



The Influence of Implementing an Online Registration System Through the Application On Reducing Queues at The Bandung Muhammadiyah Hospital

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Abstract

This research is a qualitative study with a phenomenological approach using interview and survey data collection techniques that aim to gain an in-depth understanding of the patient experience in online hospital registration. The research participants included staff, patients, and patients' families who used the online registration system at Muhammadiyah Bandung Hospital. The results of this study show that patients' experiences with the online registration system include phenomenological aspects. Patients described changes to registration, including ease of access, flexibility of scheduling, and ease of registration through the application or hospital website. It was stated that patients could register online at any time if they wanted to visit. In addition, some patients experienced difficulties in using the online registration system. For example, the clinic you want to visit has a limited quota, the doctor's schedule is not updated, or other obstacles. The use of an online registration system also has benefits in reducing queues at the hospital. Patients said they could avoid long queues and shorten waiting times by registering themselves online. The study concluded that patients' experiences with online registration involved changes in access, control, and waiting time. Although there were some challenges, patients found solutions and benefits in the online registration system. This study highlights the importance of continuously improving technical, interface, and user experience improvements to provide patients with a better experience when using the online registration system.

Keywords: Online registration, patient experience, information system, phenomenology

1. Introduction

A hospital is a service institution that provides comprehensive healthcare services to individuals. It offers a full range of services including inpatient, outpatient, and emergency care. Hospital outpatient registration services are the first step in gaining access to necessary medical services in an efficient and organized manner (1).

Hospital information systems play an important role in managing online registration and are able to provide fast and accurate information, SIMRS (Hospital Management Information System) is designed to encourage increased efficiency and effectiveness of services in hospitals. The smooth flow of information is necessary for hospital operations. Ease of access to information provided by the hospital, implementation of a good information system through the planning process can potentially increase patient satisfaction (2).

Online registration is a way to make it easier for patients to carry out the registration process at the Muhammadiyah Bandung Hospital, aiming to improve public health services

for waiting times and patient queues in the outpatient registration section. The problem is often a very serious problem for customers visiting the hospital because of the long queue waiting time so that it can be a less pleasant experience for some patients. Online registration is a registration method using mobile phone-based technology that allows patients to avoid long queues at the hospital. Previously, patients had to queue at the hospital to get a queue number manually (3). In addition, irregular queues can also interfere with hospital efficiency and productivity. Therefore, the implementation of an online registration system can break down the problems that arise so that it can help provide solutions to overcome the problem of queue buildup.

Queuing system is a service system that can help improve the quality of service to the community to avoid long queues and long waiting times during the queuing process to get services. Be it banking services, hospitals, immigration, and so on. The existence of a registration and queuing system also teaches the public that those who come first will be prioritised to be served according to (4).

Patient registration is a crucial component in hospital health services. The efficiency and accuracy of registration is very important in providing quality care. In today's digital era, Muhammadiyah Bandung Hospital realises the importance of integrating information technology to improve health services. Muhammadiyah Bandung Hospital has adopted an online registration system to reduce queues and waiting time at the registration counter, as well as allowing patients to register online before their hospital visit (5).

With the advancing digital era, technology has brought significant changes to several aspects of life including in the world of health. the development of digital technology in society has resulted in the digitalisation transformation of health services to be more efficient and affordable for the community. However, medical records need to implement electronic health services with the principles of security, confidentiality of data and information being very important (6).

One of the innovations that has been introduced in various hospitals including the Muhammadiyah Bandung Hospital is online registration through the JKN (National Health Insurance) Mobile application, Hospital Registration Website and APM (Anjungan Pendaftaran Mandiri) self-registration system through BPJS (Badan Penyelenggara Jaminan Social) which is established in various hospitals to register for a facility referral letter or patient control letter to the intended poly, patients no longer need to register fingerprints to the outpatient counter, this system aims to provide convenience and comfort to patients in carrying out the registration process without having to queue for a long time. By using smartphones and computers, patients can register easily and quickly, whenever and wherever they are (7).

