

The Effectiveness Of Patient Portals In Improving Access To Personal Medical Records

Ahmad Saleh Mohamed Sayed, Shama Rshaid Bin Zwayed, Ahmed Abdulrahman Alkharyif, Nourah Naif Algethmi, Ibtisam Dahesh Al-Amri, Laila Muhammad Suleiman Al-Juhani, Bandar Abdullah Ratiman Aljuhani, Abrar Hassan Muawwadh, Apdoilh Badi Alotaibi, Ahlam Abdullah Ibrahim Aqeel, Abdulrahman Saud Ibrahim Aldhaban

Abstract

Involving patients in the provision of healthcare has the capacity to enhance health results and increase patient contentment. Patient portals may promote patient involvement by allowing patients to access their electronic medical records (EMRs) and permitting secure communication between patients and healthcare providers. The objective of this study was to analyze existing literature that discusses patient portals connected to an electronic medical record (EMR) in hospital settings. The study aimed to examine the role of these portals in promoting patient engagement and their influence on healthcare delivery. The purpose was to identify key factors and recommended strategies for effectively implementing this technology, as well as areas that necessitate additional research. A comprehensive search for papers was performed in the PubMed, CINAHL, and Embase databases using relevant keywords related to patient engagement, electronic health records, and patient portals, along with their corresponding topic headings in each database. Specifically, some patients expressed a desire for unrestricted access to their electronic medical records (EMRs), personalized health education, and nonclinical information. Additionally, patients showed a strong interest in using portals as a means of communication with their healthcare teams. Within the outputs category, several studies discovered that patient portals enhanced patient engagement to varying degrees. Patients reported certain portal functions as insufficient while finding others to be beneficial. Both patients and staff believed that portals had the potential to enhance patient care, although they acknowledged that some patients might experience anxiety as a result. Furthermore, patient portals were found to improve patient safety, medication adherence, and communication between patients and healthcare providers. However, their impact on objective health outcomes was found to be negligible. Although the data is presently limited, patient portals have shown advantages by facilitating the identification of medical mistakes, enhancing medication adherence, and increasing communication between patients and healthcare providers, among other benefits. Comprehensive research is required to have a complete understanding, enhance, and assess their influence.

Keywords: patient portal, electronic medical record (EMR), digital interface for patients, digital hospital, efficiency.

1. Introduction

Hospitals' growing use of electronic medical records (EMRs) offers patients the chance to get their clinical data and actively engage in their healthcare via the EMR. Patient portals may be used by hospitals and other healthcare organizations to enhance patient access to

their electronic medical record (EMR) data. Patient portals provide a safe and online means of accessing personal health information, including prescription lists, test results, vaccinations, allergies, and discharge information. In addition, they have the capability to facilitate communication between patients and healthcare providers via encrypted messaging, appointment and payment management, as well as medication refill requests [2,3].

One reason for the rise in patient portal deployment is the presence of initial data suggesting that they may enhance patient involvement [4] and improve health outcomes, such as medication adherence [5-10]. Government incentive programs and laws have also exerted influence on some health care companies, prompting them to adopt patient portals [11,12]. For instance, in the United States, the use of patient portals was a means to fulfill the criteria for Meaningful Use, Stage 2, of the Healthcare Information Technology for Economic and Clinical Health Act [13].

Encouraging patient engagement in health care delivery might potentially enhance the quality and safety of treatment [14,15] by empowering people to identify and report problems in electronic medical records (EMRs), for instance [6]. Several individuals acknowledge the significance of patient portals in their healthcare, expressing contentment with the capability to interact with their healthcare providers and carry out chores like seeking medication refills effortlessly [3,16]. Utilization of portals has the potential to decrease in-person visits, trips to emergency rooms, and patient-provider telephone talks [3,8-10,12,16]. Although portals have been used in the ambulatory sector for a while, their application in the inpatient situation has just lately gained traction [17-19]. Implementing patient portals in the hospital context poses additional obstacles [18,20]. Patients who are hospitalized due to clinical illnesses typically have acute episodes, resulting in a significant volume of medical information being created. This abundance of information may overwhelm patients and provide a challenge for information technology systems to efficiently present it in a timely manner.

The objective of this study was to analyze existing literature that discusses patient portals connected to an electronic medical record (EMR) in hospital settings. The study aimed to understand the role of these portals in engaging patients and their influence on healthcare delivery. The goal was to identify key factors and best practices for effectively implementing this technology, as well as areas that need additional research. The purpose of our evaluation is to provide information to academics, health care organizations, and policymakers.

