Original Research

How Is The Readiness To Carry Out Online Registration In The Malang Primary Health Care?

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ABSTRACT

Background: RME is one of the information subsystems connected to other information subsystems in the health service facility, such as patient registration activities. The purpose of this study is to evaluate the readiness of PHC in Malang to use online registration applications.

Methods: Quantitative descriptive research was used. The research was conducted in 15 PHCs in Malang in June 2021. The population in this study were all patients, all heads of PHCs, and all Medical Record Officers (MRO) at PHCs. The respondents were 15 physicians, 27 MRO, and 330 patients from 15 PHCs seeking medication. The data was measured using a questionnaire designed for patient groups and healthcare provider groups in PHCs per the available literature. Additionally, the scalability and repeatability coefficients for the survey questions are employed in the validity test. The response to questions was presented as an average value.

Results: In accordance with the average Likert Scale, the Head of PHC (4,2), MRO (4,15), and patients (4,18) were all ready to use online registration. The study's findings about PHC revealed that 100% of PHC in Malang had adequate human resources, an effective operating system and application, a supporting computer, and a budget. Only around 50% of PHCs have an online registration policy, though.

Conclusion: All PHCs and patients were ready to use online registration. According to this study, all PHCs should be ready to prepare facilities and infrastructure and implement online registration.

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INTRODUCTION

Communication technology and information have developed rapidly in many sectors, including the health sector. This development was needed in the healthcare area with innovative technology from other industries and academia (Guo & Yao, 2019). The COVID-19 pandemic from the end of 2019 until nowadays caused many changes, including in the health sector.

The previous study, which was conducted on 175 Medical Record Officers (MRO) in East Java and East Kalimantan, showed that during the COVID-19 pandemic there were higher MRO, especially in registration (166 people) who had very high risk (25%), high risk (23%), and fair risk (23%). The study found a higher risk of medical record officers related to interaction with the patient, especially in the registration position (Suryandari et al., 2020). Innovation was needed after the COVID-19 global changes. However, with the rapid development of the internet, online medical services, including registration systems, have become important for patients.

In Indonesia, the majority of primary health care (PHC) facilities still use manual registration systems, resulting in longer wait times and lower PHC quality. This was because patients mostly found narrow waiting rooms, insufficient chairs, and long queues while waiting. Moreover, there was an increase in patient visits, a lack of registration officers, and the time of patient visits, which was earlier than service time (Maulana et al., 2019) (Bustani et al., 2015). One of the innovations in healthcare facilities, especially in primary healthcare, is the use of an online registration system.

Several countries have been using website-based registration systems. Healthcare services in the UK, for example, have already developed an appointment system to obtain healthcare services, which is known as the "*Choose and Book*" registration system. In addition, China has also developed "*Web-based Appointment Systems"* (WAS). The patient can easily look for health care services with an appointment system-based website. They can look for outpatient service schedules flexibly and easily find information in real-time (Yang et al., 2019).

The Ministry of Health (MoH) through Permenkes No.24 of 2022 stated that every Health Service Facility must implement an electronic medical record (RME). RME is one of the information subsystems connected to other information subsystems in the health service facility, such as patient registration activities. This implementation should be done by all Health Service Facility in Indonesia by the end of 2023 (RI, 2022).

The online registration system compared to manual registration gives better benefits and is patient-centered. Most of the healthcare facilities reported positive changes after implementing appointment system-based systems, such as a decrease in the number of absent patients, a decrease in human resources needed, a decrease in waiting time, and an improvement in patient satisfaction (Zhao et al., 2017), giving convenience and avoiding long queues, which happened in traditional systems (Yu et al., 2013). This is why an online registration system could significantly increase patient satisfaction and decrease the entire waiting time effectively (Cao et al., 2011) (Justinia, 2017).

The system also reduced infection transmission during the registration process. In the last decade, the appointment system has increased significantly in healthcare services, which aims to increase efficiency and decrease operational costs (Yu et al., 2013). Another study showed that online registration is very helpful for patients and communities to obtain healthcare services in PHC, so they don't need to come early to queues, be crowded, or wait too long to get health services (Nuswantoro, 2020).

