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Use of Electronic Patient Portals in Pregnancy: An Overview

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Abstract

Electronic patient portals are increasingly utilized in contemporary health care systems. Patient portal use has been found to be beneficial in multiple specialties, particularly in management of chronic diseases. However, there are disparities within portal use. For example, individuals who are racial and ethnic minorities and persons from lower socioeconomic status are less likely to enroll and use patient portals than non-Hispanic white persons and persons with higher socioeconomic status. Because portal use and, specifically, patient-provider secure messaging has been associated with favorable health outcomes, disparities in use of these portals could affect health outcomes. Electronic patient portal use by childbearing women has not been well studied, and data on portal use during pregnancy are limited. This article reviews the current literature regarding electronic patient portal use and highlights the need for further maternity care-focused research regarding this new avenue of care delivery during pregnancy.

Keywords

electronic patient portal; health disparities; maternity care; clinical outcomes

INTRODUCTION

Use of online patient portal services in the electronic health record has become common. A patient portal is a website directly tethered to an electronic health record that provides personal health records through a secure online platform.¹ Portals allow individuals to readily communicate with health care providers and become active participants in their health care via multiple functions. Individuals are able to view portions of their health record, including laboratory results, discharge summaries, and medical history; schedule appointments; refill prescriptions; and communicate with health care providers within the secure confines of the portal interface.² Documentation of portal communication typically becomes included in the person's health record. Given the rising popularity of patient

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CONFLICT OF INTEREST

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portals, the aim of this review is to explore the implications of portal use and how it can potentially impact maternity care.

BACKGROUND

Patient portal use emerged as a strategy designed to engage individuals in their health care, with the goal of creating partnerships between health care providers that lead to competent, well-informed decisions.¹ Patient portals were first introduced in the 1990s and became more widespread in 2006 as a result of advances in technology that coincided with health care insurance plans contracting with data sharing programs.¹ These measures, along with an overall cultural shift toward technology and readily accessible information, laid the groundwork for patient portals to play a role in health care delivery.

The Health Information Technology for Economic and Clinical Health Act in 2009 created the Electronic Health Record Incentive Programs and required meaningful use to promote the effective adoption of health information technology.³ *Meaningful use* is defined as “using electronic health record to improve quality, safety, efficiency, and reduce health disparities; engage patients and family; improve care coordination, and population and public health; and maintain privacy and security of patient health information.”⁴ This initiative received continued support under the 2010 Affordable Care Act.³ Currently, the expansion of patient portals is primarily due to the meaningful use criteria by the Centers for Medicare and Medicaid Services incentive program.⁴ Patient portal use is one of the features mandated by the meaningful use requirement. The overarching goal of meaningful use of electronic health records is to improve health outcomes and empower individuals. In addition to the financial support incentive, the complexity of our current health system necessitates and encourages individual engagement with care and increased communication with health care providers.

CLINICAL IMPACT OF ELECTRONIC PATIENT PORTAL USE

Numerous studies exploring the effect of patient portals on clinical care have shown portal use to be associated with positive patient outcomes.^{3,5–8} For example, a 2010 review evaluated the impact of patient portals on health outcomes in persons with diabetes.⁸ This article included 26 studies and found that portals may improve diabetes-related outcomes, patient-provider communication, access to health information, and satisfaction with care.⁸ These findings were supported by a 2016 systematic review that examined 11 studies for evidence supporting the use of patient portals in helping individuals manage diabetes. This study focused on clinical outcomes as defined by hemoglobin A1c levels.³ Seven of the 11 studies found that use of secure messaging patient portals was associated with significant improvement in hemoglobin A1c values.³ Another systematic review published in 2013 assessed the effect of patient portals on health outcomes and found the evidence to be insufficient.⁷ In this review, 46 studies with varying methodologies were included and found that in chronic diseases, management portal use combined with case management improved outcomes. However, overall this review did not find strong evidence for a beneficial impact of patient portals on measurable health outcomes, despite improved patient satisfaction and

general adherence to recommendations.⁷ This may be because the technology is new and optimal use has not yet been fully evaluated.

Secure messaging is a unique aspect of electronic patient portals that is expected to facilitate patient self-management, shared decision-making, and patient satisfaction.⁹ Secure messaging allows patients to communicate with health care providers outside of regular office visits. Through secure messaging, patients can discuss a change in condition, laboratory test results, a new condition, and prescription concerns.¹⁰ Use of this particular function has been associated with favorable clinical outcomes, specifically in research examining diabetes management.^{3,8,11–16} For example, a retrospective observational study examined health data from 6301 adults with diabetes who were registered for access to a secure electronic health record to assess differences in glycemic control associated with use of patient-provider secure messaging. In this cohort, good glycemic control (defined as hemoglobin A1c <7%) was associated with a slightly higher use of secure messaging (35% vs 30%, $P < .005$).¹³ Moreover, in adjusted multivariate analyses, it was found that increased secure messaging use had a dose-dependent effect on glycemic control; individuals with 12 or more secure messaging threads were 1.26 times (95% CI, 1.16–1.38) as likely to have hemoglobin A1c <7% compared with those with no secure messaging use, while those with only one thread were 1.05 times (95% CI, 1.02–1.09) as likely to have at-goal hemoglobin A1c values.¹³