2. Methods

Articles pertaining to patient engagement, electronic health records, patient portals, and their associated topic headings were searched for in the PubMed, CINAHL, and Embase databases using relevant keywords.

3. Analysis

This systematic review analyzed 58 studies that investigated the use of inpatient portals. While there were similarities in the topics explored in these research, there were also notable differences in the environment, patient demographic, software, outcomes evaluated, and study technique. This diversity makes it difficult to reach a firm conclusion about the effectiveness of inpatient portals. This is further shown by the greater number of included studies that were deemed to convey mixed valence compared to those with a positive valence. Nevertheless, a greater number of research demonstrated a positive rather than negative impact, indicating that patient portals may have advantageous effects on healthcare. Below, we examine the elements related to patient portal input, process, and

output that contribute to this evaluation, as well as the specific areas of research that need attention in order to enhance patient care.

4. Inputs for the patient portal

When evaluating prevalent themes in the inputs area, there was more emphasis on portal design, usability, and hurdles compared to user training and organizational aspects. Multiple papers have shown that effective portal design is essential for enhancing usability and encouraging patient uptake. Although several research have included users in the design process, further efforts are required to address design-related obstacles, especially for those with little health literacy [6,19,24]. Expanding the use of facilitating technology, such as voice-activated digital assistants, artificial intelligence, and natural language processing, has the potential to broaden the systems' appeal to a more diverse set of users. Enabling portal adoption might be facilitated by designing platforms to be compatible with users' own mobile devices.

Patients' apprehensions about the confidentiality and protection of their medical data [34,40] are especially pertinent in situations when healthcare providers need access to patients' electronic medical records (EMRs). The literature provides scant discussion on privacy concerns with caregiver access to patient medical information. Without a defined policy for caregiver access, patients may choose to share their personal log-in information with their caregivers, a practice that is not advisable [26].

The findings from the user training demonstrated that depending only on a standardized method may not provide desirable outcomes in user education due to the diverse range of preferences. Training might be improved by offering targeted knowledge that specifically addresses prevalent patient issues, such as information security, as well as addressing the concerns of healthcare professionals, such as changes in workflow.

The literature lacks information about the optimal time for delivering training material to patients. Prior to implementing a patient portal, it is possible to provide staff training in advance. However, patients will only come across a portal when they are admitted to the hospital. Moreover, the gravity of their condition may impede their capacity to concentrate on or comprehend the instruction information. Prior to hospitalization, it may be necessary to use innovation in order to educate patients about portal services. Patients may enroll in outpatient portals that have a comparable design to the inpatient portals, ensuring a smooth transition between the two. Hospitals should establish partnerships with medical insurance carriers to provide training resources to prospective patients who are enrolling in hospital insurance.

5. Procedures for the Patient Portal

Research has shown that there are connections between patient sociodemographic factors and the use of online patient portals [4,6]. These findings suggest that those who are most susceptible (such as those with little health literacy or severe illness) are less likely to get advantages from using patient portals. The presence of recruitment and participation bias in user testing might lead to a discrepancy between the actual usage of a product by patients and its use during the first testing stages. Thus, health care organizations may need to carry out several research in order to systematically address the issues that impact the use of portals among the populations they cater to.

The divergent patient preferences on the extent of access to electronic medical records (EMRs) [6,18,24,26,30] and the apprehensions of staff over unrestricted patient access to confidential information (information that may induce anxiety in patients) [24] pose difficulties for healthcare organizations. Health care organizations may meet these various information requirements by identifying sensitive information and notifying patients that,

even though they have access to the information, they have the option to receive it in person from a member of the health care team. Several hospitals have established protocols for disclosing confidential data via outpatient portals [26], and these protocols might be modified for use in the inpatient context.

Health care organizations may see patient demands for nonclinical information and functionalities, such as electronic games [18,19,24,30], as peripheral requests that might increase developmental expenses. However, fulfilling these demands has the potential to enhance the adoption and use of the portal, leading to an overall increase in patient satisfaction. Furthermore, although consumers have shown a need for background information about their healthcare providers, it is unclear how healthcare workers feel about sharing such information with their patients [19,24]. Additional study is required to investigate the staff's perspectives on this matter and to examine strategies for providing this service.