A study about the implementation of registration online in Semarang, Indonesia reported that about 60% of respondents had a positive perception of online registration and agreed to use it (Prameswati et al., 2019). Data taken from Malang Health District Office showed there were 16 PHCs in Malang city. Several PHCs have already

implemented an online registration system. Several PHCs use the JKN mobile application, while others use the WhatsApp method.

However, there was still queuing in the waiting room and this led to the risk of infection transmission between the officer and patient and patient and patient. This study was designed to analyze the readiness of PHC in Malang City to face the changes of a more effective and efficient registration system and decreased contact between patients and medical record officers. The purpose of this study is to evaluate the readiness of PHC in Malang to use online registration applications.

MATERIALS AND METHOD

This study used quantitative description. The research was conducted in 15 PHCs in Malang in June 2021. The population of this study was doctors, MRO, and patients in 15 PHCs in Malang. There were 15 doctors, 27 MRO, and 330 patients from 15 PHCs who came for medication. Total sampling was used as a technique for sampling Healthcare Workers (Head of PHC and MRO).

We used simple random sampling as a technique for sampling patients. The variable in this study is the readiness for online registration implementation in PHC, while the sub-variable is a commitment through policy, human resources, budget, facility, and materials. There were questionnaires as an instrument of research that spread to the respondents, designed for patient groups and healthcare provider groups in PHCs in accordance with the available literature.

There were several ways to test the validity of this study. For Guttman scale questions, use reproducibility and scalability, while for Likert scale questions, use Corrected Item-total Correlation > r table. Qualitative data was analyzed in the descriptive result. Scoring was done by calculating each component, which was method, man, money, machine, and material. The outcome was then graded using the Likert Scale (5 = very ready, 4 = ready, 3 = fair ready, 2 = less ready, and 1 = not ready). The responses to questions were presented in average value.

Ethical clearance had already been approved by Poltekkes Kemenkes Malang with Registered No. 088/KEPK-POLKESMA/2021.

RESULTS

There were 22 patients from each PHC in Malang city, with a total of 330 respondents who participated in this study. According to table 1, the 19-45 age group had the most respondents (65.8%). Most of the respondents were female (73.9%), while most of the patients' last education (47.3%) was senior high school.

The majority of MRO (96.3%) were between the ages of 19 and 45, with 85.2% being female. Most of the MRO's last education (96.3%) is a diploma. Based on the position in PHC, there were more registration officers at 81.5%. All of the heads of PHC were more than 30 years old, and about 73.3% of them were female. Based on their last education, about 93,3% of them were bachelor's graduates.

Table 1. Frequency distribution of Respondent Characteristic

Respondent	Characteristic	Category	n	%
	Age	≤18 years old	33	10
		19-45 years old	217	65,8
		>45 years old	80	24,2
	Gender	Male	86	26,1

Respondent	Characteristic	Category	n	%
Patient		Female	244	73,9
	Education	Master degree	5	1,5
		Bachelor	69	20,9
		Diploma 3	30	9,1
		Senior High School	156	47,3
		Primary High School	53	16,1
		Elementary School	17	5,2
Medical Record Officer (MRO)	Age	20-45 years old	26	96,3
		>45 years old	1	3,7
	Gender	Male	4	14,8
		Female	23	85,2
	Education	Senior High School	1	3,7
		Diploma 3	26	96,3
	Position in PHC	Filing	5	18,5
		Registration	22	81,5
Head of PHC	Age	≤ 30 years old	0	0
		>30 years old	15	100
	Gender	Male	4	26,7
		Female	11	73,3
	Education	Bachelor	14	93,3
		Master degree	1	6,7

In table 2, most of the patients (97,9%) already had a smartphone and were connected to the internet. About 96,1% of respondents already used the internet on their smartphones, and 33% of respondents actively used 2 applications on their smartphones. The budget allocation for smartphone pulse higher (32.1%) is Rp. 25.000-50.000,-per month. The mean value from readiness scoring was 4,18, which means patients in PHC were ready to implement online registration.