DISPARITIES IN ELECTRONIC PATIENT PORTAL USE

Despite rapid expansion of technology in health care settings, disparities in health outcomes and care that already exist may be perpetuated by disparities in technology utilization. Racial, socioeconomic, and educational disparities, along with differences in age and health status/morbidity level, have been found in both portal registration and use of portals after registration.^{2,17–22} Specifically, a cohort study of more than 1700 individuals at Kaiser Permanente Georgia demonstrated that compared with non-Hispanic white individuals, African American participants were less likely to register for the patient portal (adjusted hazard ratio [aHR], 0.65; 95% CI, 0.55–0.78) and that these differences by race were not accounted for by differences in education, income, or internet access. Also, this study showed that individuals with internet access (aHR, 1.63; 95% CI, 1.29–2.05) and postgraduate education levels (aHR, 1.38; 95% CI, 1.12–1.69) were more likely to register for online patient portals.² These findings were supported by a case-control study in Boston that showed individuals who registered for the online portal were more likely to be non-Hispanic white, were less likely to have Medicare or Medicaid insurance, and were younger and healthier (as assessed by fewer prescription medications, medical problems, office visits, and hospitalizations) compared to non-enrollees.¹⁸ Furthermore, studies have shown that nonwhite and Hispanic persons, those with the lowest incomes, and persons who are publicly insured or uninsured were less likely to activate and subsequently use their electronic patient portal account after registration.^{17,20,21}

Such disparities likely exist for several reasons. First, disparities in individual use of the portal may stem from inherent bias in whom health care providers offer the portal to or individual attitudes toward the internet or the specific portal system.²² A 2016 national

survey study demonstrated that compared with their white and non-Hispanic counterparts, African American (10% vs 78%, $P = .006$) and Hispanic individuals (9% vs. 91%, $P < .001$) were significantly less likely to be offered online portal access by their health care provider. Additionally, individuals who are older, in poor health, and less educated were also significantly less likely to be offered access by their health care provider. These discriminated-against groups were subsequently significantly less likely to engage in the patient portal.²³ Yet, an overwhelming majority of individuals considered online access to their personal health information important with no difference noted by race or socioeconomic status.²³ Thus, any benefit associated with access to patient portals will not be accrued by those who need it and believe it beneficial if health care providers are offering access in an inconsistent, discriminatory manner.²³

Obstacles to Use of Electronic Patient Portals

Several impediments to portal access have been recognized. One is the process of registration itself. Electronic patient portal interfaces require several steps prior to achieving access, and potential barriers exist at each level. Most patient portals require an access code and registration or activation before individuals are able to log in and use the account. Typically, access codes are generated by the health care provider during an encounter, and individuals are then able to register for the portal online using the access code, as previously discussed. This system requires provider-initiated conversations as well as support and training for individuals who then receive access codes.

Individual characteristics that may affect registration and use of an electronic portal include electronic and computer literacy, health literacy and numeracy, internet access, perceived benefit of portal use, patient preferences regarding provider communication, and trust in the health care system and electronic mediums.^{17,22,24} In particular, health literacy has been shown to play a role in patient portal adoption patterns. Noblin et al conducted a cross-sectional study ($N = 562$) that examined individuals' perceived electronic health literacy, income, education, and age, and how these factors were associated with their intention to use a personal health record. They found that of those individuals who intended to register in an outpatient personal health record, 65% had a high perceived health literacy score (assessed using the eHealth Literacy Scale), whereas only 38% of those who were not intending to adopt the patient portal had high perceived health literacy ($P < .01$).²⁵ Thus, persons with high literacy may be more likely to utilize a personal health record. In considering sustained portal use and the potential impact of computer and electronic literacy, Woods et al, in a prospective study of 270 participants, showed that having internet access at home, high self-rated ability when using the internet, and high overall online ability were associated with both short- and long-term portal usage.²⁴ These studies underscore the importance of identifying and overcoming potential barriers to implementation that could dissuade persons from engaging in the patient portal.^{1,24,25}

Regarding secure messaging via patient portals, once individuals have registered, disparities in adoption of internet-based health communication have been demonstrated in persons with lower income, those with less education and low literacy, persons who are racial and ethnic minorities, and those who are uninsured.^{2,17–20} Thus, with poorer quality and quantity of

patient-provider communication, populations that already experience disparities in health and health care are again at a disadvantage in regard to electronic-based health care.

