collaborate to create e-health system that can be integrated with the registration system and patients' data in the primary healthcare centers of Surabaya (Setianto, 2016). The integrated e-health system can simplify the administrative process. Moreover, the Surabaya Health District Office partnered with the Communication and Informatics Office to facilitate internet network for accelerating the use of e-health. E-health applications can be downloaded on Play Store (Android user) or App Store (Apple user) as well as www.ehealth.surabaya.go.id.

The Surabaya Government provides an e-health menu on *e-kios* machine which is available in every primary healthcare center of Surabaya (Agastya and Fanida, 2016). The e-health in Surabaya has been implemented in 63 primary healthcare center and two district government hospitals, including dr. M. Soewandhie District Public Hospital and Bhakti Dharma Husada District Public Hospital. The existence of the online registration system or e-health there is expected to cut short waiting time in the registration counter. For this reason, this literature review discussed only the implementation of e-health in primary healthcare centers of Surabaya.

METHOD

This present study was a literature review discussing e-health. E-health is still a new innovation in health sector, thus articles that discuss e-health are limited. Google Scholar was chosen as the database for being subscribed by various open access journals. This study applied a qualitative approach by elaborating results descriptively. It utilized database from articles published from 2015 until 2019 on Google Scholar. Keywords used were "e-health Surabaya" and "*Puskesmas*" (primary healthcare centers) which are relevant to the topic of this study. This literature review on e-health and primary healthcare centers analyzed how successful e-health for an online patient registration in primary healthcare centers to reduce long queues at a registration counter and to advance the process of health services in primary healthcare centers. Based on the database and keywords, 14 articles were obtained, but only 6 articles had relevant topics. The results of the literature review were then explained in tables.

RESULTS AND DISCUSSION

At the beginning, the e-health was tested in ten primary healthcare centers of Surabaya. Those primary healthcare centers located in Ketabang Kali, Rungkut, Jagir, Kali Kedinding, Kedurus, Manukan Kulon, Peneleh, Pucangsewu, Simomulyo, and Dupak must have the International Organization for Standardization or ISO. So that the primary healthcare centers can be referred online to the dr. M. Soewandhie District Public Hospital and Bhakti Dharma Husada District Public Hospital. During the implementation of e-health, they often found some difficulties, such as the competence of human resources, organization's readiness, and organization's work culture. The supervision and evaluation of e-health were conducted over and over again to ensure that it works well. As the e-health runs properly, it has been implemented in 63 primary healthcare centers (100%). E-health as an internet-based service

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.40-55

systems and applications not only eliminate long queues, but referrals for patients are faster. By e-health, the patient does not need to bring all unnecessary files. They just need to bring their identity card. For the primary healthcare centers no longer need to ask the patient's name and identity because everything is connected through the management information system of primary healthcare centers. Table 1 explains the implementation of e-health in the primary healthcare centers of Surabaya.

E-Health as an Innovation for Registering Patients Online

In Table 1, the implementation of e-health was found in recent years. Before e-health was implemented, patient registration was noted manually. Data and medical history were input to the management information system of primary healthcare centers offline. Afterwards, the management information system of primary healthcare centers is integrated with data from the Population and Civil Registry Office, including personal identity (ID) number, personal data, address, and family members in Surabaya. Local citizens of Surabaya can register on e-health by inputting their ID Number, and automatically all their details are in the system. Whereas, patients who are not from Surabaya can register themselves by inputting ID Number and personal data manually.

E-health innovates in several aspects, including the service process, service method, policy, and system (Hafizh, 2016). E-health improves service by updating its process from manual entry to automatic entry. For example, a queue number and medical referral letter registration can be accessed online now. Moreover, e-health is useful for shortening patients' waiting time. With e-health, patients do not need to come to a primary healthcare centers to get a queue number. Regarding its influence on policy, e-health reforms a new vision, mission, purpose, and strategy as it addresses the real problems of health services in primary healthcare centers. In addition, e-health becomes a bridging point between Surabaya Government as the initiator of e-health, Surabaya District Health Office, Population and Civil Registry Office, and also Communication and Informatics Office.

Innovation has some levels according to its impacts which may happen during its implementation (Hafizh, 2016). Innovation is a way to introduce new ideas, new product, new service, and new kind of beneficial procedures (Saharuddin, 2017). It aims to upgrade the quality of products, services, and procedures. E-health becomes an innovation for providing better infrastructures in supporting the organizational activity and process. The levels of innovation involve incremental, radical, and transformative innovation. First, an incremental innovation gives a small or rare impact on organization's service or structure. The second level is radical innovation as a basic innovation that needs political support, thus is rarely used. Meanwhile, transformative innovation brings a big change in organization's structure and takes a longer time to achieve the expected results. E-health in the primary healthcare centers is on the incremental level because it only gives a small impact. E-health only gives two impacts on the process of patient registration and medical referral letter registration which have been accessed online and integrated with management information system of primary healthcare centers for more accessible patient data and patients' medical history.

E-health is a solution to the problem of patient queue traffic on each workday in primary healthcare centers. During this time patients have to queue for a long

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time, before the start of working hours at the primary healthcare centers. Through e-health, patients no longer need to bother waiting in line too early at the primary healthcare centers. By e-health, patients can register at a primary healthcare centers and can come for treatment according to the hours listed in queue numbers. This is more efficient for who have limited access to health and its information (Hafizh, 2016). E-health uses a humanist approach. The e-health application has three languages to communicate with patients who use text and audio services, namely Indonesian, Javanese, and Madurese. The choice of three languages is motivated not only because the population of Surabaya City is inhabited by Javanese and Madurese, but also to bring the e-health application closer to the population (Amah, 2016).

Innovation can be sustainable or discontinued (Hafizh, 2016). The e-health initiatied by the Surabaya Government is categorized into a sustainable innovation, giving an on-going change in the current service of patient registration and medical referral letter registration. E-health can make this process done online with a computerized system.

The main output expected from the online patient registration according to patients' perspective is a decrease in queue traffic at the registration counter. Also, it may increase the speed of health services. From health workers' perspectives, e-health is expected to reduce workloads and retrieve computerized patient data so that health workers accomplish lighter and easier works.

Diffusion of E-Health

Diffusion is an adapting process or innovation process as going through a media at a certain time. It occurs as an innovation creates and offers a newer, better, or more affordable product or service than the current one (Putri, 2016). Diffusion goes in some steps, such as researching information, introducing an innovation, persuading the community to use it, making decision to accept or reject an innovation, and implementing it. Once these steps have been done, the diffusion of innovation is successful.

E-health diffusion was created due to the large number of manual patient registration, thus e-health is required (Putri, 2016). By using e-health, patients have certain time for health service delivery without queing any more (Agastya and Fanida, 2016).

The diffusion of e-health can be done by distributing brochures and leaflets about getting a queue number with e-health to staffs and patients. Although e-health diffusion innovations have been carried out, not all primary healthcare centers have an efficient queue because not all patients use the e-health. This is due to an insufficient understanding of information and communication technology, unavailable internet network, and limited media are some reasons beyond this problem. Unfair socialization of e-health also contributes to on-going long queue. Another influential factor on the use of e-health is behavioral intention (Venkatesh, Thong and Xu, 2012). The effect of behavioral intention on technology use will decrease or increase along with the experience of technology use. The experience of technology use can measure user satisfaction with technology (Doll *et al.*, 2004). A decrease in technology use is caused by unsatisfied users, and vise versa.

E-Health as a New Public Service

Public service which exists as a new paradigm emphasizes the government's role to serve people pervasively (Yusfadhiyah, 2018). Public service is the basic service which can apply, implement, and also serve the community (Khotimah,

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Muchsin and Pindahanto, 2019). The given service is expected to satisfy the community. A new public service prioritizes not only citizens but also customers, seeks for public needs, values community welfare over bussiness profits, as well as find strategies and fairness.

E-health as a new public service applies to all levels of society. E-health for health services in primary healthcare centers counts as a means of speeding up queuing process and predicting disease patterns through observation on frequently accessed health services (Jaliyanti, 2018). The identified disease pattern informs the description of diseases in a region, thus it contributes to more effective disease prevention program. In the long term, it will give an impact on reducing the amount of morbidity in a certain region.

E-health as a public service gives good communication not only to customers but also community since it can be accessed in many areas in Surabaya. It can also identify the public needs as the users expect e-health developed (Yusfadhiyah, 2016). In addition, e-health prioritizes community welfare over bussiness profits as it is expected to assist people with difficulties of accessing e-health. Implementing e-health in health facilitites acquires the government to find strategies and project the right target, for example conducting socialization about e-health to patients.

The accountability of e-health is not simple, thus e-health serves rather than steers. In addition, it values not only people but also productivity (Yusfadhiyah, 2018). In this case, the government plays a role to serve community needs rather than control them in using e-health. E-health becomes an alternative to enhance productivity by giving easy access to health service and building an independent community.

Above all, staffs in primary healthcare centers should be ready to assist patients when facing troubles in e-health. Human factor becomes the most determining factor in succeeding the implementation of a new public service (Yusfadhiyah, 2018). The implementation of e-health is also monitored and evaluated to give a better service and to improve staff's work performance. Along with this way, the primary healthcare centers conduct training for their staffs to easily understand the use of e-health.

As previously explained, e-health is also used for online medical referral letter registration. The online system of medical referral letter registration has been connected to the health guarantor, for instance Social Security Agency for Health and hospital partners. Patients who have no health guarantor still uses manual medical referral letter registration. Because of e-health, people are expected to be more independent in utilizing technology and understanding its needs.

The Success of E-Health Service

A successful program has a good system, effective information system, and excellent services to people. In this section, whether e-health service has successfully been implemented in primary healthcare centers of Surabaya is presented.

Characteristics of a Good System

A good system is seen from some characteristics, for instance being flexible, easy to utilize, systematic, functional, simple, and efficient for using resources (Jaliyanti, 2018). Based on the implementation of e-health service in recent years, the e-health has fulfilled good characteristics of information system. In terms of flexibility, the e-health service uses database programs, including DBL SQL Server and Java Application. Those database programs are the best ones since many companies and organization have used the same programs (Memon *et*

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al., 2018). E-health is also considered can increase the staff's work performance at the primary healthcare center because it is easy to adapt and systematic in the implementation flow. Furthermore, it can decrease the duration of queue from 5 minutes to 2 minutes (Jaliyanti, 2018). E-health can be accessed through personal android phone, computer, and also *e-kios* machine in the primary healthcare centers. With its spread in many paltforms, everyone can access it easily.

Excellent Service

Excellent service is a service with a high-quality standard which follows the development of customer's needs consistently and accurately (Sumolang, Tumbel and Mandagie, 2019). The excellent service is apparent from staffs' ability and attitude, appearance, attention, action, and accountability as a principles of excellent service (Firdaus and Meirinawati, 2019). Staffs are expected to serve with excellence. It is not limited to serving in accordance with patient expectations but is able to serve beyond patient and her or his family expectations (Syafitri *et al.*, 2019).

To support human resources in operating e-health, the primary healthcare centers of Surabaya provide training to their staffs. Moreover, they demand their staffs to politely respond patients' suggestion and criticism as well as show the best physical appearance. As they want to be open to suggestions, they provide a suggestion box where patients may give their opinion of online registration system (Jaliyanti, 2018).

Furthermore, the primary healthcare centers promote the e-health through brochures and leaflets illustrating the e-health service procedures . All of articles discussed have stated that some obstacles in implementing e-health include lack of promotion and lack of *e-kios* provided in primary healthcare centers.

Successful Elements of E-Government Project

Many factors can affect program success. Research shows that leadership quality and effective communication play an important role in project success (Fayaz, Kamal and Amin, 2017). Pre-development activities are also required during project implementation because they can reduce the failure project rates, especially in information technology systems (Hamada, Mazen and Hassanein, 2011). E-government project in health sector is manifested in the form of e-health as an online registration system. Based on the articles discussed that the successful elements of e-government project such as e-health are political environment, leadership of the head of the e-health and the expert staff, planning, stakeholders, transparancy or visibility, budget, technology, and innovation (Marshela, 2017).

Political Environment

A political environment is a public situation in which a project is planned in the forms of TDP (Top-Down Project) or BUP (Bottom-Up Project). The primary healthcare centers have TDP-oriented policy which gain support from the executive government. This TDP-oriented policy aims to create a sequent administration and efficient governmental affairs. It is noticable that the e-health is fully funded by Surabaya District Health Office allocating the District Government Budget. Moreover, TDP-oriented policy expedites patient registration and the reporting procedures to Surabaya District Health Office. The implementation of e-health in the primary healthcare centers is also supported by the Regulation of Indonesian Ministry of Health No. 46 of 2014 about Health Information System, that Health Information System is a set sequence that includes data, information,

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indicators, procedures, devices, technology and resources human beings who are interrelated and managed in a way integrated into direct or action useful decisions in support health development. Another study stated that a political environment has a significant influence on project success, such as the success of e-health. In this case, a political environment possesses an effective management role (Mark and Nwaiwu, 2015).

Leadership

Leadership influences the implementation of a program since leaders have a great authority and responsibility for the program. Leadership quality plays an important role in program success (Fayaz, Kamal and Amin, 2017). The implementation of e-health involves some experts of information and communication technology who have good leadership skills. Those experts are in charge to monitor if there are some troubles in the internet network. While, the heads of primary healthcare centers do not directly contribute to the implementation of e-health service since the e-health is closely related to the experts of technology and communication who manage the process thorougly (Marshela, 2017).

Planning

Planning is the first stage in implementing a program. In the first implementation of e-health, the primary healthcare centers of Surabaya had made some plans to find some ways of introducing e-health to the staffs and community. They have shown good planning stage. The good planning stage is shown by the training and socialization activity for all the staffs to introduce e-health to people, and thus they can use the facility easily (Marshela, 2017). The Surabaya Government has also conducted trials in 10 primary healthcare centers to find out the influence of e-health on healthcare service process. If a mismatch of expectations and reality occurs, improvements can be made (Hamada, Mazen and Hassanein, 2011).

Stakeholders

Stakeholders can be a factor driving sustainable technology (Singh *et al.*, 2019). Stakeholders can encourage people to use new technology, such as e-health. As the main stakeholders in the implementation of e-health, Surabaya District Health Office, Population and Civil Registry Office, and Communication and Informatics Office collaborate with the experts of information and technology in every primary healthcare center. The related stakeholders have a high commitment to communicate and cooperate among the staffs and community (Agastya and Fanida, 2016).

Technology

Technology is the basic asset for digital era. In implementing e-health, technology has been proved to have a good quality because it is designed with database DB2 SQL Server and Java Application which are categorized as the best database program for companies and organization (Memon *et al.*, 2018). Some of the primary healthcare centers in Surabaya also provide computers to access e-health from website and a printer to print out a queue number (Agastya and Fanida, 2016; Marshela, 2017). Thus, using e-health informs patients queue numbers for nursing room.

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Table 1. Implementation of E-Health in Primary Healthcare Centers of Surabaya.

Authors	Aims	Methods	Results
Dwi Jaliyanti, 2018	To describe the implementation of e-health in Peneleh Primary Healthcare Center, Genteng Sub-District, Surabaya.	Method: A descriptive method with qualitative approach. - Location: Peneleh Primary Healthcare Center. - Respondents: 10 staffs in Peneleh Primary Healthcare Center . - Techniques of data collection: a standardized interview, observation, and documentation to search required data from related sources. - Validity test: triangulation technique (for all instruments).	**E-health has a good system.** 1. Designed by using database program DBL SQL Server and Java Application. 2. Excellent skills of the staffs in operating e-health. 3. E-health supporting the function of management process in primary healthcare centers. 4. Able to decrease long duration of queue in the registration counter. 5. Accessible on mobile phone, computer, and *e-kios* machine, fastening the process of registration service. 6. Encouraging knowledge transfer to patients. **E-health has an effectivity information system.** 1. Equipped with data security features for recovery data. 2. Shortening queuing time to be 2 minutes. 3. Able to detect a disease as early as possible which may have potentials to outbreak. 4. Providing reports as an output which is required for a variety of administrative activities to Surabaya District Health Office. 5. Offering easy access to health services. **E-health can implement excellent services.** 1. A good operational skill of the staffs after getting training of e-health procedures. 2. All staffs respecting patients. 3. Neat and polite staffs in serving patients. 4. Providing a suggestion box to identify patients' needs and expectation. 5. Un-well implemented e-health without socialization to

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Authors	Aims	Methods	Results
			community. 6. Stand-by operators for assisting patients in using e-health.
Dwi Putri Marshela, 2017	To describe the implementation of e-health service in Ngagel Rejo Primary Healthcare Center, Surabaya.	Method: A descriptive method with qualitative approach. - Location: Ngagel Rejo Primary Healthcare Center. - Technique of data collection: interview, observation, and documentation to require get data. - Respondents: party responsible (staffs in Ngagel Rejo Primary Healthcare Center) for the e-health service and the users (patients). - Validity test: triangulation techniques to increase the level of trust for all instruments.	**Key success of e-health.** 1. Has Top-Down Project (TDP) policy. 2. Involving experts of information and communication technology. 3. Conducting a training for all staffs. 4. Cooperation between Population and Civil Registry Office and Communication, Informatics Office and experts of information and communication technology in every primary healthcare center. 5. Conducting socialization of e-health use to patients. 6. Allocating funding from Surabaya District Government Budget. 7. Providing *e-kios* machine, a computer, and a printer to fasten services in primary healthcare centers. 8. Conducting socialization of e-health to community.
Delza Abdul Hafizh, 2016	To describe the implementation of e-health service to upgrade the quality of health service in Pucangsewu Primary Healthcare Center.	Method: A descriptive method with qualitative approach. - Location: Pucangsewu Primary Healthcare Center. - Respondents: staffs in Pucangsewu Primary Healthcare Center selected by using purposive sampling - Techniques of data collection: interview and documentation to search required data. - Techniques of data analysis: data reduction, data presentation, and	**Innovation typology, level, and category of e-health implementation.** 1. Innovation for service process in which patients who were used to taking a queue number and registering medical referral letter manually can accesse them online now. 2. Innovation for service method which reduces patients' waiting time to get a queue number and medical referral letter which can be registered directly to a referral hospital. 3. Innovation for policy which is under the Surabaya Government as the initiator.