Table 2. Patient readiness in using *Smartphone*

Variable	Category	n	%
Smartphone ownership (machine)	Yes	323	97,9
	No	7	2,1
Smartphone connected to the internet (machine)	Yes	320	97
	No	10	3
Using the internet on Smartphone (man)	Yes	317	96,1
	No	13	3,9
Number of applications in smartphone (*material*)	0	4	1,2
	1	74	22,4
	2	109	33
	3	98	29,7
	4	30	9,1
	5	15	4,5
Budget of pulse/month (money)	Above Rp.75.000,-	81	24,5
	Rp 50.000 - 75.000,-	89	27
	Rp 25.000 - 50.000,-	106	32,1
	Rp 10.000 – 25.000,-	37	11,2

Variable	Category	n	%
	Rp 5.000 – 10.000	17	5,2

Related to policy readiness (Table 3), about 55,6% of MRO stated there was a policy for Health Information System (HIS) from Health District Office (HDO), while about 53,3% of Head of PHC stated there was HIS from HDO. About 51,9% of MRO stated there was internal policy in their PHC while more than half of Head of PHC (60%) stated there was internal policy in their PHC.

Table 3. Management Readiness to Implement Online Registration

Management Factor	Variable	Category	Medical Record Officer		Head of PHC	
			$\sum$	%	$\sum$	%
Method	Policy from DHO	Yes	15	55,6	8	53,3
		No	12	44,4	7	46,7
	Internal Policy in PHC	Yes	14	51,9	9	60
		No	13	48,1	6	40
Man	MRO able to operate the online computer	Yes	27	100	15	100
		No	0	0	0	0
	MRO already had training	Yes	26	96,3	15	100
		No	1	3,7	0	0
	MRO had training internet application	Yes	19	70,4	12	80
		No	8	29,6	3	20
	Capability MRO using computer	Fair	27	100	15	100
	Capability MRO using the internet	Fair	27	100	15	100
Money Machine	Funding to implement HIS	Yes	14	51,9	8	53,3
		No	13	48,1	7	46,7
	Funding to provide hardware	Yes	27	100	15	100
		No	0	0	0	0
	Funding to provide software	Yes	25	92,6	15	100
		No	2	7,4	0	7,4
	Funding to conduct socialization and training	Yes	9	33,3	4	26,7
		No	18	66,7	11	73,3
	Funding to conduct maintenance	Yes	24	88,9	15	100
		No	3	11,1	0	0
	Computer fulfill PHC's need	Yes	22	81,5	12	80
		No	5	18,5	3	20
	Computer connected to internet	Yes	27	100	15	100
		No	0	0	0	0
	All computers connected to the internet network	Yes	27	100	13	86,7
		No	0	0	2	13,3
	Availability other	Yes	27	100	15	100

Management Factor	Variable	Category	Medical Record Officer		Head of PHC	
			$\sum$	%	$\sum$	%
	hardware	No	0	0	0	0
Material	Availability internet network	Yes	27	100	15	100
		No	0	0	0	0
	Supported Operating System computer	Yes	24	88,9	14	93,3
		No	3	11,1	1	6,7
	Availability of other software	Yes	21	77,8	12	80
		No	6	22,2	3	20

Related to man's factor, all of MRO (100%) stated that they could operate computers online and this statement was also supported by the Head of PHC. Almost all MRO (96,3%) had already learned about computers/the internet. About 70.4% of MRO stated that they had to attend an internet application course. However, both MRO and the Head of PHC agreed that all MRO could use computers and the internet.

There were more than 50% of MRO and the Head of PHC stated that there was funding support for the implementation of HIS in their PHC. All respondents, both MRO and the Head of PHC, stated that there was support for hardware availability in PHC. Meanwhile, 96.2% of MRO and the Head of PHC stated that there was funding support for software availability. There was no funding support for socialization and training of online system implementation, according to approximately 66.7% of MRO and 73.3% of Head of PHC. Finally, related to maintenance funding support, about 88.9% of MRO stated that there was funding support for it, while 100% of the Head of PHC stated there was full maintenance support.

The facility's readiness is approximately 81.5%. The Head of PHC and MRO stated that computers in PHC already accommodated the needs of PHC, and computers in PHC were already connected to internet networks, and there was other hardware available (printer, cable, internet network, and internet server). The mean value of readiness scoring from the Head of PHC was 4,2, while the mean value of readiness scoring from MRO was 4,18. This meant PHC was ready to implement online registration.