ELECTRONIC PATIENT PORTAL USE IN PREGNANCY

Patient portal use has been largely studied among non-pregnant adults, with little attention to pregnant women. In Australia, a retrospective study evaluated perinatal use and perceptions of a unique patient portal developed at Mater Mothers' Hospital.²⁶ The Mater Patient Portal was designed specifically for pregnant individuals and allowed women to complete their hospital registration form online, obtain aspects of their electronic health record, access various support tools, and submit questions.²⁶ During the one-year study period, 60% of women who were offered access to the patient portal created an account. Women who used the patient portal reported that access to their electronic health records improved their ability to understand and recall appointments with their health care provider. Also, the majority of women stated that they would use the Mater Patient Portal and electronic health record for future pregnancies.²⁶

Similarly, a randomized controlled trial in Canada evaluated the effect of providing pregnant women with secure electronic access to their antenatal health records on use of and satisfaction with web-based information.²⁷ Women who presented to prenatal care before 28 weeks' gestation were randomized to a control group (97 individuals) that could access a secure website with links to general pregnancy-related information alone (ie, gestational age-appropriate information) and a study group (96 individuals) that had access to the same website but was also able to access their antenatal records along with a care planner. Women in the portal study group had nearly 6 times the number of log-ins as the women in the general information group (10.4 vs 1.8 log-ins, $P < .001$). In addition, 84.2% of the log-ins performed by the women in the study group were to assess their individual antenatal records.²⁷

Resource and needs assessment studies have also been performed, demonstrating both high access capacity and high interest, even in populations with low income. A study of post-partum women at a safety net hospital in New York assessed whether the women had the resources to use an electronic patient portal.²⁸ Of the 100 participants surveyed, 95% had access to the internet and more than half of them used the internet to search for health-related information. Ninety-two percent of participants thought that portal functions would be useful, specifically for reviewing laboratory test results and managing appointments.²⁸ Results from these studies demonstrate that pregnant women are part of the growing number of individuals interested in online access to their health information and engaging in electronic patient portals. However, no current literature exists exploring the effects of patient portals on pregnancy outcomes.

IMPLICATIONS OF PORTAL USE IN PREGNANCY

Pregnancy is a unique time period during which individuals have access to care, interact closely and regularly with their health care provider, and are encouraged to be active participants in their care. Prenatal care provides a window of opportunity to improve health

and health behaviors; thus, it is critical that we understand how to best improve access to care, especially as electronic care delivery techniques expand. Many emerging portal technologies are attempting to address these issues, both within electronic health records and as standalone portals that are distinct from the health record. For example, BabySTEPS, a glucose tracking electronic portal system for gestational diabetes mellitus, is currently being evaluated via a randomized controlled study as an educational, communication, and monitoring tool to support glycemic control during pregnancy.²⁹ Applications such as this highlight how patient-provider electronic interfaces may be particularly useful for pregnant women. In addition to gestational diabetes, pregnancy-related issues such as hypertensive disorders, gestational weight gain, and perinatal mental health issues are areas in which portal use has not yet been investigated but can play a role in condition management, patient-provider communication, and overall satisfaction.

RECOMMENDATIONS FOR PATIENT PORTAL USE IN PREGNANCY

Patient portals are a medium that may be used to fill gaps in care outside of scheduled prenatal appointments and address specific maternal health needs. The impact of patient portals on clinical outcomes still needs to be further investigated, but as electronic health care delivery becomes more widespread, patient portals have great promise. Given that health care providers play a significant role in patient adoption of portals,²³ patient portals should be introduced and recommended to women during prenatal visits. In addition, standardized procedures within the office workflow in which all women are offered a portal access code can mitigate and potentially bypass provider-level bias. Additional client support through technical assistance to navigate the portal interface and interpret the content provided can help reduce potential barriers to care, specifically in regard to usability and utility of the portal.³⁰ Ongoing user input and assessment of the population served is essential to ensure that the portal remains accessible and beneficial to clients. In-person or virtual focus groups, online surveys, and telephone surveys are potential avenues to identify reasons for nonuse of the portal and incorporate direct feedback to encourage client retention. There is an impetus to focus on how portal use affects already substantial disparities in maternal care, patient satisfaction, and clinical outcomes in both general and high-risk pregnant populations. Further work additionally must identify reasons for portal nonuse, develop indicators of successful outcomes of portal use, and test and implement potential systems-based or provider-based interventions to increase portal use.

CONCLUSION

Use of electronic patient portals is rapidly growing in the modern health care system. Such portals allow individuals direct access to their health records and health care team and have been demonstrated to improve patient-centered outcomes among nonpregnant adults. Patient portals also have the potential to improve clinical outcomes, although the evidence for the greater part remains insufficient to date given patient portal use is still relatively new. While consistent patterns in electronic patient portal and secure messaging use are evident in nonpregnant adult populations, use of patient portals in maternity care has not been thoroughly explored. As electronic patient portals become more integrated as tools to

promote health, efforts should be made to understand the patterns of use and potential impact in pregnancy.

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Quick Points

- ◆ Use of electronic patient portals is rapidly growing in the modern health care system and has been shown to be clinically beneficial in nonpregnant adult populations.
- ◆ Racial, ethnic, socioeconomic, and educational disparities exist in portal registration and use.
- ◆ Pregnant women are part of the growing number of patients interested in online access to their health information and engaging in electronic patient portals.
- ◆ Research on patterns of use and clinical impact of portal use in pregnancy is needed.