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Authors	Aims	Methods	Results
		conclusion. - Validity test: triangulation technique to validity the results of research, just like comparing observational data with interview data, then with related documents.	4. Innovative system where management information system of primary healthcare centers has been integrated into e-health service. 5. Being on the incremental level because e-health only gives a small impact on patient registration and medical referral. 6. Being a sustainable innovation because e-health gives a change and retain the running service and system.
Nur Sa'idah Yusfadhiyah, 2018	To explore the implementation of e-health as a new public service in primary healthcare centers in all primary healthcare centers of Surabaya City.	Method: A descriptive method with qualitative approach. - Location: All Primary Healthcare Centers of Surabaya City (63 Primary Healthcare Centers). - Respondents: staff in Primary Healthcare Centers of Surabaya City chosen by purposive sampling. - Technique of data collection: in-depth interviews, observation, and documentation. - Technique of data analysis: data reduction, data presentation, and conclusion. - Validity test: triangulation technique to eliminate and compare differences in respondents views during the data collection process.	**E-health as a new public service.** 1. Accessible in many areas in Surabaya. 2. Slowly but surely, high adaptability of patients in using e-health. 3. Stand-by staffs needed to help patients in using e-health. 4. Conducting socializationof e-health repetitivelyto encourage patients obey the rules. 5. Staffs following the operational procedures of services to increase patients' attention in using e-health. 6. As much as 71.49% of Customer Satisfaction Index (CSI) meaning that the services can satisfy patients. 7. Easy access to health services, such as easy way for registration.
Krishnawan Panji Agastya, Eva Hany	To identify the implementation of e-health service in Jagir	Method: A descriptive method with qualitative approach. - Location: Jagir Primary Healthcare Center.	**The success of e-health implementation.** 1. Supported by the Regulation of the Government No. 46 of 2014 about Health Information System. 2. Patient database management in the e-health system

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Authors	Aims	Methods	Results
Fanida, 2016	Primary Healthcare Center, Wonokromo Sub-District, Surabaya.	- Respondents: staffs in Jagir Primary Healthcare Center chosen by using purposive sampling. - Instruments: 8 successful elements of e-government project. - Techniques of data collection: In-depth interviews, observation, and documentation. - Techniques of data analysis: data reduction, data presentation, and conclusion. - Validity test: triangulation technique toward respondents to compare the observational data, interview data, and related documents.	under Surabaya District Health Office. 3. E-health design using the DB2 SQL Server database program and Java Application. 4. Developed by the Surabaya Government in collaboration with the District Health Office, Population and Civil Registry Office, and Communication and Informatics Office. 5. Being transparent in the implementation of e-health by using promotion media and suggestion box. 6. Funded from Surabaya District Government Budget. 7. Providing *E-kios* machine, a computer and a printer in each primary healthcare center. 8. Socializing e-health by disseminating brochures and posters.
Anggraeni Savira Putri, 2016	To describe the diffusion of e-health in Kalijudan Primary Healthcare Center, Surabaya.	Method: A descriptive method with qualitative approach. - Location: Kalijudan Primary Healthcare Center. - Respondents: patient in Kalijudan Primary Healthcare Center selected by using purposive sampling. - Techniques of data collection: interview and documentation. - Techniques of data analysis: data reduction, data presentation, and conclusion.	**The diffusion process of e-health.** 1. Conducting socialization to patients by distributing brochures of how to pick a queue number by using e-health. 2. Decrease in the duration and traffic of queues in a health service facility. 3. Patients lacking capability in using e-health. 4. Lack of information and communication, internet network, and media. 5. The unbalance and unclear socialization to patients identified as problems.

** Secondary data, Literature Review*

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Innovation

E-health has changed manual registration to online registration, thus, making patients easier to access patient registration (Agastya and Fanida, 2016). To support online patient registration, the government can create another innovation, for instance conducting training for health staffs and practical socialization to patients in using e-health service from *e-kios* machine, website, or android mobile application (Putri, 2016; Marshela, 2017; Sa'idah, 2017).

The Benefit of E-Health System

Based on the articles discussed, there are some benefits of e-health system. First, e-health system is facilitating services for patients in the Surabaya City by only carrying identity number (Hafizh, 2016). Second, e-health system speeds up the patient referral system and improve the quality of patient services based on the patient's medical resume referred (Hafizh, 2016). Third, e-health system is facilitating access to patient registration and reducing time in the primary healthcare centers (Putri, 2016). Fourth, e-health system reduces data entry requirements for primary healthcare center staffs (Yusfadhiyah, 2018).

Monitoring and Evaluation System of E-Health Implementation

A monitoring system is the process of observing and tracking system at run time. It is the basis of control operations and corrective actions for running systems (Alhamazani *et al.*, 2015). Meanwhile, an evaluation system is a part of the management system and the process of determining the effectiveness of performing and implementing the system (Tetiana *et al.*, 2018). The monitoring and evaluation is carried out by the system by the Surabaya District Health Office through an application dashboard that monitors the number of online referrals, ten most diseases, types of patient payments, polyclinics most visited, how many health workers serve people, and registration of monitoring real time at the primary healthcare centers.

The Impact of E-Health Implementation

The gap in information and technology capability that still occurs in Surabaya City people and internet network traffic that is busy with limited bandwidth during peak hours, can be overcome by providing free internet training to the public through the Broadband Learning Center (BLC) which is spread throughout in all district offices (Putri, 2016). In addition, by alerting officers at the district offices to help people who experience difficulties when interacting with e-health. Provides free wifi in all pulbic places so people can use it to learn the internet. Meanwhile, heavy internet network traffic, especially during peak hours, can be overcome.

The positive impact that can be taken is the people's trust in health services in the Surabaya City to be positive so that with a positive mindset the people will be able to help the government by contributing ideas, thoughts, and energy towards ideal health services for Surabaya City. In addition, through this initiative, an overview of the Surabaya population health database can be obtained, which later the data can be integrated with other data (Marshela, 2017).

For the long impact, the presence of integrated data potentially can develop a disease prevention and health maintenance program. This program will be based on frequently accessed health services which gather as disease patterns seen in e-health system (Agastya and Fanida, 2016). The expected outcome of the programs is a decrease in morbidity

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and an increase in the levels of public health to create healthy communities.

CONCLUSION

E-health is considered successful when it can implement a good system, become an effective information system, and provide excellent services. The output of an online patient registration system is a decrease in queue traffic and shorten its duration. As a result, patients do not have to wait long for queue number to receive desired health service. E-health is also give a positive effect in medical referral letter. E-health is integrated with a management information system of primary healthcare center as staffs will be easier to report and monitor early diagnosis. Therefore, it can help disease prevention success and health maintenance program. The expected outcome of the program is a decrease in morbidity and an increase in the levels of public health to create healthy communities. However, there are some shortcomings in the implementation of e-health in primary healthcare centers. One of them is the unbalanced socialization of the e-health to patients. Therefore, some people still face difficulties in operating e-health, turning out to register themselves manually. Training health staffs is required, and thus they are able to operate the e-health service and transfer their knowledge to patients.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest for this article.

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Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.40-55

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.56-64

COMMENTARY ARTICLE

SOCIAL ENGINEERING AS AN EVOLUTIONARY THREAT TO INFORMATION SECURITY IN HEALTHCARE ORGANIZATIONS

Social Engineering sebagai Ancaman Evolusioner terhadap Keamanan Informasi dalam Organisasi Pelayanan Kesehatan

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ABSTRACT

Information security in healthcare settings is overlooked even though it is most vulnerable to social engineering attacks. It is critical to monitor thefts of hospital data as it contains patients' confidential health information. If leaked, the data can impact patients' social as well as professional lives. The hospital data system includes administrative data, as well as employees' personal information, and if hacked, can lead to identity theft. The current paper discusses the types and sources of social engineering attacks in healthcare organizations. Social engineering attacks occur more frequently than other malware attacks, and hence it is crucial to understand what social engineering is, and its vulnerabilities, to stimulate preventive measures. The paper describes types of threats, potential vulnerabilities, and possible solutions to prevent social engineering attacks in healthcare organizations.

Keywords: social engineering, hospitals, healthcare organizations, information security.

ABSTRAK

Keamanan informasi pada bidang pelayan kesehatan terlalu dikesampingkan meskipun aspek ini merupakan aspek paling rentan terkena rekayasa sosial. Pencurian data informasi rumah sakit penting untuk diawasi karena informasi semacam itu mengandung informasi rahasia kesehatan pasien, yang bisa memengaruhi kondisi sosial dan kehidupan profesional pasien jika rahasia tersebut terbuka. Sistem data rumah sakit seperti data asministrasi dan informasi pribadi pegawai, yang dicuri dapat menyebabkan pencurian identitas. Artikel ilmiah ini membahas tentang tipe-tipe dan sumber pencurian data dalam organisasi kesehatan. Pencurian data lebih sering terjadi dari pada serangan virus lainnya, sehingga penting untuk memahami pengertian rekayasa sosial dan kerentanannya sebagai usaha memahami cara pencegahannya. Artikel ini membahas juga jenis ancaman, kerentanan yang potensial, dan solusi yang mungkin diambil untuk mencegah serangan rekayasa sosial dalam organisasi kesehatan.

Kata kunci: *rekayasa sosial, rumah sakit, organisasi kesehatan, keamanan informasi.*

Received: 9 November 2019 ***Accepted: 20 January 2020*** ***Published: 5 April 2020***

Social engineering is an extraordinarily complex manipulation performed by hackers to gain unauthorized access to data or systems. It is a well-planned strategy exploiting the trust factor between human beings: people naturally trust a stranger asking for help and are willing to help them. Hackers, on the other hand, seek to benefit from such kindness and abuse it (Salahdine and Kaabouch, 2019).

In today's fast-paced world, every employee in industry, business, or professional organizations becomes more flexible and more susceptible to use personal phones or devices for accessing company's or enterprise's data (Krombholz, Hobel, Huber, and Weippl, 2015). By opening up the options for communication channels like web 2.0 (which includes Facebook and Twitter as well as other internet resources), we are increasing our susceptibility to data theft

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.56-64

and security breaches in healthcare settings. Allowing individual hospital/healthcare information to become available in the public domain might pose severe threats to an enterprise from hackers. Several organizational theories, including structural contingency theory and transaction cost theory, describe how technological innovations lead to changes in healthcare organizational structures (Mick and Shay, 2014). Such innovations might include installing a new software program in the hospital database for improved efficiency (like the EPIC system) or buying new technology in general.

The current paper explores one such aspect of healthcare organizations: hospital information system security. Many studies have talked about information security and its essentiality for different corporate business settings or government institutions, but less focus has been given to hospital information system security (which includes patients' electronic medical records, hospital administration information, as well as general technology information relevant to employee access, and employee payroll). Social engineering is one of the aspects that needs attention in the healthcare sector. This sector includes the pharmaceutical industry, hospitals, health insurance companies, private and government-funded dental clinics, and general health clinics that have sensitive patient health information. It is vital to understand the different types of social engineering attacks, as well as possible vulnerabilities in less-researched fields of healthcare where patients' private information is most prone to identity theft and tampering (Conteh and Schmick, 2016). Globally, the field of information security has advanced from simply installing antivirus software to proactively training employees and increasing awareness regarding susceptibility to and forms of social engineering attacks. Governmental bodies have also set specific standards with penalties if patients' information data is left unprotected and subsequently breached. However, as hackers' resources and types of social engineering attacks continuously evolve, it becomes essential to understand the different types of social engineering attacks and their sources. The objective of the current paper is to address these questions. It further discusses different healthcare settings that are potentially susceptible to the theft of patients' health data and provides possible solutions.

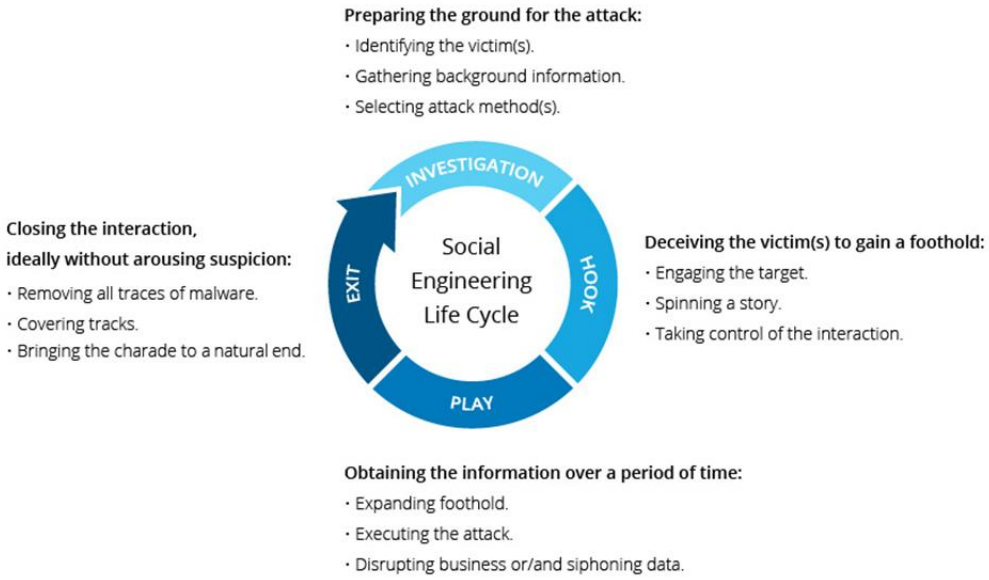
Approaches and types

There are several approaches to social engineering attacks that can be used, individually or in combination, to attack any security system (Krombholzj *et al.*, 2015). A technical approach is one of the types implemented in the healthcare sector (Mohan and Singh, 2016). Several breaches leading to misrepresentation and tampering of electronic medical records have therefore surfaced. Internal and external types of threats pose different forms of hospital information security danger (Samy, Ahmad and Ismail, 2010). Of all types, the power failure of servers or acts of human negligence are potentially avoidable but nevertheless increase security threats (Samy, Ahmad, and Ismail, 2010).

Physical approaches

Physical approaches obtain information collected through a physical method such as dumpster diving. Attackers might retrieve sensitive information, such as notes with passwords, printouts with an address or other hospital-confidential information, by going through garbage. Physical approaches can also include physical theft of data or threatening a person who has access to sensitive health data systems. Healthcare organizations that handle or store confidential health data

are always susceptible to security threats and are therefore expected to be more vigilant. All sensitive paperwork revealing patient identity or income ought to be securely shredded and disposed of or else handed to someone who will dispose of it later. Moreover, any signed documents, x-rays, prescriptions, or case reports should be stored safely and securely with physical access limited to authorized personnel. Currently, the majority of healthcare organizations have a secure paperwork disposal policy, including the use of shredders, separate garbage disposal of confidential paperwork, etc.



Source: Imperva Incapsula (2019)

Figure 1. Life cycle of social engineering.

Figure 1 exhibits the stages of security threat attacks to help understand the entire process of social engineering. Each type and approach mentioned in the paper follow the stepwise process of the cycle. It helps to better understand any security threats in the healthcare sector.