Based on the above background, the authors are interested in conducting research on "The Influence of Implementing an Online Registration System Through Applications on Queue Reduction at Muhammadiyah Bandung Hospital". The purpose of this study is to deeply examine the impact and effectiveness of implementing an online registration system through an application on queue reduction at the Muhammadiyah Bandung Hospital.

2. Methods

This research method uses qualitative phenomenology to understand the patient's experience in using online registration and its effect on reducing queues at the hospital. The

phenomenological qualitative approach was chosen because this research aims to describe and explain the phenomenon of online registration and queue reduction in detail.

This study was conducted at the Muhammadiyah Bandung Hospital, one of the public hospitals that established an online registration system through the application (Mobile JKN), (Website) registration and (APM). by involving participants consisting of patients who have used the online registration system.

Data sources were collected through interviews and questionnaires distributed through participants who have used the online registration system at the hospital. The survey was designed to collect qualitative data describing participants' experiences and perceptions related to online registration and queue reduction at Bandung Muhammadiyah Hospital.

3. Results and Discussion

This study involved 10 participants (7 women and 3 men) aged between 20 - 56 years old who lived in the Bandung area. Three participants had a diploma III education, one participant worked as a teacher, four participants were hospital staff and two participants did not work. Participants who use the online registration system and those who do not use this online registration system, including 6 people are patients who have used the online registration system, 4 people are patient companions and have never used the online registration system in the hospital.

Five themes were generated as follows:

- 1) How about your experience in using the online registration system at the hospital.
"I have a pretty good experience regarding online registration at this hospital. Because with online registration it becomes more efficient through the Mobile JKN application and there is no need to register directly to get a queue number"

The experience of the six participants with the online registration system was that the system helped patients with both the queue number and the registration of the intended polyclinic.

While four participants have never used the online registration system through the JKN Mobile application, there are two opinions that say because they are accustomed to registering directly to the hospital and do not know how to register using the JKN Mobile application.

- 2) Have you experienced any difficulties that you faced while using the online registration system.

"At first, I had some difficulties installing the online registration application on my phone. However, after getting help from the information staff, the problem was solved and I was able to use the online registration system easily."

Some participants had difficulty using the Mobile JKN application for the first time, as many patients did not know how to register on the application. Responses from some other participants also pointed out other difficulties, such as queue numbers being irregular or improperly placed, and doctors' practice schedules not being updated by the hospital, leading some patients to register directly at the hospital.

- 3) Does the online registration system through APM help you reduce waiting time at the hospital.

"I feel helped by the existence of APM so I don't have to wait long for the counter queue"

Some participation is helped by the existence of APM, although there is no need to wait in the lobby of the outpatient counter to register for the polyclinic to be addressed, but not all patients can register at APM, APM is only intended for patients who will control or refer to health facilities on the same date.

In addition, two participants said that patients sometimes still find it difficult to use the APM, sometimes there is a system *error* or they still need help from the security guard to register to the intended polyclinic section, because there is still a lack of information for patients or the public regarding APM.

4) How do you respond to the problems of online registration applications in this hospital.

"When I want to register online, I sometimes still find it difficult, because it is difficult if I want to register to the poly section that I want to go to"

Patients still get difficulties and errors in online registration at Muhammadiyah Bandung Hospital, in terms of patient registration to the intended polyclinic. There are also participants who say the online registration application gives the same queue number to several patients who register online or the number that does not change is always number one even though there are other patients who get the number.

5) Do you have any suggestions or recommendations to improve this online registration system.

"I hope it will be considered to improve the *up-to-date* online registration application, *responsiveness*, and speed of this online registration application"

All participants gave similar suggestions that online registration such as Mobile JKN still has difficulties in the doctor's schedule, the polyclinic that the patient will go to, the occurrence of system *errors* on Mobile JKN, and the lack of *responsiveness* to online registration problems.