Utilizing portals for patient-provider contact has the potential to be advantageous, but it may also cause disruptions [26]. While initial worries about disruptions from continuous patient messaging did not come to fruition, in reality, staff personnel may still be inundated with messages at any one moment. Structured messaging may be an effective method to guarantee that patients only transmit essential and relevant information [26]. If health care organizations want to use structured messaging, they should give priority to patient safety and hence refrain from imposing limitations that might hinder patients from expressing legitimate concerns.

6. Outputs from the patient portal

The research examined some, but not all, possible outcomes of patient portal installations. The majority of the research evaluated the adoption of patient portals by examining interim outcomes such as user perceptions. However, only a small number of studies focused on crucial objective outcomes such as length of stay, morbidity, or death [2,4,20].

Several studies have shown no correlation between the usage of a portal and health outcomes such as readmission, adverse events, or death [2,4,20]. Nevertheless, some of those studies based their findings only on retrospective analysis of portal adoption and use data [4,20]. It is important to note that the mere adoption and frequency of use do not provide enough information about the effectiveness of portal usage, which might have an impact on outcomes.

While patient engagement is a primary objective of patient portals, it is equally crucial to ensure that healthcare professionals are also engaged, since they are likely to be the ones contacted by patients with inquiries relating to the portal [5]. Nurses and physicians should possess the expertise to address fundamental inquiries or effectively escalate intricate inquiries (e.g., to information technology support). In addition, nurses may be obligated to promptly address patient-generated communications inside the portal. Equally essential are physicians' impressions of portals, since they may use a portal for patient communication [5] and so need a strong understanding of its functionalities. Healthcare information technology theories propose that user perceptions might serve as indicators for the acceptability and use of new technologies. Consequently, it is crucial for hospitals to guarantee favorable staff attitudes towards patient portals by implementing efficient staff training and technical assistance, as well as by integrating staff requirements into portal design and operations.

Multiple studies have shown that patient portals aid patients in identifying inaccuracies in electronic medical records (EMRs) [24,26,30]. The research lacks discussion on how patients might effectively inform healthcare professionals about such mistakes. Additional investigation is required to determine the reporting of mistakes detected by patients and to

find the most effective techniques for reporting. Currently, there is insufficient research on the assessment of patient portals. There is a need for standardized assessment frameworks and measurements in order to provide more accurate comparisons of patient portal deployment and results in the future.

7. Conclusion

The study findings indicate that the existing evidence for inpatient portals is now underdeveloped. Comprehensive evaluation of the effects of these portals necessitates the implementation of standardized outcomes assessment and an increase in high-quality research that use objective measures such as length of stay, mortality, and morbidity.

References

1. Office of the National Coordinator for Health Information Technology. 2017. What is a patient portal? URL: <https://www.healthit.gov/faq/what-patient-portal> [accessed 2019-03-12]
2. Griffin A, Skinner A, Thornhill J, Weinberger M. Patient portals: Who uses them? What features do they use? And do they reduce hospital readmissions? *Appl Clin Inform* 2016;7(2):489-501.
3. Kruse CS, Bolton K, Freriks G. The effect of patient portals on quality outcomes and its implications to meaningful use: a systematic review. *J Med Internet Res* 2015;17(2):e44
4. Aljabri D, Dumitrascu A, Burton MC, White L, Khan M, Xirasagar S, et al. Patient portal adoption and use by hospitalized cancer patients: a retrospective study of its impact on adverse events, utilization, and patient satisfaction. *BMC Med Inform Decis Mak* 2018 Jul 27;18(1):70
5. Hefner JL, Sieck CJ, Walker DM, Huerta TR, McAlearney AS. System-wide inpatient portal implementation: survey of health care team perceptions. *JMIR Med Inform* 2017 Sep 14;5(3):e31
6. Kelly MM, Coller RJ, Hoonakker PL. Inpatient portals for hospitalized patients and caregivers: a systematic review. *J Hosp Med* 2018 Dec 01;13(6):405-412.
7. Otte-Trojel T, de Bont A, Rundall TG, van de Klundert J. What do we know about developing patient portals? A systematic literature review. *J Am Med Inform Assoc* 2016 Apr;23(e1):e162-e168
8. Otte-Trojel T, de Bont A, Rundall TG, van de Klundert J. How outcomes are achieved through patient portals: a realist review. *J Am Med Inform Assoc* 2014 Jul;21(4):751-757.
9. Ammenwerth E, Schnell-Inderst P, Hoerbst A. The impact of electronic patient portals on patient care: a systematic review of controlled trials. *J Med Internet Res* 2012;14(6):325-327
10. Goldzweig CL, Orshansky G, Paige NM, Towfigh AA, Haggstrom DA, Miake-Lye I, et al. Electronic patient portals: evidence on health outcomes, satisfaction, efficiency, and attitudes: a systematic review. *Ann Intern Med* 2013 Nov 19;159(10):677-687
11. Reed P, Conrad DA, Hernandez SE, Watts C, Marcus-Smith M. Innovation in patient-centered care: lessons from a qualitative study of innovative health care organizations in Washington State. *BMC Fam Pract* 2012 Dec 14;13:120
12. Australian Commission on Safety and Quality in Healthcare. 2018. Impact of digital health on the safety and quality of health care URL: <https://tinyurl.com/y9puca9o> [accessed 2018-10-19]
13. National Learning Consortium. 2013. How to optimize patient portals for patient engagement and meet meaningful use requirement URL: https://www.healthit.gov/sites/default/files/nlc_how_to_optimizepatientportals_for_patientengagement.pdf [accessed 2019-03-12]
14. Little P, Everitt H, Williamson I, Warner G, Moore M, Gould C, et al. Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations. *BMJ* 2001 Oct 20;323(7318):908-911
15. Stewart M, Brown JB, Donner A, McWhinney IR, Oates J, Weston WW, et al. The impact of patient-centered care on outcomes. *J Fam Pract* 2000 Sep;49(9):796-804.
16. Irizarry T, DeVito DA, Curran CR. Patient portals and patient engagement: a state of the science review. *J Med Internet Res* 2015;17(6):e148