Social approaches

Hackers or attackers usually try to develop a relationship with potential future victims. This is one of the most popular strategies as it involves a trust factor. Once people get to know each other, they might relay specific information such as access codes to healthcare organization data systems and thereby give it to a stranger who is actually unauthorized to receive it. For example, a nurse practitioner having electronic medical record access working in a hospital might provide password credentials to temporary interns or fake patient family members. In both scenarios, either the temporary interns or the disguised family members might get access and misrepresent or tamper with unauthorized electronic confidential medical records of a specific patient. The temporary interns might also try to gain nurses' trust by developing friendships and

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.56-64

helping nurses reduce their daily workload. After several days of interaction, nurses who are unaware of the real intentions of the hackers might provide their data-access credentials upon either being asked or by unknowingly typing it in front of the hackers. This conventional approach can occur in several settings, such as hospitals, insurance companies, government health data offices, or universities analyzing and collecting patients' confidential health data as part of a research project. Hence, it is vital to determine and understand whom an authorized person can share their authentication credentials with. Thus, in the United States, it is essential for those who are involved in managing and handling health information to undergo formative training and certification under the Health Insurance Portability and Accountability Act (HIPAA). Also, to continually maintain health data security, it is critically important to safeguard confidential medical information of civilians from any country, and such policies should be enforced.

Technical approaches

Several social networking websites serve as a reservoir of personal information. Attackers collect such information via a number of internet resources to attack a victim. A hospital employee might post pictures with background reflecting passwords or other sensitive data in the pictures on social media platforms. The HIPAA enforces strict policies and rules for individuals and professionals who serve on governing bodies in the United States, including the amendment of existing rules for better safeguarding of citizens' health information. It also enforces penalties and punishments if rules for the safety of health data are not obeyed (Office for Civil Rights, 2013).

Reverse social engineering approaches

This is a type of social engineering in which attackers play the role of helpers and do not approach the victim initially. They would then create a problem for the victim without the victim knowing and would then contact them offering a helping hand. The victim, on the other side, would accept the help and provide information like password or personal information or install an application that would hack all the personal data.

Socio-technical approaches

A socio-technical approach is a combination of the social aspect and technical element. An attacker would generate malware in a folder or USB drive labeled with a name that will trick the victim into clicking it. A hospital visitor might ask a receptionist to plug in the USB to gain entry into the hospital IT system.

Office communication approaches

Internal communications amongst colleagues via email might open the door for attackers using similar-appearing email addresses, as an employee who is in a rush might not check the exact addresses and end up becoming a victim. It can involve a physician handling confidential health data of current patients or nurses or others.

Computer-supported collaboration approaches

Several channels of communication between clients and company employees might open up a potential loophole for the security breach. Several web 2.0 services might also become a tool for hackers.

External communication approaches

Apart from internal office emails, several external communications involve blogs and web 2.0 services which might open a channel for several types of social engineering attacks (Conteh and Schmick,

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.56-64

2016). The approaches explained previously are possible platforms or resources used to implement a security threat. The types of social engineering attacks provide information about existing practical scenarios and ways in which an attack could occur. Understanding the types allows one to see how one might be susceptible to security threats while being exposed to any of the approaches mentioned above, like working in hospital offices, being an active user of social media, etc.

Phishing approaches

This is a type of attack in which a message or email would redirect the victim to a legitimate-appearing site and would ask for personal identification information. The message would reflect a sense of urgency and test an individual's excellent knowledge in judging information in the extreme environment.

Baiting approaches

This is similar to phishing, but the attacker lures the victim into providing personal identification information by offering a gift or free flight tickets for a vacation.

Quid pro quo approaches

This is a hybrid version of the others. The attacker would offer assistance and pretend to be a technical expert when the victim is facing technical issues. The attacker would ask the victim to install malware in one way or the other.

Tailgating approaches

The attacker would try to gain access to a restricted area by following/tailgating a person having access to that area. This is also another type of social engineering in which the attacker pretends to be trustworthy.

Pretexting approaches

The attacker in this scenario uses a well-rehearsed story to trick the victim. The story would require urgent action and leave little time for the victim to think.

Many cybercrimes occur because of the easy availability of personal data as well as enterprise information on the internet. The majority of social engineering attacks are anonymous, and hence it is difficult to catch the hacker and charge them for the crime. This might be the underlying reason why social engineering, as well as cybercrime, is increasing. Most of the attacks are successful due to the vulnerability of the victim.

Vulnerabilities

Social engineering attacks are never successful unless the potential victim is vulnerable in one way or another. Hackers often target a person's psychological weaknesses after researching the person thoroughly. Vulnerabilities can be anything from using the same password or access codes for all applications, or not taking password security training seriously enough (Medlin, Cazier and Foulk, 2010). Other situations could include passwords being simply inadequate (even if changed sufficiently often) or someone being willing to share an updated password with somebody. In fact, researchers found that more frequent changes of passwords made an individual more likely to share passwords (Heartfield, Loukas and Gan, 2016).

Moreover, it has been observed that females exhibiting neurotic behavior are more vulnerable than other females and males in terms of responding to phishing emails or visiting insecure websites. Overall female users are more susceptible to such attacks than males. Finally, the traits of being talkative, conversational, open, and positive can make someone more vulnerable to social engineering attacks (Heartfield, Loukas and Gan, 2016).

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.56-64

Hence, taking the susceptibilities of potential victims into consideration can help attackers to formulate the attacks in their developmental stage. Identifying and addressing the vulnerabilities at both individual and organizational levels can help to reduce such attacks in healthcare organizations.

Settings and contexts vulnerable to social engineering attacks

It is not just enterprises or big corporations that are targeted for such social engineering attacks but also healthcare industries like hospitals (Medlin, Cazier and Foulk, 2010). The reason for targeting healthcare systems is the availability of patients' health information, including their demographics. Certain thefts might allow attackers to use somebody's health identity to receive health insurance benefits. It can lead to general identity theft or heightened insurance charges/fees. Breaches of personal health data might also make someone vulnerable to different types of discrimination from health insurance coverage denial to discrimination in a social and professional environment.

People are more vulnerable to persuasion especially when it is a higher authority body that is demanding information (Bullée *et al.*, 2015). A person who is a hacker might act as if they are from a project management office or a government body auditing the hospital; they might pretend to be a chief executive officer and demand specific information about hospital settings. In such a context, people often fall prey more quickly because the potential hacker seems to be a legitimate source or might dress up as a credible person, such as a police officer. A hack into an organization's information might lead to a loss of confidential information to rivals, physical damage to data and property, loss of clients' information including credit card information or healthcare sensitive data, and might lead to a loss of trust in the organization (Chitrey, Singh and Singh, 2012).

A hack into a pharmaceutical industry database containing clinical trial data for ongoing drugs or other medical device testing is another example of a vulnerability. Testing of new drugs and medical devices is an essential and continuous process (Patel, 2019). Hence, healthcare system settings are vulnerable to social engineering attacks. Reverse social engineering attacks on social networks online show that not only are hospitals and other settings targeted for social engineering attacks but attackers also execute reverse social engineering attacks through online social networking services like Facebook, LinkedIn, and Friendster (Irani *et al.*, 2011). Using social networking websites for social engineering attacks is effective since potential victims might consider accepting a friend request from a stranger (attacker), perhaps through several mutual friends or having an attractive profile picture to lure the victim. Once the attacker gains access to information about the victim, it becomes easy for an attacker to execute a reverse social engineering attack.

Precautionary Steps

Technical and physical security measures are not enough to prevent social engineering attacks in healthcare organizations. Since this unique type of hacking attack centers on persuasion, the first step should be raising awareness amongst colleagues, employees, patients, and every single individual working in that healthcare organization. While some people might already have some awareness of the topic, unless the importance and risks are emphasized, the organization might end up in a hazardous situation. Educating a vulnerable population in healthcare organizations is

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.56-64

the most effective way to mitigate such attacks (Smith, Papadaki and Furnell, 2013). Using websites or digital storytelling and educating to raise awareness of social engineering attacks and how to avoid them might also help to mitigate the problem of vulnerability (Patel, 2017). The widespread limitation of social networking websites like Facebook for revealing personal details might make a potential victim more vulnerable (Jagatic *et al.*, 2007). Thus, simple precautionary measures, such as establishing a user profile only visible to friends, changing the last name slightly or removing it altogether, might make a person less searchable on social networking websites and their directories (Brown *et al.*, 2008). For example, revealing fewer details on social networking websites about a new job position or checking in at hotels.

Apart from personal training and education, at the organization-level several frameworks have already been researched and tested. These include authorization, authentication, accounting, sandboxing techniques, developing and implementing strict enterprise policies/laws, monitoring, machine learning, and integrity checking (Heartfield and Loukas, 2015). Evaluating existing organization policies could help to safeguard health information better and translate research results of an improved security system into real-world implementations (Patel, 2018).

CONCLUSION

Understanding the types and techniques used in social engineering in the first place will help to mitigate attack attempts in healthcare settings. Keeping updated regarding evolutionary attacks might also help to avoid falling prey to such attacks and avoid risking patients' health data. Organizational measures are all secondary level steps, however, since it is down to individuals to evaluate a spam email, phishing email, or whether the website they are clicking contains malware. Keeping it simple is the most effective way to avoid spreading information to potential attackers. Not posting information in the public domain reduces the chances of being vulnerable. Alternatively, training hospital/healthcare employees about potential threats to the confidential health data of patients and providing contingency plans might help secure patients' information.

Strict workplace policies should be developed for countries that currently lack monitoring on the safeguarding of the personal and sensitive health data of their citizens. In order to continue maintaining patient and consumer trust, healthcare organizations and authorities should develop policies similar to the HIPAA to train every employee who is directly or indirectly involved in the management, collection, analysis and storage of confidential healthcare data related to patients' identity.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest for this article.

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.79-90

ORIGINAL RESEARCH

THE EFFECT OF CLINICAL PATHWAY COMPLIANCE ON REDUCING LENGTH OF STAY

Pengaruh Kepatuhan Alur Klinis Dalam Menurunkan Lama Rawat Inap

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ABSTRACT

Background: A clinical pathway is a multidisciplinary care plan based on the best clinical practice for a group of patients with a particular diagnosis designed to minimize care delay and maximize the quality of care and clinical outcomes. In 2017, the average length of stay for pediatric patients with acute gastroenteritis was prolonged even though clinical pathways had been implemented.
Aim: This study aims to determine the relation between the diagnostic examination and therapy compliance of the clinical pathway related to the length of stay.
Method: This study was cross-sectional research utilizing simple random sampling. Researchers analyzed pediatric patients whose clinical pathway was fully completed by doctors. The inclusion criteria were pediatric patients admitted to hospitals between January and December 2018 as acute gastroenteritis patients. The data were analyzed using multiple classification analysis.
Results: There were 197 patients whose clinical pathway was fully completed. In total, 60.91% of cases were compiled for diagnostic examination and 88.32% for therapy. There was no statistically significant correlation between diagnostic examination compliance ($p > 0.05$) and therapy compliance ($p > 0.05$) of the clinical pathway and patients' length of stay (combined = $p > 0.05$).
Conclusion: Many factors could be related to the length of stay, especially patients' condition. In this study, clinical pathway compliance had no impact on reducing length of stay.

Keywords*:* clinical pathway, compliance, length of stay, pediatric.

ABSTRAK

Latar Belakang: *Alur klinis merupakan rencana perawatan multidisiplin berdasarkan praktik klinis terbaik untuk sekelompok pasien dengan diagnosis tertentu, yang dirancang untuk meminimalkan keterlambatan perawatan, memaksimalkan kualitas perawatan, dan hasil klinis. Pada tahun 2017, rerata lama rawat inap pada kasus gastroenteritis anak-anak memanjang meskipun implementasi alur klinis telah dilakukan.*
Tujuan: *Tujuan penelitian kami adalah untuk menentukan apakah kepatuhan pemeriksaan diagnostik dan terapi pada alur klinis berhubungan dengan lama rawat inap.*
Metode: *Desain penelitian ini adalah cross sectional dengan simple random sampling. Kami menganalisis pasien anak yang alur klinisnya diisi sepenuhnya oleh dokter. Kriteria inklusi adalah anak-anak, dirawat di rumah sakit selama Januari hingga Desember 2018 dengan gastroenteritis akut. Data dianalisis dengan analisis klasifikasi ganda.*
Hasil: *Terdapat 197 pasien dengan alur klinis telah terisi lengkap, dimana sebesar 60,91% dari total kasus yang ada telah patuh terhadap kriteria pemeriksaan diagnostik dalam alur klinis dan sebesar 88,32% pada bagian terapi. Tidak ada hubungan yang signifikan secara statistik antara kepatuhan pemeriksaan diagnostik ($p > 0,05$) dan kepatuhan terapi ($p > 0,05$) dengan lama rawat inap pasien (gabungan = $p > 0,05$).*
Kesimpulan: *Banyak faktor yang dapat dikaitkan dengan lama rawat inap terutama kondisi pasien itu sendiri. Dalam penelitian ini, kepatuhan alur klinis tidak berdampak dalam mengurangi lama rawat inap.*

Kata kunci: *alur klinis, anak-anak, kepatuhan, lama rawat inap.*

Received: 1 March 2020 ***Accepted: 4 April 2020*** ***Published: 20 May 2020***

INTRODUCTION

A clinical pathway (CPW) is a multidisciplinary care plan based on the best clinical practice for a group of patients with a particular diagnosis designed to minimize care delay, optimize resource utilization, and maximize the quality of care

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Published by Universitas Airlangga
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and clinical outcomes (Aspland *et al.,* 2019; Kaiser *et al.,* 2018; Aniza *et al.,* 2016; Li *et al.,* 2014; Fujino *et al., et al.,*2014*et al.,et al.,*). The CPW was originally developed in the United States, Australia and the United Kingdom as a way to increase efficiency and reduce clinical costs (Mammen, Matsell and Lemley, 2013). Li et al. (2014) stated that the concept of the CPW was introduced for the first time at the New England Medical Center (Boston, U.S.A) in 1985 by Karen Zander and Kathleen Bower. It arose following the introduction of diagnosis-related groups (DRG), the first widespread system of diagnostic classification underlying bundled payment for episodes of care (Mammen, Matsell and Lemley, 2013). The CPW is utilized in hospitals and various healthcare organizations in many parts of the world, including Asia (Aniza *et al.,* 2016). It is utilized as an audit and re-audit tool and for quality assurance (Wetherill *et al.,* 2016).

A CPW is also known as a "care pathway", "critical pathway", "integrated care pathway" and "care map" (Aspland *et al.,* 2019). Many criteria can be utilized to determine whether it is CPW or not. The first criterion is a structured multidisciplinary plan of care (Aspland *et al.,* 2019). Such a plan of care is designed based on the existing clinical guideline or clinical evidence (Aspland *et al.,* 2019). The existing clinical guideline or clinical evidence should be reviewed and adjusted, and the specifics of the local environment and the realities of local practice should be formed as the CPW (Buchert and Butler, 2016). The CPW is linked with evidence to practice and optimize clinical outcomes while maximizing clinical efficiency (Fujino *et al.,* 2014). A CPW can be created by adapting the documents utilized in hospitals known as Standard Operating Procedures that aim to improve the efficiency of services provided by health care workers (*et al.,*Aspland *et al.,* 2019; Li *et al.,* 2014; Zhang *et al.,* 2014). Guidelines and evidence-based practice need to be combined with best practice rules to produce good CPWs (Kolk *et al.,* 2017). The plan of care details the steps in a course of treatment or care and includes time frames for every treatment stated (Aspland *et al.,* 2019).

A CPW is a standard of care delivery that includes assessment, diagnosis, information support, rehabilitation, and clinical audit (Asmirajanti *et al.,* 2018). It can help identify the critical components impeding patient care or supporting facilities. A CPW concentrates on three dimensions: diagnosis, which means patients' disease; treatment, which means the manner in which patients are treated—whether medically or surgically; and prevention, which means to avoid an injury or disease (Mater and Ibrahim, 2014). A CPW provides guidance for every diagnostic examination and therapy that a doctor needs to provide (Mammen, Matsell and Lemley, 2013). The right choice of diagnostic examination and therapy could improve clinical outcomes for patients. This is one of the reasons for hospitals to implement the CPW. However, the CPW should not be viewed as a "cookbook" for health care with prescriptive step-by-step instructions, but rather as a set of evidence-based activities and interventions developed for a specific user group.

The important element is successful interprofessional collaboration, which is carried out continuously between the health care team and patients (Asmirajanti *et al.,* 2018). The implementation of a CPW requires collaboration among doctors, nurses, and other health care professionals. A CPW is utilized as a medium for communication between the health care team and patients (Mammen, Matsell and Lemley, 2013). The CPW should clearly delineate the elements of care specific to each discipline or role, so

that there is a structured plan of care to be enacted by each member of the health care team (Buchert and Butler, 2016). Effective communication is a key in implementing interprofessional collaboration to improve the quality of health services (Asmirajanti *et al.,* 2018). Interprofessional collaboration must be implemented transparently and evaluated continuously by the management of health.