DISCUSSION

Based on the analysis of the 5 management components, patients were ready to implement online registration. According to the study, patients have smartphones that are connected to the internet and actively use two apps on their smartphones. Patients also set aside money on a regular basis to purchase pulses. The readiness to use an online registration system in line with information technology is needed in communities.

Based on survey results, almost 2/3 of communities in Indonesia already owned a smartphone, and about 39% of them were rural (Skinet, 2021). Based on patients' perceptions, patients hoped that they didn't have to wait long to obtain medical services. Healthcare was labeled as qualified by consumers if conducted based on what consumers wanted, such as humanized, fast, full of empathy, friendly, and communicative (Muninjaya, 2012).

Research at Maccini Sombala PHC, Makassar City, in 2019, showed a significant relationship between registration waiting time and patient satisfaction (Maulana et al., 2019). This was also consistent with other studies which stated that healthcare facilities that had already implemented an appointment system-website based could decrease waiting time and improve patients' satisfaction rate (Zhao et al., 2017). Online registration was needed because the patient could come to the healthcare services based on the queuing number provided by online registration, with no queuing and no accumulation of patients in a waiting room. This is also an effective way to stop transmission, which is physical distancing (Kissler et al., 2020).

Research data showed that more than 50% of the heads of PHC and MRO stated that there was already a policy (method) from DHO and also an internal policy related to HIS in PHC. An activity program could be implemented if there was policy support from top management. In this case, the Ministry of Health (MoH) already released a regulation in which all PHCs must implement a PHC Information System either electronically or non-electronically, which was part of the HIS in the city or district.

Some PHCs have already established their organizational structure and include a PHC Management Information System (SIMPUS) or PHC Information System. This was also committed to MoH regulation. Commitment, backed up by sustainable funding, is required for the implementation of electronic HIS (eHealth) (Kazi, 2014). This was also supported by the opinion, which stated that the dimension of information system management involves leadership, strategy, and management behavior.

The man factor revealed that not all MRO had received application-specific training. The results of this study showed that human resources development was needed through training activities. The study is in line with the regulation stated by the MoH that education and training should be conducted to develop human resources who manage the PHC information system (Fitriana et al., 2020). Applicative and appropriate continuous learning were needed to provide competitive learning. This thing will cause human resources to have ability and work results based on standards (Fahmi, 2016).

Regarding funding, the study showed there is no supporting funding for conducting socialization and training in implementing an online registration system. This is inconsistent with MoH regulations, which state that funding for HIS includes the development of management officers who are educated and/or trained in PHC information systems. Funding support was very important in the implementation of Electronic HIS (*eHealth*). This is supported by other studies which state that sustainable funding is needed (Kazi, 2014).

The readiness of the facility showed that 80% of the computers in PHC already fulfill the needs and are connected to the internet. In addition, all PHCs already had supported hardware (printer, cable, internet network, internet server). This is consistent with MoH regulation that states all PHCs must provide facilities to implement PHC information systems.

The facility included recording and reporting equipment, computers, and supporting facilities. Moreover, the implementation of an electronic PHC information system should provide applications, an internet network, and a local network. This is also in line with a theory that states that the technology dimension consists of computer hardware, software, management technology, and telecommunications/networks (including the internet)(Laudon & Laudon, 2014).

From the material side, all PHCs already had an internet network with computer specifications such as database program servers DBL SQL, and Java applications that

support the implementation of the online registration system. Regarding the readiness of other software, almost all PHCs (80%) already had it to support PHC services. This is consistent with MoH regulations requiring that the applications used in the implementation of HIS be interconnected and integrated into national HIS (Fitriana et al., 2020). A previous study showed that an online registration system was developed using the database program Server DBL SQL and Java application (Jaliyanti, 2018) (Agastya & Fanida, 2016).

CONCLUSION

All PHCs and patients were ready to use online registration. Supporting funding is needed to conduct socialization and training for MRO to implement online registration. In addition, funding for the maintenance of facilities and infrastructure is also needed. Nevertheless, there were still insufficient support methods or internal policies from DHO. According to this study, all PHCs should be ready to prepare operational policies, facilities, and infrastructure to implement online registration.

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