17. O'Leary KJ, Lohman ME, Culver E, Killarney A, Randy SG, Liebovitz DM. The effect of tablet computers with a mobile patient portal application on hospitalized patients' knowledge and activation. *J Am Med Inform Assoc* 2016 Jan;23(1):159-165.
18. Prey JE, Woollen J, Wilcox L, Sackeim AD, Hripcsak G, Bakken S, et al. Patient engagement in the inpatient setting: a systematic review. *J Am Med Inform Assoc* 2014;21(4):742-750
19. Vawdrey DK, Wilcox LG, Collins SA, Bakken S, Feiner S, Boyer A, et al. A tablet computer application for patients to participate in their hospital care. *AMIA Annu Symp Proc* 2011;2011:1428-1435
20. Dumitrascu AG, Burton MC, Dawson NL, Thomas CS, Nordan LM, Greig HE, et al. Patient portal use and hospital outcomes. *J Am Med Inform Assoc* 2018 Apr 01;25(4):447-453.
21. Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, et al. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ* 2017 Dec 21;358:j4008
22. Sirriyeh R, Lawton R, Gardner P, Armitage G. Reviewing studies with diverse designs: the development and evaluation of a new tool. *J Eval Clin Pract* 2012 Aug;18(4):746-752.
23. de Matos CA, Rossi CAV. Word-of-mouth communications in marketing: a meta-analytic review of the antecedents and moderators. *J Acad Mark Sci* 2008 Sep 23;36(4):578-596.
24. Woollen J, Prey J, Wilcox L, Sackeim A, Restaino S, Raza ST, et al. Patient experiences using an inpatient personal health record. *Appl Clin Inform* 2016;7(2):446-460
25. Borbolla D, Del Fiol G, Taliercio V, Otero C, Campos F, Martinez M, et al. Integrating personalized health information from MedlinePlus in a patient portal. *Stud Health Technol Inform* 2014;205:348-352.
26. Grossman LV, Choi SW, Collins S, Dykes PC, O'Leary KJ, Rizer M, et al. Implementation of acute care patient portals: recommendations on utility and use from six early adopters. *J Am Med Inform Assoc* 2018 Apr 01;25(4):370-379.
27. Lister Hill National Center for Biomedical Communications, NLM. 2016. Infobuttons URL: <https://lhncbc.nlm.nih.gov/project/infobuttons> [accessed 2018-10-19]
28. Arnold CW, McNamara M, El-Saden S, Chen S, Taira RK, Bui AAT. Imaging informatics for consumer health: towards a radiology patient portal. *J Am Med Inform Assoc* 2013;20(6):1028-1036
29. Lee J, Kim JGB, Jin M, Ahn K, Kim B, Kim S, et al. Beneficial effects of two types of personal health record services connected with electronic medical records within the hospital setting. *Comput Inform Nurs* 2017 Nov;35(11):574-581.
30. Kelly MM, Hoonakker PLT, Dean SM. Using an inpatient portal to engage families in pediatric hospital care. *J Am Med Inform Assoc* 2017 Dec;24(1):153-161.