Implementation of the CPW has a direct effect on health service quality and patient safety (Buchert and Butler, 2016). Health service quality can be improved by implementing a CPW (Mater and Ibrahim, 2014). Fewer complications can occur in some cases of diseases when a CPW is implemented in hospitals (Aniza *et al.,* 2016). The implementation of a CPW can reduce readmission rates and health service costs (Buchert and Butler, 2016), and even increase the patients' satisfaction (Cudre *et al.,* 2016; Wetherill *et al., et al.,*2016). Patients feel satisfied and safe as doctors can explain the details of care given to patients as stated in the CPW (Cudre *et al.,* 2016). Patients' safety can also be improved by implementing a CPW (Asmirajanti *et al.,* 2018). Implementing a CPW can reduce the incidence of health care-associated infection since it can reduce patients' length of stay (Asmirajanti *et al.,* 2018). Furthermore, a CPW can improve internal hospital efficiency and effectiveness (Mater and Ibrahim, 2014).

Length of stay is one of the outcome indicators utilized to evaluate the effects of a CPW (Bai *et al.,* 2018). Hospital costs and complications could be utilized to measure the cost-effectiveness of the CPW. Length of stay can be reduced when hospitals implements a CPW, for example, in stroke patients (Fujino *et al.,* 2014). Prolonged hospitalization is often accompanied by health care-associated infections (*et al.,*Elliott and Justiz-Vaillant, 2018; Haque *et al.,* 2018). The term health care-associated infections initially referred to infections linked with admission to an acute-care hospital (previously called nosocomial infections); however, it now includes infections developed in various settings where patients obtain health care (e.g., long-term care, family medicine clinics, home care, and ambulatory care). Health care-associated infection leads to extra costs for patients and can prolong the length of stay (Baek *et al.,* 2018; Schmier *et al.,* 2016*et al.,*).

A retrospective cohort study found that compliance with the CPW is associated with length of stay and cost of services (Bryan *et al.,* 2019). In this study, the researchers aimed to evaluate the effect of compliance with a standard CPW on health care use and costs in the pediatric emergency department and inpatient settings. The result was the higher the compliance with the CPW, the lower the health service cost and the shorter the length of stay. Diagnostic examination compliance and therapy compliance are included in criteria for compliance with the CPW.

Source: Audit Data of One Private Hospital in Surabaya in 2017

Figure 1. Average Length of Stay for Acute Gastroenteritis Pediatric Patients in 2017

In one of the private hospitals in Surabaya, the average length of stay for pediatric acute gastroenteritis cases in

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Published by Universitas Airlangga
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2017 was more than 5 days. The length of stay continued to increase every month, as shown in Figure 1. Data shown in Figure 1 were collected from audit data collected by the CPW team in the hospital. The data show that the length of stay was longer than the average length of stay for pediatric acute gastroenteritis cases in 2016, which was 4 days. The average length of stay for acute gastroenteritis pediatric patients is described as prolonged if the length of stay is more than 4 days (Guarino *et al.,* 2014). This study aimed to determine the diagnostic examination compliance and therapy compliance with the CPW related to length of stay. If compliance with the CPW is related to length of stay, it will be easier to decide what steps must be taken by the hospital management and medical board to improve the clinicians' compliance.

METHODS

This study was observational cross-sectional research. It was conducted in one of the private hospitals in Surabaya in September and October 2019. The population was pediatric patients who were admitted between January and December 2018 with acute gastroenteritis. The age range for pediatric patients was 1 month to 15 years. Following the inclusion criteria, 455 cases were admitted during that period.

$$n = \left[\frac{Z_\alpha + Z_\beta}{\frac{1}{2}\ln\left(\frac{1+\rho}{1-\rho}\right)}\right]^2 + 3$$

$Z\alpha$ = the standard normal deviation for two-tailed α (α = 0.05)
$Z\beta$ = the standard normal deviation for β (β = 0.20)
ρ = expected coefficient correlation.

Researchers calculated the sample that needed to be collected by utilizing Hulley et al.'s formula (Hulley *et al.,* 2013). According to this formula, the minimal sample for this research was 194 cases. Researchers utilized simple random sampling to obtain the sample for this research. In this study, the independent variables were diagnostic examination compliance and therapy compliance, and the dependent variable was length of stay. The hypothesis in this study was that diagnostic examination compliance and therapy compliance have an effect on reducing length of stay.

Researchers collected data from CPW forms that were completed by doctors, nurses and other health care professionals in the medical records department. Ten pediatricians were evaluated on completing CPWs. The inclusion criteria were every case admitted with acute gastroenteritis between January and December 2018 and the CPW forms were completed fully by doctors, nurses and other health care professionals. Forms that were not completed fully were excluded since it was difficult to determine whether every diagnostic examination stated on the CPW form was performed by doctors or not. Of the 215 cases collected, 18 cases were excluded as the forms were not completed fully by doctors, nurses, and other health care professionals. Researchers collected data on diagnostic examination compliance and therapy compliance from the CPW forms. Researchers did not collect personal data and medical record numbers in this research. Researchers renamed every patient with an alphabetical code, such as A, B, C. Ethical approval for this study was obtained from the Ethics Committee of the Faculty of Public Health of Universitas Airlangga with the ethics code 617-KEPK.

Researchers measured the compliance by checking all diagnostic examinations and therapy that were given to the patient and compared it with the standards of diagnostic examination and therapy stated on the form. If one or more

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diagnostic examination or therapy was not stated on the form, the case/s would be categorized as no compliance, and vice versa. Researchers calculated the length of stay for every case by substracting duration at the time the patient was admitted to the hospital with duration of their treatment and administration at the hospital.

After the data were collected, researchers analyzed the data utilizing correlation analysis. The data collected on diagnostic examination compliance and therapy compliance were nominal data. Compliance was stated as 1 and no compliance was stated as 0 for the data. The length of stay was continuous data. Researchers did not include the medical record numbers and patients' data in the inputted data. Researchers performed descriptive statistical analysis for every variable, and then proceeded with the statistical analysis. Multiple classification analysis, non-parametric statistical analysis, was performed to determine the relationship between diagnostic examination compliance and therapy compliance and length of stay. The descriptive and correlation statistical analyses were performed utilizing SPSS 25.

RESULTS AND DISCUSSION

There were 197 patients whose CPW form was completed fully. After the data were collected, it was found that 60.91% of cases complied with the diagnostic examination as stated in the CPW form. The compliance for diagnostic tests was lower than the therapy compliance, which was 88.32%. The compliance data are shown in Table 1.

Table 1. Diagnostic Examination Compliance and Therapy Compliance during the Period January–December 2018

Month	Compliance of Diagnostic Examination				Compliance of Therapy			
	Yes		No		Yes		No	
	n	%	n	%	n	%	n	%
January	15	57.69	11	42.31	26	100.00	0	0.00
February	14	63.64	8	36.36	18	81.82	4	18.18
March	15	68.18	7	31.82	18	81.82	4	18.18
April	7	53.85	6	46.15	10	76.92	3	23.08
May	3	30.00	7	70.00	8	80.00	2	20.00
June	2	16.67	10	83.33	10	83.33	2	16.67
July	2	25.00	6	75.00	7	87.50	1	12.50
August	7	41.18	10	58.82	17	100.00	0	0.00
September	3	75.00	1	25.00	3	75.00	1	25.00
October	21	87.50	3	12.50	23	95.83	1	4.17
November	19	73.08	7	26.92	21	80.77	5	19.23
December	12	92.31	1	7.69	13	100.00	0	0.00
Total	120	60.91	77	39.09	174	88.32	23	11.68

The highest compliance for diagnostic examination can be found in December, while the lowest can be found in June. The diagnostic examination compliance was never 100%. This result was different to the therapy compliance

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result. In January, August and December, the compliance for therapy was 100%. The lowest percentage for therapy compliance can be found in September at 75.00%. Researchers can therefore conclude that the compliance for therapy was better than that for diagnostic examination.

A standard was set for length of stay for pediatric acute gastroenteritis, which is 4 days. The standard was set from the analysis of the average length of stay for acute gastroenteritis cases in pediatric patients in 2016. Every year, the hospitals' medical board reviews all standards, guidelines, and CPWs, especially for average length of stay. In addition, in 2018, the hospitals' medical board decided that the average length of stay for pediatric acute gastroenteritis was 4 days.

The collected data showed that there were many variations in length of stay. Descriptive analysis of length of stay was performed, and the data are shown in Table 2 and Table 3. The descriptive analysis data showed that the average length of stay from the diagnostic examination compliance variable and the therapy compliance variable was less than 4 days. This was less than the standard set for the CPW. There was no big difference between the average length of stay for compliant cases and non-compliant cases for the diagnostic compliance variable and the therapy compliance variable.

The length of stay for cases with no compliance in diagnostic examination was better than cases with compliance. However, it was different if researchers compared it with the therapy compliance variable. Cases that complied with therapy were better than those without compliance. Researchers found that the maximum length of stay in this study was 7 days. From the descriptive data, researchers could conclude that there was no association between diagnostic examination compliance and therapy compliance and length of stay. This result was different to the conclusion of a previous study. For bronchiolitis cases, researchers found a shorter length of stay in cases with higher compliance with the CPW (Bryan *et al.,* 2019).

Later, researchers performed statistical analysis to determine the correlation between diagnostic examination compliance and therapy compliance and length of stay. Researchers used multiple classification analysis and inputted the data into the formula in SPSS 25. The results of the statistical analysis are shown in Table 4. The statistical analysis results were similar to the results of the descriptive analysis. There was no statistically significant correlation between diagnostic examination compliance of the CPW with patients' length of stay ($p > 0.05$). Therapy compliance showed the same result for the statistical significance ($p > 0.05$). Even when the diagnostic examination variable and the therapy variable were combined and analyzed statistically, they showed the same result (combined = $p > 0.05$). The higher compliance of diagnostic examination and therapy did not have any effect on the length of stay in pediatric acute gastroenteritis cases. This result was the opposite of the result in the studies of Kaiser et al. (2018) and Bryan et al. (2019).

In this cross-sectional study, researchers aimed to examine the correlation between diagnostic examination compliance and length of stay and between therapy compliance and length of stay. Some research projects showed that there was correlation between CPW compliance and length of stay. Compliance with the CPW was related to length of stay (Bryan *et al.,* 2019). Bryan et al. conducted a retrospective cohort study to examine the correlation between CPW compliance and healthcare costs, length of stay, and inpatient readmission. They utilized the Pediatric Respiratory Illness Measurement

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System (PRIMES) quality indicator to determine the compliance score of the CPW. Diagnostic examination compliance and therapy compliance were included in those indicators. In this research, they found shorter length of stay and lower cost for higher compliance with the CPW. It can be concluded that there was correlation between compliance with the CPW and length of stay and health care cost. However, in this study, researchers stated that they were unable to control variables that may have affected the time of discharge. Researchers suggested that parental anxiety can be one of the reasons for prolonged length of stay. Patients' comorbidity and illness severity were the variables that could not be controlled by researchers in their study, especially illness severity, which could affect the length of stay.

Table 2. Descriptive Analysis of Data for Length of Stay and Diagnostic Compliance Variable

Description						
	Diagnostic Compliance		**No Compliance**		**Compliance**	
			Statistic	**Std. Error**	**Statistic**	**Std. Error**
Length of stay	Mean		3.3506	.11510	3.4083	.07623
	95% Confidence Interval (CI) for Mean	Lower Bound	3.1214		3.2574	
		Upper Bound	3.5799		3.5593	
	5% Trimmed Mean		3.3052		3.3981	
	Median		3.0000		3.0000	
	Variance		1.020		.697	
	Std. Deviation		1.01003		.83511	
	Minimum		1.00		2.00	
	Maximum		7.00		5.00	
	Range		6.00		3.00	
	Interquartile Range		1.00		1.00	
	Skewness		.657	.274	−.100	.221
	Kurtosis		1.562	.541	−.610	.438

The correlation between compliance with the CPW and length of stay was proven in another research project. Compliance with the CPW can reduce the length of stay, pain intensity, surgical site infection incidence, and total real cost of caesarian section patients (Haninditya *et al.,* 2019). This study was conducted at a type C private hospital in Yogyakarta. The variables were analyzed by a Chi square test and non-parametric regression test. All the statistical tests showed that there was correlation between CPW compliance and all variables of patient outcomes (length of stay, pain intensity, surgical site infection incidence, and total real cost of caesarian section). From this research, researchers concluded that compliance with the CPW is important to reduce the length of stay and improve patients' clinical outcome. In this study, researchers stated that there were some limitations. One of the limitations was that they could not control external factors such as physical factors of patients that can affect patients' outcome, especially their length of stay.

A multicenter cohort study was conducted to evaluate the effectiveness of

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the pediatric asthma CPW for hospitalized children (Kaiser *et al.,* 2018). Researchers utilized the Pediatric Health Information system as their database. They utilized generalized estimating equations (GEEs) with an interrupted time series approach to determine the correlation between implementation of the CPW and patients' outcome, especially length of stay. This study was different to another study, especially in terms of the time period when they conducted the outcome analysis. Many studies performed their evaluation for the outcome over a shorter time period of 6−12 months after the implementation. This study focused on longer-term sustained effects. The study result was, as researchers expected, that there was a correlation between CPW compliance and length of stay. They found that the reduced length of stay in the existing CPW implementation was greater than in the new version of CPW implementation.

Table 3. Descriptive Analysis of Data for Length of Stay and Therapy Compliance Variable

Description						
	Therapy Compliance		**No Compliance**		**Comply**	
			Statistic	**Std. Error**	**Statistic**	**Std. Error**
LOS	Mean		3.3913	.20603	3.3851	.06800
	95% CI for Mean	Lower Bound	2.9640		3.2508	
		Upper Bound	3.8186		3.5193	
	5% Trimmed Mean		3.3792		3.3595	
	Median		3.0000		3.0000	
	Variance		.976		.805	
	Std. Deviation		.98807		.89701	
	Minimum		2.00		1.00	
	Maximum		5.00		7.00	
	Range		3.00		6.00	
	Interquartile Range		1.00		1.00	
	Skewness		.021	.481	.326	.184
	Kurtosis		−.944	.935	.934	.366

Another research study focused on compliance with antibiotic treatment and proved that compliance was related to shorter length of stay (Wathne *et al.,* 2019). This study was an observational cohort study conducted for five months across three university hospitals in Western Norway. It was a multicenter study, which could increase the generalizability of the results. Researchers utilized national guidelines as their standard for antibiotics treatment. A Chi square test and a two-sample t-test were utilized to analyze the correlation between guideline-adherent prescribing practice and patient outcome. The result was the same as that of Bryan et al.'s research that length of stay was shorter for the guideline-adherent group than the non-adherent group.

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Table 4. Correlation between Diagnostic Examination Compliance and Therapy Compliance and Length of Stay

ANOVA[a]

			Hierarchical Method				
			Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
LOS	Main Effects	(Combined)	.162	2	.081	.098	.907
		Diagnostic Examination Compliance	.156	1	.156	.188	.665
		Therapy Compliance	.006	1	.006	.008	.930
	2-Way Interactions	Diagnostic Examination Compliance Therapy Compliance	.114	1	.114	.137	.711
	Model		.277	3	.092	.111	.954
	Residual		160.404	193	.831		
	Total		160.680	196	.820		

Notes: Length Of Stay (LOS) by diagnostic examination compliance and therapy compliance

A systematic review was conducted to determine whether CPW guidelines were related to shorter length of stay (Ellen *et al.,* 2017). Researchers conducted semi-structured interviews with staff from nine hospitals whose jobs involved developing, implementing, monitoring, updating, or evaluating CPW guidelines. They showed that there were five main factors affecting the relationship between CPW guidelines and length of stay. The factors were the purpose of implementation, evidence base for CPW guidelines' content and selection, health care professionals' response to change and compliance, dissemination of strategies, and organizational support and resources. The second factor could be one of the reasons for the unexpected result in this research. Researchers suggested that once a CPW guideline is adopted, it needs to be evaluated and updated regularly. Some participants in this research stated that while the organization needs to conduct an annual or bi-annual review, it is not always done and is usually an ad hoc process. In this study, researchers stated that the pediatricians that were observed suggested that CPW forms need to be reviewed, especially the diagnostic part.

In this study, researchers found an unexpected result. The study showed that there was no correlation between CPW compliance and length of stay. This result was the same as that obtained by Lifland et al. (2018). They conducted the same research on a different population to determine the correlation between level of compliance and length of stay, cost, and readmissions (Lifland *et al.,* 2018). The population was patients who were eligible for the Adolescent Depressive Disorders Clinical Pathway admitted to a pediatric tertiary care facility between January 1, 2014, and May 31, 2015. The level of compliance was measured by comparing the processes of care with the standard electronic form that was stored in an internal Psychiatry and Behavioral Medicine Unit (PBMU) database. The study findings showed that there was no

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association between level of compliance and length of stay. The higher the compliance level with the CPW, the longer the patient stays. In this study, the prolonged length of stay could have occurred as time is needed to complete every module of therapy for the patients. The clinician needed a longer length of stay since they needed to finish a module to assess and treat the patient. Lifland et al. stated that the CPW may improve another clinical outcome that was not measured in those studies, such as inpatient readmission. However, in this study, acute gastroenteritis did not need time for the therapy to completed, unlike Lifland et al.'s study where psychotherapy needed to be completed.

