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Evidence Scan: Technological interventions in Primary Care

Questions

What primary care based technological interventions lead to improved health and patient experience?

Answer

Mixed evidence indicates that primary care-based technologies (patient portals, mHealth technologies, telehealth, and social media) lead to improved health and patient experience. These technologies do not work for every person. More research needs to be done, especially on people's dynamic needs and preferences for these technological interventions depending on their condition(s).

Supporting evidence

We identified systematic reviews examining the impact of technology on health outcomes and patient experience for the general adult population. We found the following information by type of technology.

Patient portals
There is limited evidence on whether portals lead to improve health outcomes, partly due to the limited information reported about how portals are implemented in the health care system and patient's care experience.

- Patient portals are systems "tethered" to an EHR that generally gives users access to their medical information, allows them to enter health data, and share it with health care professionals (2014 Goldzweig). One systematic review suggests non-White patients and people who are less educated are more likely NOT to use the portal. Younger, white people with two or more comorbidities are more likely to use patient portals.

- The potential consequences of increased patient portal use is mixed. Some studies report increase patient use of secure messaging with their care team and increased phone encounters. A study evaluating portals at KPCO saw an increase in visits, phone encounters, and ED use. However, another study at KPNW found a decrease in visits and an increase in phone encounters. A study at KPWA found no increase in either visits or phone calls for patients with depression.

- Although not conclusive, potential benefits are seen when portal use is combined with additional services (e.g., interactive decision support, coaching, health-related reminders, and care management like studied in the KPWA eBP study that Bev Green, MD at KPWHRI led) for people with chronic diseases like diabetes, hypertension, and depression.

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Mobile technology/applications

Mobile health (mHealth) is often used with smoking cessation, weight loss, diet and physical activity, treatment adherence, and disease management. However, there is limited evidence on health outcome improvements from using mHealth. A recent systematic review (2017 Kashgary) suggests modest benefit from SMS text messaging in increasing appointment and medication adherence for asthma and diabetes management. There is limited evidence that interactive mobile applications improve asthma self-management and quality of life.

There is also limited evidence on specific mHealth applications, but they potentially offer convenience and possibly reduce barriers of cost of care, time, and distance from care delivery facilities. Another systematic review (2016 Whitehead) suggests that self-management apps aimed to facilitate self-management of the disease and symptoms are promising in people with chronic conditions like diabetes.

- mHealth is defined as computer programs designed to run on mobile devices (smartphones, tablets) that enable communication, provide interactive experiences, and document information. Mobile technology is a platform that is adaptable, generally low cost to the health care system, and easily accessible.

- The insufficient evidence is mostly due to lack of evidence of which features attract patients to adopt a technology and continue to use it. The systematic reviews suggest the need for more research on people's dynamic needs and preferences for mobile health technology depending on their condition(s). And one systematic review referenced that context determines if mobile technology is effective and suggests that a "whole-systems approach" (i.e., explicitly addressing patient, professional, and organizational factors) showed the most consistent improvement in clinical outcomes (2017 Yan Hui).

Telehealth

Positive evidence that telehealth interventions are effective in improving health outcomes and patient experience is limited as there are mostly descriptive studies of telehealth/ telemedicine in the literature. 2003 Jennett did a review of the socioeconomic impact of telehealth and concluded that while there are potential benefits (e.g., access, support, reduced social isolation), there is limited high-quality research.

Telehealth interventions seem promising to deliver convenient and individually tailored interventions to promote health-related behavior changes and virtual care (e.g., home monitoring, disease management). One of the limitations of telehealth is having access to good IT support, however, technology advancements will likely decrease technical problems over time. The data feedback loop from a physician or nurse is a critical component for telehealth interventions to have an impact on health outcomes.

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- Telehealth (also called "telemental health care" or "telespecialty care" like teledermatology) is described as communication networks or a platform to deliver health care services/provide virtual care services, health information/education or social support (e.g., videoconferencing, remote patient monitoring through smartphones, wearable devices, computers, biosensor devices).

- One systematic review (2018 Banbury) looked at the effectiveness of telehealth behavior change interventions delivering home-based **online support groups** using videoconferencing ("online groups"). Although research on these types of interventions is limited (mostly pilot, small samples, and non-randomized studies) they found acceptability of group videoconferencing was high in different age and content groups. Hosting the videoconferencing in homes was not a concern in these studies. Effectiveness of home-based support groups varied, but improvements trended for people with mental health problems. The groups were found to be feasible even for people with limited digital literacy.

- A systematic review (2017 Vegesna) reported mostly positive health outcomes from **self-management** (ie., taking BP or tracking weight) provided via telehealth by helping with symptom management and reducing patient visits/hospitalizations.

- Systematic reviews looked at the role of telehealth in **cancer care coordination** (specifically home-based telehealth to deliver automated and interactive messages) and a care coordinator, which was identified as the second most common care coordination intervention (2017 Gorin).

- Another review found moderate quality studies that showed that using videoconferencing for **physical therapy** had a positive impact on health outcomes and satisfaction (2017 Grona).

- A 2017 review by Kruse et al concluded that telemedicine in **managing chronic heart disease** is moderately effective in health outcomes and marginally effective in customer satisfaction.

- **Telemental health care** (2017 Langarizadeh) has multiple capabilities and technologies (ie., videoconference, phone, web-based interventions, social media, group discussions, simulations, internet games) that enables different types of evaluations, information exchange, support, and consulting services. It appears to be the most beneficial for people living in isolated communities, as they found improved patient satisfaction and reduced cost of care. However, key challenges include limited provider and patient technical skills, insurance coverage for technological services, system investments to establish and upgrade technologies, the potential for subscription costs (e.g., internet, data), and the need for regular evaluation of the quality and efficacy of the technologies

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that is not always available. 2016 Coughtrey's findings suggest that telemental health care delivered by phone is promising in reducing symptoms of depression and anxiety.

Social media

Social media was not a commonly referenced technology in the systematic review literature. Social media is described as a platform for communication, and providing and learning information (e.g., Facebook, listservs, YouTube, Twitter, digital chat rooms). In 2017 Langarizadeh, it was noted that social support networks were available as group discussions, bulletins, blogs, and chat rooms based on disease phase, type of relationships, and type of therapy provided.

Additional considerations

- As technological interventions are considered, take into account the target population's level of health and digital literacy and which types of health information technology could be effective. "This will ensure that all users receive the full health benefits from these technological advances, in a manner that protects health information privacy, and that users engage with organizations and providers they trust" (Mackert 2016).

- The medical and social science literature could be limiting and it might help to look at more technology-oriented databases.

Supporting documentation

Banbury A, Nancarrow S, Dart J, Gray L, Parkinson L. Telehealth Interventions Delivering Home-based Support Group Videoconferencing: Systematic Review. J Med Internet Res. 2018 Feb 2;20(2):e25. doi: 10.2196/jmir.8090. Review.

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> "Patients with low health literacy were less likely to use HIT tools or perceive them as easy or useful, but they perceived information on HIT as private. Given the fast-paced evolution of technology, there is a pressing need to further the understanding of how health literacy is related to HIT app adoption and usage. This will ensure that all users receive the full health benefits from these technological advances, in a manner that protects health information privacy, and that users engage with organizations and providers they trust.

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