The use of information and communication technology is essential in many aspects of life today. The development of information and technology has fuelled the adoption of new ways of life, affecting all stages from start to finish with significant electronic influences. Advanced technology has been applied in the economy, health, industry, and also in government. The application of information and communication technology, in particular, has been utilised by agencies and organisations to improve efficiency in the administration of data processing and retrieval which has an impact on improving the quality of public services that are more effective, transparent and accountable. Therefore, it is important for agencies and organisations to adapt to current technological developments in order to effectively apply them in the work environment (8). According to a study conducted by Shalihin et al. in 2022, there are differences between offline registration systems and online registration systems. In offline registration, staff work more, patient waiting time is longer, and registration services are limited according to hospital operating hours. Patients must come to the hospital to register. Whereas in online registration, the officer's work becomes easier despite a little extra, with the development of an online queuing system based on an online or mobile JKN portal, hospital website and SMS (WhatsApp and Telegram). The patient's waiting time is shorter, the registration process becomes easier and simpler, and patients can register without having to come directly to the hospital (9).

Online registration allows patients to register anywhere and anytime. The process of verifying patient files is done online so that patients no longer need to queue at manual registration counters. A centralised queue control system that can be implemented in hospitals with many different departments or sections. The system can handle a large number of sections, where each section can have multiple servers. The system configuration can be set via the control panel. The system is designed to operate over the internet because each section is located in different parts of the building or even different geographical areas, and patients are often outside the hospital area (10). With the widespread use of mobile devices and technology in various places, the need for a smart and efficient Queue Management System (QMS) has become essential to improve patient experience and optimise hospital performance in efficient healthcare delivery. It can reduce queues at manual counters, save patient waiting time, and reduce the possibility of mismanagement of patient files in hospitals. This process also speeds up services at the polyclinic because online registration applications are easier and faster than manual registration. The preparation and distribution of patient medical record files from manual registration counters to polyclinics takes a considerable amount of time, often causing delays in polyclinic services and increasing patient waiting time. With online registration, the distribution of patient medical record files can be done by the filling staff in the morning, minimising service delays at the polyclinic (11).

In his research, Wangrakdiskul analysed queuing theory and examples of its application in public hospitals in Thailand. The aim is to reduce waiting time and improve the quality of health services. Wangrakdiskul proposed a model that considers social cognitive approaches as well as patient waiting time in the queue management system, hoping to improve efficiency and patient experience in receiving healthcare services (12).

The World Health Organisation (WHO) identifies patient waiting time for health services as one of the key measures of health system responsiveness. The Patient's Charter of the United Kingdom Government sets out a set of standards stating that every patient should be seen within 30 minutes of their appointment. Globally, it has been agreed that a good healthcare management system should not keep patients waiting too long for medical appointments and consultations (13). Patient waiting time is one of the aspects assessed in hospital performance index and patient satisfaction. High service variation can affect waiting times, which are influenced by factors such as the 5Ms (people, materials, machines, methods, money). Human factors relate to employee discipline in the process of providing medical record files on time, neat storage, and timely return. Material factors include the availability and orderliness of medical record files, including the replacement of damaged files to maintain confidentiality and facilitate searches. Method factors involve a clear outpatient registration flow for all hospital staff, to prevent patient confusion at the registration counter. Machine factors relate to the hospital management information system (SIMRS) and the Pcare application for BPJS patients, which can experience disruptions and slow down services. The money factor includes incentives to increase the motivation of medical record officers in carrying out their duties (14).

Muhammadiyah Bandung Hospital has implemented online registration, but in practice it faces several obstacles. One of the main obstacles is that there are still many patients who are not familiar with technology, so those who arrive early can get a queue number later. Hospitals can provide training or education on the online registration system to help patients understand and use the online registration system better. Hospital

administrators, doctors, and managers are constantly trying to find ways to improve the speed of service, as they believe that long queues can negatively impact their future judgement (15). Clearly understanding where hospital inefficiencies occur and how to fix them is of key importance in formulating healthcare policies and making budget-related decisions. Collecting feedback from patients on a regular basis about their experience with the online registration.

Conclusions

Based on phenomenological qualitative research on online registration at Muhammadiyah Bandung Hospital, the online registration system has the potential to improve efficiency and patient experience. The use of an online registration system can reduce waiting time for patient queues at the hospital and provide convenience to patients in making registrations.