There may be other factors that could affect the result of this study, such as greater illness severity. This limitation could be found in Carson et al.'s study (2017). Their research was a prospective quality improvement project to implement a CPW for acute gastroenteritis in pediatric patients initiated by a nurse. Researchers compared two groups, with and without the intervention, and measured the resource reduction in this research. They found that there were statistically significant lower rates of resource use, such as inappropriate intravenous fluid, laboratory studies and imaging studies. However, in this study, they still found prolonged length of stay in both groups. They stated that illness severity could have had an impact on length of stay.

Although the finding of this study demonstrates that there was no correlation between CPW compliance and length of stay, CWP compliance can improve the unmeasured outcomes in this study. CPW compliance can reduce mortality for inpatients (Opoka *et al.,* 2019). Researchers conducted this study to evaluate the relationship between clinical care factors, especially clinical guideline adherence, and inpatient deaths. The compliance was measured by the principles used in the development of the Pediatric Admissions Quality of Care (PAQC) score. Researchers showed that compliance with clinical guidelines reduced inpatient mortality in children with suspected SA by 72%. Reduced inpatient mortality associated with compliance with clinical guidelines was found by other researchers (*et al.,*Marincowitz *et al.,* 2019; Ahmed *et al.,* 2017; Komajda *et al.,* 2017).

A retrospective cohort study showed that guideline compliance for serial evaluation in patients with asymptomatic severe aortic stenosis can reduce all-cause mortality (Ahmed *et al.,* 2017). In this study, there was no difference in age, race/ethnicity, sex, comorbidities, insurance status, left ventricular function, and aortic stenosis severity between patients with and patients without guideline compliance. Patients without guideline compliance had higher rates of death (hazard ratio [HR], 1.57; 95% CI, 1.07–2.30; $p < 0.001$), myocardial infarction (HR, 1.87; 95% CI, 1.00–3.49; $p = 0.04$), and stroke (HR, 1.94; 95% CI, 1.02–3.71; $p = 0.04$). Patients with greater compliance may benefit from early identification of indications for surgical intervention, which is well known to be a life-saving therapy for severe aortic stenosis. However, the limitation of this study was the nonrandomized sampling, which can create bias in generalizing the conclusion to the population.

An interrupted time series analysis study was conducted to evaluate the effectiveness of the implementation of head injury guidelines (Marincowitz *et al.,* 2019). In this study, researchers utilized complete Office of National Statistics cause of death data linked to hospital episode statistics for inpatient admissions in England. The data analysis was stratified into specific age groups (0–15 years, 16–64 years, and 65+

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years). The result showed that there were reduced mortality rates for the first and second groups but not for the third group. There were increased admission rates and mortality rates, but researchers assured that those were unaffected by implementation of the guidelines.

An international, prospective, observational, longitudinal survey was conducted in 36 countries to evaluate clinical guidelines for heart failure with reduced ejection fraction (Komajda *et al.,* 2017). Patients who participated in surveys were followed up after 6 months for their outcome to be evaluated. At the 6-month follow-up, poor compliance was correlated with significantly higher overall mortality, increased cardiovascular mortality, and heart failure mortality. It showed that there was a strong correlation between poor compliance and heart failure hospitalization (HR 1.32; 95% CI 1.04–1.68; p = 0.069). However, researchers realized that the population for this study were relatively young and may not represent the overall profile of heart failure in elderly patients.

Many studies showed another outcome that could be evaluated for CPW compliance. Researchers realized that there were some limitations in this study. Therefore, further investigation is required, especially for other clinical outcomes. Other clinical outcomes such as mortality rates, total health care cost and readmission rate could be measured in the future research. Other factors such as illness severity that could affect the length of stay should be assessed and categorized. Another limitation of this study was the limited population. This study was conducted only at a single institution, which may limit the generalization of results. However, the institution utilized in this study was probably representative of another general hospital because of the number of patients and referrals. Researchers hope that the next research study can be conducted at more than one hospital and across another district. This study did not utilize validated tools to measure compliance with CPW. However, it proved that reviewing CPWs was important when implementing a CPW to increase CPW compliance.

CONCLUSION

Compliance with the CPW did not have any correlation with length of stay, especially for diagnostic examination compliance and therapy compliance, in this study. However, many factors can be related to the length of stay, especially patients' condition. The content of the CPW form needs to be reviewed every year. This study contributes to the limited existing literature on CPW compliance and its outcomes. Researchers recommend that future studies should examine another outcome related to CPW compliance.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest for this article.

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.65-78

ORIGINAL RESEARCH

FAMILY PLANNING VILLAGE PROGRAM IN RESPONSE TO THE USE OF LONG-TERM CONTRACEPTIVE METHOD

Program Kampung Keluarga Berencana dalam Merespon Penggunaan Kontrasepsi Jangka Panjang

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ABSTRACT

Background: Contraceptive use in Indonesia was still dominated by short-term contraception. Thus, Family Planning Village is created for promoting a Long-Term Contraception Method (LTCM).
Aim: This study analyzed the implementation of the Family Planning Village Program for LTCM use in Dukuhsia Rambipuji, Jember.
Method: This study was descriptive with a mixed-method approach. All of LTCM users in Dukuhsia amounting to 24 participated in the quantitative study. While there were five informants who were selected purposively in the qualitative research, including a Family Planning field worker, Coordinator of Women Empowerment, Child Protection and Family Planning Office, a midwife, Advocate Assistant for Village Family Planning, and a cadre under the Advocate Assistant for Village Family Planning. Qualitative data were obtained through in-depth interviews while quantitative data through structured interviews using questioner. Data were then analyzed using the Miles and Huberman Models and statistical-descriptive analysis.
Results: Most aspects of the input factor were not in accordance with the technical guidelines of Family Planning Village. Whereas the implementation method complies with the guidelines. Most aspects of the process factor were relevant to the guidelines, but there were still many obstacles in the implementation. Good participation in the family planning village program is only 37.5%. Since the program launch, the prevalence of long-term contraceptive use increase from 6.07% to 6.21%. However, it does not significantly increase the use of LTCM because the prevalence was much smaller than the prevalence of LTCM at the village level.
Conclusion: The implementation of the Family Planning Village in Dukuhsia could increase LTCM users. However, it could not increase the ideal proportion of LTCM users. Therefore, it is necessary to improve input and process of the Family Planning Village through the Contraceptive Technology Update (CTU) training for midwives and conduct a training of LTCM use for cadres to enhance their communicative skill in campaigning the use of LCTM.

Keywords: users, contraception, family planning village, implementation.

ABSTRAK

Latar Belakang: *Penggunaan metode kontrasepsi di Indonesia didominasi oleh kontrasepsi jangka pendek. Oleh karena itu, pemerintah merintis program kampung KB sebagai salah satu upaya promosi peningkatan penggunakan Metode Kontrasepsi Jangka Panjang (MKJP).*
Tujuan: *Penelitian ini bertujuan untuk menganalisis implementasi Program Kampung KB terhadap penggunaan Metode Kontrasepsi Jangka Panjang (MKJP) di Dukuhsia Rambipuji Jember.*
Metode: *Jenis penelitian ini adalah deskriptif dengan metode campuran (mixed method). Responden untuk penelitian kuantitatif adalah seluruh pengguna MKJP di Dukuhsia yang berjumlah 24. Adapun informan untuk penelitian kualitatif sebanyak 5 orang yang ditentukan secara purposive, yaitu Petugas Lapangan Keluarga Berencana (PLKB), Koordinator Dinas Pemberdayaan Perempuan, Perlindugan Anak dan Keluarga Berencana (DP3AKB), bidan, Pembantu Pembina Keluarga Berencana Desa (PPKBD), dan kader Sub PPKBD. Data kualitatif diperoleh melalui wawancara sedangkan data kuantitatif diperoleh melalui wawancara terstruktur menggunakan kuesioner. Data kemudian dianalisis menggunakan Model Miles dan Huberman dan analisis statistik-deskriptif.*
Hasil: *Sebagian besar aspek input belum sesuai dengan pedoman teknis Kampung KB, hanya aspek metode yang sudah sesuai dengan pedoman. Sebagian besar aspek proses sesuai dengan pedoman tetapi masih ada banyak hambatan implementasi. Partisipasi yang baik dalam program Kampung KB hanya 37,5%. Sejak program Kampung KB diluncurkan, prevalensi MKJP meningkat dari 6,07% menjadi 6,21%, tetapi belum meningkat secara*

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Published by Universitas Airlangga
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ignifikan karena prevalensinya sangat kecil dibandingkan dengan prevalensi MKJP di tingkat desa.
Kesimpulan: *Implementasi program kampung KB di Dukuhsia dapat meningkatkan jumlah akseptor MKJP, namun kenaikan tersebut belum mampu meningkatkan proporsi MKJP kampung KB secara signifikan. Dengan demikian perlu perbaikan pada aspek input dan proses pengelolaan Kampung KB melalui pelatihan Contraceptive Technology Update (CTU) untuk bidan dan memberikan pelatihan bagi kader untuk meningkatkan kemampuan berkomunikasi dalam mengkampanyekan penggunaan MKJP.*
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Kata kunci: *pengguna, kontrasepsi, kampung keluarga kerencana, implementasi.*

Received: 2 February 2020 ***Accepted: 29 April 2020*** ***Published: 29 May 2020***

INTRODUCTION

Indonesia still faces several issues related to family planning and reproductive health, which can weaken the implementation of the Family Planning and Family Development Population program (National Board of Population and Family Planning, 2015). Family Planning Program, according to Law No. 52 of 2009, is defined as an effort to regulate childbirth, pregnancy span, and ideal age for childbirth through promotion, protection, and assistance in accordance with the reproductive rights for excellent families. The World Health Statistics reported data from 2005-2012 that the use of contraception in Indonesia has exceeded the average compared to other ASEAN countries but is still lower than in Vietnam, Cambodia, and Thailand. The data of Family Planning Worldwide in 2008 showed the number of fertile aged women in Indonesia is the highest among other ASEAN countries around 65 million fertile women. In other words, it still increases the number of Contraceptive Prevalence Rate (CPR) (Indonesian Ministry of Health, 2013).

The contraceptive methods, according to the period of use, are divided into two ways; the long-term contraceptive method, and the short-term contraceptive method. The most effective way for reducing birth rates is a long-term contraceptive method. Long-term contraception can be used for an extended period time (more than two years) and are practical and efficient for the birth spacing of more than three years or birth control for couples who do not want to have more children. Types of long-term contraception are male and female regular contraception (tubectomy and vasectomy), Implant and Intra-Uterine Device (IUD) (National Board of Population and Family Planning, 2016).

Based on data from the East Java Provincial National Population and Family Planning Board in 2017, it was found that the coverage of active family planning participants in East Java Province reached 74.39% (East Java Provincial National Board of Population and Family Planning, 2017). This coverage rate increased compared to that in 2016, which reached 68.79%. Whereas, the coverage of new family planning participants decreased in 2015 from 10.6% to 10.4% in 2016 (East Java Provincial Health Office, 2017). Family planning participation in Indonesia is still dominated by the use of short-term contraception, such as the injection method (58.4%) and pill (17.3%). According to the Regency/City of East Java Province in 2015, the long-term contraception in Jember District was ranked as the 8th lowest percentage. However, the proportion of new family planning participants that use long-term contraception in Jember District was ranked as the tenth lowest (East Java Provincial Health Office, 2015). Based on these data, it is known that the use of short-term contraception is higher than long-term contraception. However, Couple Years of Protection (CYP) during 3-5 years give a small opportunity for discontinuing the use of contraception (0-20%) compared to short-term contraception method (20-40%). CYP is

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.65-78

estimated protection from pregnancy given contraception for one year (Indonesian Ministry of Health, 2013).

Short-term contraceptive methods in Jember District are more dominated, while the use of long-term contraceptives methods was deficient. The number of vasectomies used was 1.1%, and the use of tubectomy was 1.5% (Jember District Health Office, 2016). The long-term contraceptive method is not preferred much because the short-term contraceptives are more affordable and easy to use (Jember District Health Office, 2014).

The Population in Indonesia is very complex, and society still opts the short-term contraceptives, which in turn need special treatment. Because of that, the government initiated the Family Planning Village Program, which aims to achieve the development priority (Nawacita) from 2015 to 2019. The Family Planning Village strengthens the Family Planning Population and Family Empowerment Program, which is managed and organized from, by, and for the community. It facilitates the city with family planning services. The Family Planning Services involve Community Villages, Orchards, or equivalent regional units, which integrate the population programs, family planning, family empowerment, and other related empowerments (National Board of Population and Family Planning, 2015). Family planning programs in Jember District were firstly implemented in Dukuhsia, Rambigundam Village, in March 2016 because it had a small number of long-term contraception. However, after the program was implemented, the increase in the number of long-term contraceptive users did not meet the target. Based on the issues, this study pointed out how the Family Planning Village Program was implemented to increase the use of long-term contraceptive methods in Dukuhsia, Jember, in 2017.

METHOD

This research was descriptive using a mixed-method approach with a sequential exploratory design, which explored the data qualitatively and quantitatively (Sutopo, 2014). This study was conducted from June until August 2018. The first stage of this study used a qualitative approach. There five informants were selected purposively, such as a Family Planning field worker, Coordinator of Women Empowerment, Child Protection and Family Planning Office, a midwife, Advocate Assistant for Village Family Planning, and a cadre under the Advocate Assistant for Village Family Planning. The qualitative data were obtained through in-depth interviews and supported by the documentation of the Family Planning Village Program in Dukuhsia. The secondary data at the qualitative stage included documents related to inputs (man, money, materials, methods, facilities and infrastructure and targets) and process (duration of meetings, mini-workshops, community village meeting, and documentation). This study analyzed qualitative data using the Miles and Huberman Models. This model analyzed qualitative data interactively, continuously until the data-saturated with the stages of data reduction, data display, and concluding.

While at the second phase this study used a quantitative approach which involved all of LTCM users as many as 24 repsondents in Dukuhsia. Variables examined at this stage were knowledge of LTCM, participation of family planning, family planning service, distance, and travel time to access family planning services. Knowledge variable was divided into three categories, i.e., good if the respondents answered >8 questions

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correctly, moderate if the respondents had 6-8 correct answers, and less if they got ≤ 5 correct answers. Participation in the family planning village program was categorized into three, i.e., good if the respondents answered "yes" to >8 statements, moderate if they answered "yes" to 6-8 statements, and less if they answered “yes” to ≤ 5 statements.

This study also measured access variables consisting of distance and travel time to the LTCM services. Distance is a physical length that the respondentd have travelled from home to the LTCM services. It was classified into 3 criteria, which were ≤ 3 km, 3 – 15 km and ≥ 15 km. Travel time is the length of time spent to travel from home to the LTCM services in minutes as the unit of measurement. Travel time was grouped into 3 categories, such as ≤ 10 minutes, 10 – 30 minutes and ≥ 30 minutes.

The quantitative data were collected through structured interviews with question guidelines and documentation of the target reports of long-term contraception program and users in Dukuhsia. The quantitative data were then analyzed by using univariate analysis and explained descriptively.

RESULTS AND DISCUSSION

The Input of Family Planning Village Program

Input is data put into a system or extended into action to achieve an output or result. Information refers to resources needed for implementing an activity or intervention. Human resources, materials, and financial resources are input indicators. Human resources were related to respondents’ and program implementers’ characteristics.

Respondents’ characteristics consist of sex, age, education level, and income. It was found that the respondents were all women (100%) since there were no males who used a vasectomy method. A husband or male respondent is an indicator of the success of the Family Planning Program. The stigma about female participants in the family planning program commonly makes the majority of males unwilling to participate. Moreover, males acknowledge that the Family Planning Program was carried out by mostly female workers. Such a social problem that perceives a wrong concept of contraception causes limited access for husbands to understand it (Muhatiah, 2012).

The respondents are mostly at the age of <40 years and 40-50 years. It was noticed that generation tends to affect the choice of contraceptives. Respondents aged 30 tend to choose long-term contraceptives compared to respondents where less than 20 years old (Lontaan, Kusmiyati, and Dompas, 2014). The older the age of the respondent, the more likely they use long-term contraception (Dewi, 2017).

Most of the respondents have graduated from junior high school/equivalent, and some have graduated from high school/equivalent. Respondents with higher education have a broad view of something, and it is easier to accept ideas or inputs (Rosmadewi, 2015). Education can affect one's understanding of various things and become a foundation in preparing, forming, fostering, and developing resources (Yanti, Hasballah, and Mulyadi, 2016).

The dominant occupations of the respondents are entrepreneurs. Others have no work and are farmers, laborers, and civil servants. They mostly have income below the regional minimum wages. Respondents who are in middle and lower economic status prioritize primary needs other than contraceptives. Therefore, they prefer to use short-term contraception, such as pills and injections,

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which are cheaper (Murniati, Astuti, and Juliantari, 2016).

In organizing the Family Planning Village, females at the age of 30-50 years take more control. Females at this age are considered capable of self-development and community empowerment. In general, they have the ability to perform the program well (Devi, Fatchiya, and Susanto, 2016).

Characteristics of program implementers consist of gender, age, education level and years or working. The program implementer is an organizational component that carries out tasks that have been determined from above. The executor is the person who is assigned to carry out the management as well implement programs to achieve organizational program goals. The role of program implementers is very important in the success of the program. Program implementers in this study were a Family Planning field worker, Coordinator of Women Empowerment, Child Protection and Family Planning Office, a midwife, Advocate Assistant for Village Family Planning, and a cadre under the Advocate Assistant for Village Family Planning.

Most of the implementers are female. The composition of the age of the implementing family planning village is 30-50 years. This age group is still productive for self-development and the development of family planning programs. In general, implementers in this age group have the ability to move that is still quite good. This is a potential in family planning counselling. Females who organize the Family Planning Program have various educational levels from school to college level. High knowledge, positive attitudes, and top skills will make them more adaptive to change, able to overcome problems well, plan and evaluate work appropriately (Devi, Fatchiya, and Susanto, 2016).

The Family Planning Program in Dukuhsia Village began on March 22, 2016, so some of the implementers had a two-year working period. The working period is an indicator of productivity because people have more experience and skills in completing tasks (Yanti and Hasballah, 2016).

In terms of funding, the Family Planning Village Program was sponsored by the State Budget, Provincial National Population, and Family Planning Board, Local Government Work Unit, Regional Government Budget, Village Budget, or other related sectors. However, the Family Planning Program in Dukuhsia did not receive any funding.

> *"The first program was implemented in Dukuhsia and Tanggul. Tanggul becomes the comparison, but Dukuhsia is the main implementer. Someone said the Family Program in Dukuhsia was funded by the Government, but until now they got nothing. Instead, the Family Planning Program in Rambipuji was divided into two funding streams. The new Family Planning Program is funded using the assistance fund for operational cost (BOK), but the old program is always self-funded…"* (Family Planning Field Worker)

One indicator of success in the Family Planning Village Program is the integrated activities among cross-sectoral partners. The budget support for the program implementation comes from Regional Government Budget I, Regional Government Budget II, Village Budget as well as other non-binding funds (National Board of Family Planning and Population, 2016). Practically, the Family Planning

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Village Program in Dukuhsia was never offered funding. Funding for family planning activities in the village only comes from external partners. As a result, the cadres did not get any commission for implementing the Family Planning Village Program. Therefore, the Coordinator of Jember Women Empowerment and Child Protection gave commission for cadres in every activity of Family Planning Program. Cadres helped Advocate Assistants for Village Family Planning and usually got reward of IDR 150,000 for attending every activity.

> *"There are Advocate Assistant for Village Family Planning and the cadre of Advocate Assistant for Village Family Planning. So far they have never received honorarium unless there are activities. The Advocate Assistant for Village Family Planning will get 150,000 Rupiah even bigger, such as three or four million in a year. However, they just took 50,000 Rupiah, and the rest was given to the cadred who helped them. If the activity is conducted in the village hall or anywhere, the cadres will get 10,000-15,000 Rupiah for transportation fare."* (Coordinator of Women Empowerment, Child Protection and Family Planning Office)

In addition to commission, the Family Planning Village Program should be supported by decent facilities and infrastructure especially contraceptives, medical devices for the installation of contraception, counselling, media for Family Planning Population and Family Empowerment and service cars. Based on the interviews, it was said that facilities and infrastructure for the Family Planning Village in Dukuhsia are still not fully complete. However, the Village provides free long-term contraceptives. Improving facilities for the program will create a conducive working atmosphere so that work can be completed effectively and efficiently (Afniyanti, 2016).

To increase the users of long-term contraceptives, the program provides free for contraceptives services, counselling, and socialization. Free for contraceptive services is held by cross sectors such as Indonesian Midwives Association, polices, and soldiers. The socialization of Family Planning Program was conducted in integrated service post, and Family Welfare Program. If socialization or counselling is in a group, it will be more about interpersonal communication (Afniyanti, 2016).

The target society expected to participate in the Family Planning Program are couples at childbearing age. Fertile couples are directed to become active cadres so that they are knowledgeable about the issues of population. It is expected that they can contribute to increase the number of long-term contraceptive users as the Government has set.

The Process of Family Planning Village Program

The process of the Family Planning Village Program begins with planning stage. At this stage, the implementers plan activities during a year ahead. Nevertheless, there are some incidental activities that arise outside the initial planning. The planning activities are quarterly held usually in pre-schools, village head's house, and program treasurer's house. Planning has a positive and significant relationship with the success of a program because it determines a series of actions to achieve optimal outcomes (Kurnia, 2013).

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> *"We participated in making a work plan, joined together, including with the supervisor, with the head of management in all activity group we invited when making plans. We can usually do it every 3 months or 4 months there is an evaluation…."* (The Midwife)

Organizing is an activity to handle human resources into labor, work relations, delegation of authority, integration and coordination in the organizational structure. Coordination among administrators in the Family Planning Village Program was quarterly conducted. Moreover, coordination is also done informally through social media and cell phones. Good coordination in work will also improve the performance of the implementers (Afniyanti, 2016).

> *"That is cross-sectoral coordination. We usually meet in the maternal and child health services or at the sub-district office where we do fingerprint. We set their fingerprint attendance here to gather them in a while for chatting with them. It is just our strategy. The soldiers collect data here and talk about their programs".* (Family Planning Field Worker)

In turn, after the Family Planning Village Program had been implemented, the number of long-term contraceptive users increased from 6.07% to 6.21%. The increase can be achieved presumably because of the Contraceptive Technology Update (CTU) training for Dukuhsia midwives and training for cadres to improve their ability of socialization to the community. Training has a significant influence on performance (Landa, 2018). The skills of cadres in communication, data processing and coordination greatly affect performance. Training can equip cadres to improve the quality of Advocacy Assistant for Village Family Planning performance (Muslikh and Nugraha, 2014). The availability of contraceptives in Dukuhsia Village thus increases the access to obtain family planning services. The users who get complete facilities and infrastructures for family planning services tend to use the long-term contraceptives (Fienalia, 2012). There is an organizational structure that provides a job description for each implementer so that the program activities can run systematically. Along the streets, the Dukuhsia Village give names with types of contraceptives so as to improve people's memory about it.

The Family Planning Village Program has been established since 2016, and it still requires an accountability. Accountability is carried out by evaluating each Family Planning Village Program at the end of the year and quarterly reporting inventory activities. In addition, it also was accompanied by monitoring and supervision from Family Planning Outreach Workers of Rambipuji, Rambipuji Women Empowerment and Child Protection and Representatives of East Java Provincial the National Board of Population and Family Planning.

> *"Supervision is done from top to bottom gradually. Some are coordinated from top to the village who has the Family Planning Program. Sometimes it comes from here to the village. We sometimes cooperate with other institutions, talk about the progress. The Jember Women Empowerment and Child Protection always cooperate*

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with Primary Health Care. The Women Empowerment, Child Protection and Family Planning conducted supervision for 3 up to 4 times…" (Advocate Assistant for Village Family Planning)

Monitoring and supervision can have a positive effect on the performance of the program implementers. Supervision tends to be related with family planning services according to the Standard Operating Procedure. It indicates that the implementers who receive supervision tend to provide family planning services based on the Standard Operating Procedure. Guidance can increase the motivation of cadres and other implementers in improving the quality of services in the Family Planning Villages (Rahayu, 2016).

The indicator of success is Rambipuji. Thus, the Family Planning in Dukuhsia Village will be considered successful if the increase in long-term contraceptives in Dukuhsia is higher than in Rambipuji.

"The indicator of success is the Village whether there is an increase in the number of long-term contraceptive users. If the Village has more, it means that the program is successful…" (The cadre under the Advocate Assistant for Village Family Planning)

Based on the interview, it can be seen that the Family Planning Program in Dukuhsia has only been run for two years, but there are many benefits and perceived changes. There is great hope to continuously support further programs to help the community progressive.

Outputs of Family Planning Village Program

Table 1 shows that more than half of respondents have relatively sufficient knowledge (> 50%). Total of 16.17% had less knowledge about long-term contraceptive methods and as many as 25% of respondents had good knowledge of long-term contraceptive methods. Knowledge about family planning, especially long-term contraception has an important role in the success of Family Planning Program. Lack of knowledge of family planning causes husbands not to allow their wives to use long-term contraceptives, so wives tend to choose short-term contraceptives instead (Murniati *et al.*, 2016). One of important factor in the long-term contraception is client's knowledge (Tibaijuka *et al.*, 2017), so good knowledge will be useful for improving better utilization of long-term contraceptives (Getahun *et al.*, 2018). Because of that, community's knowledge of the Family Planning Program in Dukuhsia still needs to be improved.

Table 1. Knowledge of Respondents about Long-Term Contraceptives.

Knowledge	n	%
Less	4	16.2
Moderate	14	58.3
Good	6	25.0
Total	24	100

Table 2. Respondent Utilization to Long-Term Contraceptive Method Services.

Places of Service	n	%
Hospitals	8	33.3
Primary Healthcare Centers	16	66.7
Total	24	100

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.65-78

Primary healthcare center in this case include Rambipuji Primary Healthcare Center, auxiliary primary healthcare center and village maternity clinic (polindes). Family planning services provided by the primary healthcare centers involve the installation of implant and IUD. Some other respondents received tubectomy services at hospitals, such as Dr. Soebandi Hospital, Balung Hospital, Jember Clinic Hospital and Bina Sehat Hospital. There were no respondents who received family planning services at clinics, midwives or other practices. Family planning services that are close to home or near to workplace are more preferred by the contraceptive users (Muhatiah, 2012). In Dukuhsia Village, the closest health facilities are primary healthcare centers, auxiliary primary healthcare centers, and village maternity clinic. Therefore, the community are more likely to use contraceptives that can be accessed here.

Table 3. Distance and Travel Time for Respondents to Health Facilities.

Distance	**n**	**%**
≤ 3 km	16	66.7
3 – 15 km	1	4.2
≥ 15 km	7	29.2
Total	24	100
Travel Time		
≤ 10 minutes	16	66.7
10 -30 minutes	1	4.2
≥ 30 minutes	7	29.2
Total	24	100

In terms of distance, the majority of respondents travel ≤ 3 km to primary healthcare centers. Another travels 3 - 15 km to the Jember Clinic Hospital, Bina Sehat Hospital, and Dr. Soebandi Hospital, and others travel ≥ 15 km to Balung Hospital. Respondents whose house is near to family planning services have 4.3 times greater chance to use long-term contraceptives compared to those far from the services (Oyugi *et al.*, 2017).

Furthermore, most of the respondents spend ≤ 10 minutes to primary healthcare centers. Some take ≥ 10 minutes to the Jember Clinic Hospital, Bina Sehat Hospital, and Dr. Soebandi Hospital. The other one respondent ± 30 ie travel time to RSD Balung.

Result and Discussion section contains a description of the main results of the research. It is suggested to the writer to convey the main and important result, but not impressed to read the table containing the research result. respondent travels in ± 30 minutes to Balung Hospital. Easy access with a travel time of less than thirty minutes can attract couples to visit the family planning services. It is relevant with the argument of Tesfaey Haile and Anjullo that distance to health services affects the increase in family planning participants (Tesfaye Haile and Anjullo, 2018). As seen in Dukuhsia Village, the respondents prefer health facilities that can be reached out in ± 5 minutes by motorbikes. It is supported by Muhatiah that health facilities attract more people if it has accessible transportations (Muhatiah, 2012).

The results also showed that all respondents were not required to make payments for family planning services. Respondents who receive IUD and implants treatment only bear transportation cost. Whereas for tubectomy and vasectomy respondents, there is no charge at all either for the treatment cost or transportation cost. Free services tend to encourage community to use contraceptives (Kartika, Budihastuti and Pamungkasari, 2018). Thus, free-charge family planning services can increase participation.

From Table 4, it draws a conclusion that there are respondents who received

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socialization of Family Planning Program, but some did not actively participate in the activities. The majority of respondents who plan to continuously use long-term contraceptives will invite their relatives/neighbors to use the same contraceptive method too. Community participation points the success of Family Planning Program. The program may be failed if community are reluctant to get involved in such program (Agustini, Wati, and Ramani, 2015).

Table 4. Participation of Respondents.

Participation	n	%
Less	5	20.8
Moderate	10	41.2
Good	9	37.5
Total	24	100

At the end of January 2018, there was a slight increase in the family planning participation in Dukuhsia Village even though it was still far beyond the target. Since 2016 the increase in long-term contraception was as many as 20 users (14 implant users and 6 tubectomy users). However, it has not significantly risen the proportion of long-term contraceptive use in Family Planning Village Program.

CONCLUSION

In summary, most of the input factors are not in accordance with the technical guidelines for Family Planning Village Program because of insufficient number because of few Family Planning Outreach Workers, no funding for the activities, and incomplete infrastructure, whereas the implementation method is in accordance with the program guidelines and objectives. Most aspects of the process factor obey the instructions even though there are still many obstacles from the internal and external management. In terms of output, the respondents mostly have enough knowledge of long-term contraception and receive family planning services in primary healthcare centers, which they can reach by motorcycles. All respondents are not required to make payments for family planning services. The participation of respondents in the Family Planning Program is moderate, indicating that there is an increasing number of long-term contraceptive users. In total, there are only 20 long-term contraceptive users, but it is not able to significantly increase the ideal proportion of long-term contraceptives in Dukuhsia.

Therefore, it is necessary to improve input and management aspects of the Family Planning Village through intensive coordination in allocating funds with the village government. The process aspects of the Family Planning Village need to increase through the Contraceptive Technology Update (CTU) training for midwives and conduct a training for cadres to improve their communicative skills for better campaign of LTCM use.

CONFLICT OF INTEREST

The authors stated that there is no conflict of interest for this article.

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

Jurnal Administrasi Kesehatan Indonesia Volume 8 No 1 June 2020
Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.91-106

ORIGINAL RESEARCH

HUMAN IMMUNODEFICIENCY VIRUS (HIV) PREVENTION PROGRAM AMONG MEN WHO HAVE SEX WITH MEN (MSM) IN SEMARANG CITY

Program Pencegahan HIV pada Lelaki Seks dengan Lelaki (LSL) di Kota Semarang

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ABSTRACT

Background: The prevalence of Human Immunodeficiency Virus (HIV) among Men who have Sex with Men (MSM) in Indonesia continues to increase. The HIV cases among MSM in Semarang increased by 43 cases in 2013 to 147 cases in 2017. The prevalence of syphilis among MSM increased by 5.20% in 2011 to 11.38% in 2015. The use of condoms among MSM does not reach 50%. The Prevention Program of Sexually Transmitted Disease of HIV or *Pencegahan HIV melalui Transmisi Seksual* (PMTS) that focuses on sexual transmission risk factors did not provide optimal results.
Aim: This study aimed to analyze aspects affecting the PMTS Program on MSM in Semarang City, including standard and objectives, resources, inter-organizational communication and enforcement activities, characteristics of the implementing agencies, economic, social, and political conditions, and the disposition of implementors.
Method: This study was a descriptive study using a qualitative approach. Primary data were obtained through in-depth interviews with 14 informants, while secondary data were obtained from observation and document analysis. The data were analyzed using content analysis. The research was conducted from July to October 2019 in Semarang City.
Results: The implemetation of the PMTS Program among MSM has some gaps. For example, these included (1) unclear standards of PMTS Program, (2) limited funding and infrastructures, (3) lack of communication, (4) stigma and discrimination at the stakeholder level, implementing agencies level, and community level.
Conclusion: The implementation of PMTS Program among MSM has not worked appropriately. Eliminating stigma and discrimination against MSM needs to be taken into account. All health workers in primary healthcare centers must be introduced to the diminish of stigma and discrimination against MSM. Communication and coordination as well as resources among the program implementers have to be more well-established.

Keywords: Human Immunodeficiency Virus, Men who have Sex with Men, prevention program.