Although there are some problems that arise when using an online registration system. These problems include technical problems, difficulties in registering patients for queue numbers, difficulties in registering patients to the intended polyclinic, and limited information. Addressing these issues, the hospital needs to improve and enhance the implementation of the online registration system. Possible solutions include providing technical guidance for users, providing patient education and training, collecting patient feedback, and strengthening the registration system.

These improvements and enhancements will make the hospital's online registration system more effective and efficient, providing a better experience for patients. This will help improve the overall quality of medical services.

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Conflicts of Interest

The authors declare no conflict of interest.

References

1. Kemenkes RI. Permenkes No 3 Tahun 2020 Tentang Klasifikasi dan Perizinan Rumah Sakit. Tentang Klasifikasi dan Perizinan Rumah Sakit. 2020;(3):1–80.
2. Sari MM, Sanjaya GY, Meliala A. Evaluasi Sistem Informasi Manajemen Rumah Sakit (SIMRS) Dengan Kerangka HOT - FIT. Seminar Nasional Teknologi Informasi Inonesia. 2016;1(1):203–7.
3. Rohman H, Marsilah M. Pemanfaatan Sistem Pendaftaran Online Melalui Aplikasi WhatsApp di Rumah Sakit Umum Daerah. Indonesian of Health Information Management Journal (INOHIM). 2022 Jun 30;10(1):18–26.
4. Zhong X. A queueing approach for appointment capacity planning in primary care clinics with electronic visits. *TRANSAKSI IISE*. 2016 Oct 26;50(11):970–88.
5. Almomani I, AlSarheed A. Enhancing outpatient clinics management software by reducing patients' waiting time. *J Infect Public Health*. 2016 Nov 1;9(6):734–43.

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6. Menteri Kesehatan. Peraturan Menteri Kesehatan RI No 24 tahun 2022 tentang RekaM Medis. peraturan menteri kesehatan Republik Indonesia Nomor 24 tahun 2022. 2022;15(2):10–7.
 7. Trish EE, Herring JB. How do health insurer market concentration and bargaining power with hospitals affect health insurance premiums? *J Health Econ.* 2015 Jul;42:104–14.
 8. Zhang M, Zhang C, Sun Q, Cai Q, Yang H, Zhang Y. Questionnaire survey about use of an online appointment booking system in one large tertiary public hospital outpatient service center in China. Vol. 14, *BMC Medical Informatics and Decision Making.* BioMed Central Ltd; 2014.
 9. Lin FC, Fu CY, Fu SC. Minimal Human Interaction in hospitak:effective online registration system design. *Sage journal.* 2022 Sep 21;12(3).
 10. Ojochogwu Egbunu C, Onyekwere O, Adeiza Rufai M, Simon Yange T, Pascal Atsanan S. Que Management in Non Tertiary Hospitals for improved Health Service Delivery to Outpatients [Internet]. Vol. 12, *International Journal of Applied Information Systems (IJ AIS).* 2020 Jul. Available from: www.ijais.org
 11. Naiker U, FitzGerald G, Dulhunty JM, Rosemann M. Time to wait: A systematic review of strategies that affect out-patient waiting times. Vol. 42, *Australian Health Review.* CSIRO; 2018. p. 286–93.
 12. Bakari HR, Chamalwa HA, Baba AM. Queuing Process and Its Application to Customer Service Delivery (A Case study of Fidelity Bank Plc, Maiduguri) [Internet]. Vol. 2, *International Journal of Mathematics and Statistics Invention (IJMSI)* E-ISSN. 2014. Available from: www.ijmsi.org
 13. Mohebbifar R, Hasanpoor E, Mohseni M, Sokhanvar M, Khosravizadeh O, Ishafani MH. Outpatient Waiting Time in Health Service and teaching Hospital: A Case Study in Iran. *Glob J Health Sci.* 2014 Jan 10;6(1):172–80.
 14. Injete MJ. Influence of registration process in health insurance utilization among nhif members in isiolo county. *KemMU;* 2022 Oct.
 15. Peter PO, Sivasamy R. Queueing theory techniques and its real applications to health care systems–Outpatient visits. *Int J Healthc Manag.* 2021;14(1):114–22.