ABSTRAK

Latar Belakang: *Prevalensi kasus Human Immunodeficiency Virus (HIV) pada Lelaki Seks dengan Lelaki (LSL) di Indonesia terus meningkat. Penemuan kasus HIV pada LSL di Kota Semarang juga mengalami peningkatan dari 43 kasus pada tahun 2013, menjadi 147 kasus pada 2017. Prevalensi sifilis pada LSL meningkat dari 5,20% pada tahun 2011 menjadi 11,38% pada tahun 2015. Penggunaan kondom di kalangan LSL, tidak mencapai 50%. Program Pencegahan HIV Melalui Transmisi Seksual (PMTS) sebagai upaya pencegahan HIV AIDS dengan faktor risiko penularan melalui hubungan seksual, dirasa belum berjalan optimal.*
Tujuan: *Penelitian ini bertujuan untuk mengetahui bagaimana implementasi Program PMTS pada LSL di Kota Semarang, ditinjau dari faktor tujuan dan standar, sumberdaya, komunikasi antar organisasi dan kegiatan pelaksanaan, karakteristik badan pelaksana, lingkungan ekonomi, politik dan sosial, serta disposisi pelaksana.*
Method: *Penelitian ini adalah penelitian deskriptif dengan pendekatan kualitatif. Pengumpulan data primer dengan cara indepth interview terhadap 14 orang informan, sedangkan data sekunder diperoleh dari pengamatan dan telaah dokumen. Analisis data dilakukan dengan content analysis. Penelitian dilaksanakan di Kota Semarang selama bulan Juli hingga Oktober 2019.*

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.91-106

Hasil: *Terdapat beberapa kesenjangan dalam pelaksanaan Program PMTS pada LSL. Contoh kesenjangan tersebut meliputi (1) sasaran Program PMTS yang kurang jelas, (2) kurangnya komunikasi, (3) keterbatasan sumber dana dan sarana prasarana (4) stigma dan diskriminasi terhadap LSL, baik di tingkat pemangku kepentingan, pelaksana program maupun masyarakat.*

Kesimpulan: *Implementasi program PMTS pada LSL belum berjalan dengan baik. Upaya penghapusan stigma dan diskriminasi terhadap LSL perlu terus diupayakan. Semua petugas kesehatan di Puskesmas harus dikenalkan tentang penghapusan stigma dan diskriminasi terhadap LSL. Komunikasi dan koordinasi serta sumber daya di antara pelaksana program PMTS perlu terus ditingkatkan.*

Kata kunci: *Human Immunodeficiency Virus, Lelaki Seks dengan Lelaki, program pencegahan.*

Received: 1 March 2020 ***Accepted: 4 April 2020*** ***Published: 29 May 2020***

INTRODUCTION

HIV/AIDS continues to be a concern across countries worldwide. Data from the Joint United Nations Programme on HIV/AIDS (2018) mentioned that until the end of 2017, around 36.9 million people in the world lived with HIV/AIDS, and 1.8 million additional cases suffered from HIV/AIDS.

The HIV epidemic in Indonesia is still concentrated among specific key populations (direct and indirect female sex workers, people who inject drugs, men who have sex with men, transgendered people, and high risk men) except in Papua, experiencing a low level of generalized epidemic. The nationally estimated prevalence among the adult population was 0.33%. Data released by the Ministry of Health (2017a) showed at the end of 2017, as many as 280,623 people lived with HIV and 102,667 got AIDS in Indonesia. Sexual risk behaviors among heterosexuals became the most tendentious HIV transmission risks at 69.6%, the use of unsterilized needles decreased by 9.1% and the number of homosexuals was 5.7% (Indonesian Ministry of Health, 2017b).

In the last decades, the trends of HIV prevalence in Indonesia has shifted. New HIV cases through contact with needles are now shifting to transmit through Female Sex Workers (FSW), and now HIV is transmitted through Men who Sex with Men (MSM) (Indonesian Ministry of Health, 2017b). From 2007 to 2015, the HIV prevalence among MSM increased by 5.35% to 25.80%. The estimated number of MSM was 1.1% out of all male adults aged between 15 and 49 years in Indonesia. The risk factors of HIV transmission among MSM were 28 times greater than among other populations, and this prevalence of HIV continues to increase in the following years (Indonesian Ministry of Health, 2017a; Joint United Nations Programme on HIV/AIDS, 2018a).

The Prevention Program of Sexually Transmitted Disease of HIV or *Pencegahan HIV melalui Transmisi Seksual* (PMTS) is a national HIV and AIDS prevention program focusing on risk factors through sexual transmission, whether it is a heterosexual or homosexual transmission. The PMTS Program has been developed since 2008 to respond to the increasing HIV and AIDS cases through sexual transmission (National AIDS Coalition, 2010). The PMTS Program is the implementation of the Regulation of the Indonesian Minister of Health Number 21 of 2003 concerning HIV and AIDS Prevention, and this regulation was stipulated too in the Regulation of Semarang City Number 4 of 2013 concerning HIV and AIDS.

Without any policy implementation, programs will only become a pile of documents. To implement a public policy, there are two steps taken, such as implementing the policy directly in a program or formulating derivative policies

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Published by Universitas Airlangga
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from the public policy (Nugroho, 2011). The policy implementation of PMTS results in the PMTS Program.

Although PMTS Program has been implemented for years, it does not optimally cope with HIV and AIDS cases in Indonesia, especially in the key population of MSM (Hubaybah and Fadzlul, 2014; Puspitaningtyas *et al.*, 2014; Rokhmah and Khoiron, 2015). The prevalence of Sexually Transmitted Infections (STI), especially syphilis among MSM, gets increasing. Men who get STI may be at an increased risk of HIV infections (Pathela *et al.*, 2013; Peterman *et al.*, 2014). Studies demonstrated that a recent syphilis infection can increase the risk of HIV seroconversion by 2.6 times (Solomon *et al.*, 2014). The Integrated Biological and Behavioral Survey (IBBS) in 2007, 2011, and 2015 described an increase in the prevalence of syphilis among MSM of 4.33%, 9.29%, to 15.71%. The survey in 2011 also exhibits that the latest consistency of condom use for anal sex among MSM in Surabaya City was at 75.9% but decreased by 53% according to Quick Behavioral Survey in 2013. The same consistency was also found in the 2015 Integrated Biological and Behavioral Survey, which discovered that the use of condoms among MSM was still low (Indonesian Ministry of Health, 2015).

Ranked as the second-highest HIV cases in Central Java, Semarang City found 534 new HIV cases and 33 AIDS cases in 2017 (Semarang AIDS Coalition, 2017). The number of HIV cases among MSM in Semarang increased by 43 cases in 2007 up to 147 cases in 2017. The prevalence of sexually transmitted infections, syphilis among MSM, increased by 5.20% in 2011 up to 11.38% in 2015. Besides, the use of condoms among MSM in Semarang City did not reach 50% (Indonesian Ministry of Health, 2015).

Many factors affect the success of public policy implementation, especially for overcoming HIV and AIDS (Dasgupta *et al.*, 2016; McRobie *et al.*, 2017; Philbin *et al.*, 2018). The analysis of the integration of HIV/AIDS program with national health system in Indonesia showed that the program implementation failed not because of regulation and policy formulation, but poor policy implementation (Center for Health Policy and Management of Gajah Mada University, 2015). Van Meter and Van Horn in the public policy implementation theory asserted that some factors influencing on the success of public policy implementation involve policy objective and standard, inter-organizational communication and enforcement activities, characteristics of implementing agencies, economic, social, and political conditions, and disposition of implementors (Van Meter and Van Horn, 1975).

This study aimed to analize the implementation of the PMTS Program among the key population of MSM in Semarang City. This study looked at several factors, such as policy objective and standard, inter-organizational communication and enforcement activities, characteristics of implementing agencies, economic, social, and political conditions, and disposition of implementors. This study was expected to provide a recommendation for future improvement of the HIV/AIDS prevention program, especially among MSM.

METHOD

This study utilized an explorative-descriptive design with a qualitative method. It was conducted in Semarang City from August to October 2019 by deploying in-depth interviews, observation, and document review. An in-depth

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Published by Universitas Airlangga
Doi: 10.20473/jaki.v8i1.2020.91-106

interview was done by using an interview guide book to investigate the implementation of the PMTS Program among MSM. This study explored some factors that affect the program implementation, such as policy objective and standard, inter-organizational communication and enforcement activities, characteristics of implementing agencies, economic, social, and political conditions, and disposition of implementors.

This study involved 3 key informants which were selected with a purposive sampling. The main informants were the ones who manage the PMTS Program, such as the Semarang AIDS Coalition, District Health Office, and the Indonesian Family Planning Association. While the triangulation informants were those who manage the PMTS Program, such as6 primary healthcare centers and 5 patients who are MSM and have accessed HIV services in the primary healthcare centers. All six primary healthcare centers were chosen because of the higher number of MSM visits compared to other primary healthcare centers in Semarang. MSM patients as informants were obtained by primary helathcare centers officers. They contacted the MSM patients who accessed the HIV services and were willing to take a part in the study.

Face to face interview with each informant was scheduled at their convenient time and places. Prior to the interviews, informants were informed about the aim of the study and the mechanism of their voluntary participation. The interview took approximately 60 minutes used a tape recorder. To inform the informants about the research, a written information sheet about the aim and nature of the research was given before the informants were asked to sign a consent form. This study obtained the ethics approval from the Health Research Ethics Committee, Faculty of Public Health, Diponegoro University, Semarang, Indonesia (Ref. No.: 187/EA/KEPK-FKM/2019).

Data obtained through in-depth interviews, observation, and document analysis were analyzed by using Miles and Huberman Models (Sugiyono, 2015). First, the data were summarized as necessary according to the main objectives of this study. Second, the data were presented in narration. Third, the researchers made conclusions based on valid and consistent evidences. The validity of the data was obtained by triangulating sources from the triangulation informants. The researchers further confirmed some information discrepancies to different informants. They considered consistent answers from each informant to draw conclusions (Sugiyono, 2015).

RESULTS AND DISCUSSION

The PMTS Program among MSM in Semarang City applied four activities, such as improving stakeholders' participation, intervening behavioral changes, managing supplies of condoms and lubricants, and providing services for HIV and sexually transmitted infections. All these activities support each other to identify behavioral changes among the key population. The implementation of the PMTS Program among MSM in Semarang City was sought from factors affecting the success of the implementation.

Program Objective and Standard

Policy implementation is a process to change policy objectives and target into real actions. Objective and standard explain further goals to achieve through policy implementation and to find proper achievement assessment. Policy objectives and standards have to be clear

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Doi: 10.20473/jaki.v8i1.2020.91-106

and measurable, and thus they can be executed into actions. Understanding policy objectives and the standard is prominent in policy implementation. The policy implementation might fail when the implementers do not optimally understand the policy objectives and standards (Van Meter and Van Horn, 1975).

As the implementers of the PMTS Program, the main informants from the Semarang AIDS Coalition, District Health Office, primary healthcare centers, and non-profit organizations have understood the objectives of the PMTS Program, as well as the PMTS Program for MSM. They mentioned that the objectives of the PMTS Program were to prevent HIV infection through sexual intercourse by using four activities. These include improving stakeholders' participation, intervening behavioral changes, managing condom supplies as well as services for HIV and sexually transmitted infections. Besides, each of the main informants understood their roles and functions according to these four activities.

> *"PMTS Program aims to prevent HIV through sexual intercourse. The first program was initiated for the key population, actually for all key populations. The PMTS Program consists of four activities, such as improving stakeholders' participation, intervening stakeholders, managing condom supplies and services, especially for HIV and AIDS... All of them have been implemented. We gathered stakeholders, non-profit organization. Also, we provide condoms and services for HIV and sexually transmitted infections..."* (Informant from Semarang AIDS Coalition).

The informants statement were suitable for document review in Chapter 13 of Regulations of Indonesian Ministry of Health No. 21 of 2013 about HIV and AIDS management, as well as PMTS Guidelines published by the National AIDS Coalition. The guidelines mention that PMTS aims to prevent individuals to get HIV and/or other sexually transmitted infections. The PMTS Program was conducted through four integrated activities, which include improving stakeholders' participation, intervening behavioral changes, managing medical supplies, preventing and controlling sexually transmitted infections (National AIDS Coalition, 2010; Indonesian Ministry of Health, 2013).

Policy standards implicitly or explicitly can be drawn upon the indicators as mentioned in the policy. These indicators are the real actions of policy objectives and standards. Policy indicators may come from policymakers' statements or criteria in documents, such as regulations or guidelines used to evaluate a policy (Van Meter and Van Horn, 1975).

Unlike the answers about policy objectives, the main informants gave different perspectives about the standard of PMTS Program among MSM. The main informants from Semarang AIDS Coalition stated that the standard of PMTS Program is the completion of those four activities. While the main informants from Non-Profit Organization said that the number of reached MSM is the standard of PMTS Program for MSM. In contrast, the Semarang District Health Office mentioned no target number of MSM to provide HIV testing services. This argument was in line with the main informants from primary healthcare centers.

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> *"There is no target number for PMTS Program. We normally use a fast-track target like 90% of HIV status was detected. Then, we breakdown the lists of people with HIV. We tested the key population. We target all patients who come will get served. In short, we never target the minimum number of patients in providing HIV services.."* (Informant from District Health Office).

The document review showed that the indicators of the PMTS Program are different in measuring the implementation success among MSM. The National AIDS Coalition mentioned in the Guidelines for HIV and Sexually Transmitted Infection Program that there are some core indicators in monitoring and evaluating the program. These include the number of PMTS locus, the reachable number of key populations, the number of distributed condoms, and the number of key populations that participate in HIV screening and undergo HIV and sexually transmitted infection services (National AIDS Coalition, 2010).

The National Strategy and Action Plan from 2015 to 2019 determines indicators of the prevention program and behavioral changes of key populations. First, the achievement of peer education, information and education communication, and HIV prevention tools, such as condoms and lubricants based on the targeted MSM's needs was respectively 28%, 36%, 44%, 52%, and 60% between 2015 and 2019. Second, the target use of condoms for sexual intercourse once a week or in the last month among MSM from 2015 to 2019 was 64%, 68%, 72%, 76%, and 80% respectively. Third, the percentage of targeted key populations tested for HIV in the period of 2015 to 2019 amounted to 25%, 40%, 60%, 70%, and 80% respectively (National AIDS Coalition, 2015).

Semarang Strategy and Action Plan in the period of 2016-2020 stated that the PMTS Program for high-risk population has several indicators. One of them is to provide counseling to high-risk populations (female sex workers, men who have sex with men, and Lesbian Gay Bisexual Transgender) with percentages of 40%, 50%, 75% and 80% from 2017 to 2020 (Semarang AIDS Coalition, 2016).

Interview and review results of the guidelines explain that the program implementers have clearly understood the program objectives, but they have a different opinion about the program standard. A review of three PMTS program documents showed that the PMTS Program among MSM has not had a clear and consistent target. Each guideline has its indicator different from other documents. Unclear program target makes the main informants have a different understanding of the program target. All policy implementers have to comprehend what matters in the policy since they will be responsible for implementing it. Different understanding will lead to unachieved goals of the PMTS Program among MSM (Kadji, 2015). Policy failure was also found in Nigeria, where policymakers failed to clearly define the policy objectives, as well as had over-ambitious objectives that are difficult to achieve (Kamoru and Ahmed, 2016).

In overcoming such problems, Semarang AIDS Coalition has to participate actively as a coordinator for HIV prevention, who promotes the objectives and standards of the PMTS Program among MSM. They can gather individuals to inform about PMTS policy or

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program to all PMTS working groups in every coordination meeting which has regularly run for 6 months.

Resources of PMTS Program

According to Edward III in Widodo (2012), the success of policy implementation depends on resources. A program or policy will run well when human resources are available and competent, funding is adequate, and facilities and infrastructures are well-provided. Human resources are one of the resources that have important functions in succeeding the policy implementation. Every process of policy implementation demands competent human resources that have the expertise required in the policy (Widodo, 2012).

Most of the main informants argued that the PMTS Program in Semarang has enough human resources. The number of human resources is considered sufficient in implementing all activities of the PMTS Program.

> *"The human resources for patient outreach come from the Indonesian Family Planning Association (PKBI). They are funded by the donors. The number of human resources for HIV healthcare service are just enough. I think there is no problem in Semarang in terms of human resources..."* (Informant from Semarang AIDS Coalition).

Most of the main informants considered that the workers have enough competence. It is noticeable from their educational background, which most of them graduated from the Associate's Degree, Bachelors, and masters. A program for developing the workers' competency is conducted concurrently through training and On Job Training (OJT) by Semarang District Health Office.

> *"Now we have been developing HIV services without certified counselors, but Provider-Initiated HIV Testing and Counseling (PITC). Our laboratorians have regular refreshment meeting every two years. We also conduct workshops..."* (Informant from District Health Office).

The triangulation informants who accessed HIV services in primary healthcare centers stated that the health workers in the front office often put stigma and discrimination against them. The health workers tend to preach MSM about norms and morals, and thus these bother them.

> *"I still found stigma and discrimination in the services like they say "you shall repent what you have done. Why do you like men?" Some staffs talk about it. It is bothering somehow. The staffs basically only need to explain about health consequences and treatments instead of norms, religious norms, and morals.."* (Informant who acessed the HIV service).

Despite that, finance also affects the effectiveness of program implementation. Limited funding will influence the success of the program implementation. The main informants from Semarang AIDS Coalition and Semarang District Health Office supposed that the funding was lacking. Grants were given to Semarang AIDS

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Coalition for conducting coordination meetings and meeting with working groups of PMTS. Meanwhile, the main informants form the Non-Profit Organization and primary healthcare centers argued that the grants were sufficient for implementing the PMTS Program among MSM in Semarang.

> *"Normatively, the grants are lacking , but we use it optimally. The amount of grants are allocated by the District Government and District Health Office. If there is funding efficiency, all Regional Working Units (SKPD) will receive less funding..."* (Informant from Semarang AIDS Coalition).

The Semarang District Health Office obtains financial support from various sources, such as National Budget (APBN), Specific Allocation Fund (DAK) and Local Governmet Budget (APBD). Semarang District Health Office in 2018 collected Local Government Budget amounted to IDR 334,047,627,000.00. Compared to Semarang Local Government Budget amounted to IDR 3,513,753,947,218.00, the percentage of allocation funds given to the Semarang District Health Office was 9.51%. They spend IDR 565,102,500.00 or 1.7% for HIV and AIDS Prevention Program. The allocation fund for HIV Prevention Program decreased by IDR 320,000,000.00 in 2019 since the government focused on infrastructure development and made more efficiency of program funding.

Another financial problem is the financial allocation for the PMTS Program among MSM. The main informants stated that they were afraid to allocate certain budget for the PMTS Program among MSM.

> *"We are not brave enough to propose activities for MSM. But, if we get funding from donors, we can target activities for MSM. The donors provide all since they prioritize them. However, we are fearful of using Local Government Budget to conduct activities for MSM..."* (Informant from Semarang AIDS Coalition).

A program will not work well when there is no enough infrastructure and facilities. It is not enough to just have competent human resources and funding but supporting infrastructure and facilities. As a result, policy implementation will fail.

Regarding facilities and infrastructure, most of the main informants said that the availability of infrastructure and facilities for the PMTS Program among MSM in Semarang were considered adequate. However, based on the observation, four of six selected primary healthcare centers had no specific counseling room for HIV services. The counseling room is merged with other patient rooms. Such a room setting will make MSM uncomfortable when they consult the health workers.

In conclusion, problems found in terms of resources are that the health workers still put stigma and discriminate MSM, and the grants are still inadequate. Also, the health workers were afraid to allocate funds for PMTS Program among MSM, and the availability of infrastructure and facilities is still not good, especially the setting of the counseling room.

Viewed from the number and competency of the human resources in the primary healthcare centers, the health workers have a good educational background. Nevertheless, it does not

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guarantee that there will be no stigma and discrimination in healthcare services. In fact, not all health workers participate in HIV training, especially that talks about avoiding stigma and discrimination in healthcare services. There is only one team selected to represent in the HIV training, while patients who are MSM will meet with other health workers who might not get exposed to it.

These findings are different from what has been found among health workers in Malawi. The health workers have admitted that MSM have needs and equal rights to health access. They provide the best services because they realize their professional responsibility (Kapanda *et al.*, 2019).

Moreover, inadequate availability of infrastructure and facilities, such as a counseling room that has not been specified, will hardly make MSM reveal their health status to the health workers. Therefore, the health workers cannot provide the best services matching to their health condition and needs (Philbin *et al.*, 2018).

Financially, the Semarang AIDS Coalition and Semarang District Health Office received insufficient funding for PMTS Program and some other related activities, especially from the Local Government Budget. Apart from the funding efficiency by Semarang Regional Government, fear of proposing a certain financial plan for HIV Program among MSM made the funding mechanism worse. When it is impossible to exactly come up with the issue of MSM during the financial arrangement advocacy, this situation will affect the funding received.

The results also have the same ideas as a study conducted in Sorong District. The support of funding allocation for the HIV AIDS Prevention Program was still lacking since Sorong AIDS Coalition and Sorong District Health Office did not report the HIV AIDS prevention to the key policymakers, such as Agency for Regional Development (BAPPEDA) (Mahendradhata *et al.*, 2015).

Good resources, e.g. human resources, funding, infrastructure, and facilities, will be significant for implementing a program well. The ideas are in line with a study about the integration of HIV/AIDS Prevention Program in a health system. They picked a case study of the PMTS Program among MSM in Denpasar. The lack of resources, specifically funding and human resources, affects the success of the integrated PMTS Program in Denpasar District (Nopiyani, Sari and Sutarsa, 2016).

Interorganizational Communication and Activity Execution

Implementing a program needs support and collaboration with other stakeholders. The success of program implementation depends on the institutional procedures and mechanism, whether top-level managers need to take over the implementation or not. Thus, their participation can control the implementation according to the objectives and standards (Subarsono, 2012).

Having discussed the clarity and consistency of communication, the main informants said that the information of the PMTS program has been spread in a fast, clear, and consistent way. All information refers to the Regulation of the Indonesian Ministry of Health Year 2013. It has been informed to the lowest personnel position, which is the key population of MSM. Based on the interview, the inter-organizational communication process has run well. The organizations gather both offline and online in coordination meetings or telephone and social media such as Whatsapp.

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However, this study found that communication and coordination between the institutions were still lacking. Even though activity coordination was carried out routinely, not all stakeholders did not eagerly participate. Only Semarang AIDS Coalition and Semarang District Health Office took a part in the Program. Meanwhile, other institutions which are members of the PMTS working group were involved if a program relates to their duties and functions.

> *"The stake holders... It can be understood because it is not their main function, except for the District Health Office and the AIDS Coalition. While it is not the main roles of others institutions unless there are sex parties in which they contribute to combat. However, if the context is about HIV prevention, other PMTS working group members will not take a part"* (Informant from Semarang AIDS Coalition).

The researchers also found a problem in terms of the supply management of condoms and lubricants. While Semarang AIDS Coalition mentioned that the distribution of condoms and gels have been distributed to primary healthcare centers, some of the primary healthcare centers collect condom supplies from National Family Planning Coordination Board (BKKBN) through maternal and child health program as well as family planning program. Furthermore, they reported that Semarang AIDS Coalition never distributes lubricants for PMTS Program. The main informant from Semarang District Health Office stated that the supply management of condoms and lubricants was overtaken by Semarang AIDS Coalition.

> *"Since I motivate to use condoms, I will give MSM. However, they need lubricants. Unfortunately, we do not have it. The BKKBN provide the condom supplies, while we do not have any lubricant supplies. We will give a condom that BKKBN gives to us. I do not think we have some from Semarang AIDS Coalition. We only receive reagents perhaps from the District Health Office, or we never ask them for condom supplies..."* (Informant from 5th Primary Healthcare Center).

The lack of communication and coordination in the program implementation impedes the success of the PMTS Program in Semarang. It also occurs in the implementation of the PMTS Program in Tanah Bambu District. The researchers, Juhairiyah and Lenie Marlinae, discovered that inter-organizational coordination shortage resulted in an unwell-implemented PMTS Program, and thus the implementers could not reach the key population of MSM (Juhairiyah and Marlinae, 2016). The unavailability of condoms and lubricants in the primary healthcare centers matters because condoms and lubricants are away effective to prevent HIV among MSM (Haig *et al.*, 2016; Johnson, Leary and Flores, 2018).

Implementing Bodies' Characteristics

Characteristics of implementing bodies include their bureaucrary structures, organizational norms, and pattrens of relationships that occur in

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bureaucracy. The characteristics of implementing bodies can be seen through whether or not they apply Standard Operating Procedures (SOP), task distribution mechanism, and supervision (Subarsono, 2012). These overall characteristics will impact the implementation of programs.

Speaking about SOP, the main informants from Semarang AIDS Coalition and Semarang District Health Office stated that they have already had SOP of PMTS Program, especially in the primary healthcare services. SOP is formulated by referring to the Regulation of the Indonesian Ministry of Health. All main informants from the primary healthcare centers also asserted that they have SOP of HIV services, including SOP of Voluntary Counselling and Testing (VCT), Prevention of Mother-To-Child Transmission (PMTCT) and sexually transmitted infections.

Standard Operating Procedures in the technical implementing bodies, e.g. primary healthcare centers, are crucial. The SOP is used to document how tasks are completed in the primary healthcare centers with the right guidelines. SOP also communicate clarity and easy access to services when patients use healthcare services. In the same way, the triangulation informants (MSM) thought that the primary healthcare centers already have clear and understandable patient flow.

Furthermore, the main informants from Semarang AIDS Coalition claimed that they have shared jobs with the District Health Office and Non-Profit Organization. The coordination meetings of PMTS working group are conducted every 6 months by Semarang AIDS Coalition. This coordination meetings discussed four main activities of PMTS Program. Data monitoring and evaluation of the meetings are done every three months by Semarang District Health Office. The task division can be used to give the same perception and avoid missing tasks. In the primary healthcare centers, all main informants also argued that they have shared tasks well and clearly in implementing the PMTS Program among MSM.

In terms of supervision, the main informants from the primary healthcare centers stated that the District Health Office have conducted supervision. They usually do field supervision or attend meetings at least twice a year. Participation from stakeholders across multiple levels will improve responsibility among the implementers to achieve the program's success.

A study conducted by Fritantus and Rukminingsih (2015) supports these findings. The researchers found that flexible procedures and good control over the program will enhance responsibility among implementers of HIV prevention policy in Surabaya. Clear regulations will ease access to HIV and AIDS services (Fritantus and Rukminingsih, 2015).

Social, Economic, and Political Condition

Subarsono (2012) asserted that the effect of the environment on policy implementation can be measured from several indicators. For example, it can be seen from how financial resources contribute to the success of program implementation, to what extent the stakeholders support the policy implementation. Even more, other effects can be measured from how the community views this policy and whether elite parties support the policy implementation or no.

Most of the main informants said that there is no financial shortage in implementing the PMTS Program among

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MSM. In primary healthcare centers, all types of HIV services are accessible and free for all Semarang citizens. Whereas, patients outside Semarang only need to pay retribution fee of IDR 5,000.00. When the patients are required to take further tests in the referral health providers, they will get financial support from the donors e.g. only for viral load and CD4 tests.

However, a study in Central Java had opposite findings. The economic condition becomes a constraint for people living with HIV and AIDS to afford healthcare services (Sagala, Suwitri and Santoso, 2013). Another study in Vietnam also claimed economic condition impedes MSM to access healthcare services since the health financing uses out of the pocket system. It means that patients will visit primary healthcare centers if only they get severe symptoms (Philbin *et al.*, 2018).

While the political condition already has supported the PMTS Program. The political elite's support in dealing with HIV can be seen in the Regional Regulation Number 4 of 2013. The Semarang Mayor always attempted to involve the key population group in every HIV/AIDS activity to involve the key population group. However, research about HIV policy in Surakarta discovered that the political condition is not supporting, and thus it hinders the implementation of the HIV Prevention Program (Wahyuningsih, 2017). A social condition also becomes another concern. It was found that the community still disapprove and discriminate against MSM.

> *"There are a lot. From 1 to 10, I can say that the level of stigma and discrimination is 6 to 7. It often occurs. A head of family passed away due to AIDS, and until now, his wife and kids have to be tested in every mobile VCT. It is a stigma, isn't it? Even though now his son has been working, he is still labeled. It was his father's first HIV even though it was not reactive and occurred years ago"* (Informant from 2nd Primary Healthcare Center).

> *"Society tends to approve people living with HIV and AIDS. They will disregard when they know the people suffer AIDS because they are MSM, LGBT..."* (Informant from District Health Office).

In a nutshell, the economic factor is not the issue for MSM to access HIV services. The elite parties have supported the PMTS Program. However, society still negatively views people living with HIV and AIDS especially those who are MSM.

Stigma and discrimination are obstacles to prevent HIV and AIDS. MSM often get discriminated from their MSM community, family, friends, and colleagues. Such disapproval and discrimination can cause MSM reluctant and afraid of coming out and accessing HIV services (Philbin *et al.*, 2018). A study about HIV and AIDS policy in Central Java also exhibited the same findings. Social disapproval makes people living with HIV and AIDS hard to expose themselves. As a result, the HIV/AIDS Prevention Program is not well-executed (Sagala, Suwitri and Santoso, 2013).

Disposition of PMTS Program

Disposition is another essential factor in policy implementation. Disposition is described in 3 components, such as the implementer's understanding of the policy, disposition orientation, and intensity of implementer's responses towards the policy (Van Meter and Van Horn, 1975).

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The implementer's understanding about the general objectives and standards of the policy are important. If implementer respond to standars, they act on the ideas about instruction that they construct from and about these stadards. If implementers construct ideas that misconstrue policy maker's intent, then implementation failure is likely. Implementation failure in this case result not because implementers reject the reform ideas but because they understand them differently (Spillane, Reiser and Todd, 2002).

The main informants form Semarang AIDS Coalition mentioned that they have understood and practiced all four components of the PMTS Program. Moreover, the main informants from the District Health Office, primary healthcare centers and Non-Profit Organization understood not only about the program objectives, but also their roles in the program.

In supporting the policy implementation, disposition orientation toward the standards and objectives is crucial also. Implemeters may fail to execute policies faithfully because they reject the goals contained in them. Conversely, acceptance of the policy objectives can improve the success of policy implementation. According to Edwards III in Nugroho (2011), disposition has to do with willingness of the implementers to carry out a given public policy. Capacity is not enough without willingness and commitment to implement a policy (Nugroho, 2011). Those with good understanding and disposition orientation have a strong commitment to the program implementation.

Concerning disposition orientation, the main informants from Semarang AIDS Coalition worked wholeheartedly since they are responsible for their job and roles. The District Health Office and the primary healthcare centers have a strong commitment to implement the HIV Prevention Program. Meanwhile, the authorities across sectors tend to do half-hearted jobs.

> *"Well, they (the authorities across sectors) just have to work somehow in a half-hearted way. But, we will completely do it since it is our job. While others might just do their job half-heartedly. They rejected the MSM community from the first time they knew them. We just do as possible as we can. We work since it is a mandate from Semarang AIDS Coalition..."* (Informant from Semarang AIDS Coalition).

The implementers of the PMTS Program have good disposition orientation with a strong commitment. They have understood the program goals and objectives and been responsible for their job and roles. Commitment to the policy objectives and necessery sklills in using available resources to achive policy objectives, lead to successfull policy implementation (Khan, 2016). Despite that, the researchers found that the worst disposition orientation came from the authorities across sectors. In the very first place, they have negatively viewed the MSM community, suggesting poor disposition in implementing the PMTS Program.

The response intensity influences the program's success too. Behavioral changes are examples of responses to the policy. Implementers who negatively value the policy will deviate the program objectives. Stigma and discrimination are

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a part of negative perception of the key population group of MSM.

> *"Maybe lots of the stakeholders still have stigma and discrimination towards MSM. They do not agree with it. They view from the perspectives of religion, law, and morals..."* (Informant from Semarang AIDS Coalition).

In short, the disposition orientation supports the program implementation, but most of the stakeholders do not have good response intensity towards the PMTS Program among MSM. The stakeholders still consider that MSM do deviant behavior. Thus, good disposition orientation is not enough to make a program successful. It is required to have good response intensity too.

There are several limitations in this current study. First, the study only took the main informants from Semarang AIDS Coalition, Semarang Dictrict Health Office, 6 primary healthcare centers, and the Semarang City Non-Governmental Organization of the Indonesian Family Planning Association. This did not explain other information from other implementing institutions which are members of the Semarang AIDS Coalition outside the health sector.

Second, this study only involved small numbers of MSM samples, and the majority of the informants were from the same location, Semarang City. It is, therefore, less likely to generalise the results to other MSM populations in Indonesia and other similar settings. Moreover, MSM are marginalized population, and socially inactive subgroup might be less likely to reach. Therefore, the samples in this study might not fully represent the whole population of MSM in Semarang.

CONCLUSION

The PMTS Program among MSM in Semarang has not been run well. The stakeholders, implementers, and community still put stigma and discrimination on MSM, and thus these become the biggest challenges in the program implementation. Some other obstacles included unclear program standarts, limited funding and infrastructures, lack of communication and coordination among the implementers. All of these hinder the implementation of PMTS Program.

Eradication of stigma and discrimination by stakeholders across multiple levels is required. The Semarang AIDS Coalition and Semarang District Health Office as the main institutions to combat HIV must first strengthen their coordination to eliminate stigma and discrimination before forcing other stakeholders and community. All health workers in primary healthcare centers, not just limited to HIV/AIDS team, have to be introduced to ways of eradicating stigma and discrimination against MSM. Communication and coordination among the implementers should be improved under the supervision of the Semarang AIDS Coalition. Lastly, resources in terms of funding and infrastructures also need to be improved.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest for this article.

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