Mobile Health Technology and the Use of Health-Related Mobile Applications

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Medical mobile applications (apps) are prevalent in society. Healthcare providers use them to obtain clinical information more efficiently, and healthcare consumers use them to gain greater personal control over their health management. With the increasing number of health-related mobile apps available, people in the oncology community now have many relevant apps at their fingertips. These apps are targeted to the oncology healthcare provider as well as the patient. This article will review a few popular apps and discuss the potential benefits of accessing information using apps and the possible risks associated with them.

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Since the mid-2000s, technological advances have transformed healthcare. Innovations have provided important tools for healthcare providers and have empowered patients with access to medical information unavailable to them in the past. Technology, available in the form of computers and cell phones, has greatly affected the way in which people communicate. According to Pew Research Center’s (2014) examination related to mobile technology, 90% of American adults have cell phones and 58% of American adults have smartphones as of January 2014. Smartphones have similar capabilities to a computer, with cameras, instant messaging, Internet access, GPS, and calculators. Mobile applications (apps) are software programs that run on smartphones, tablets, or other mobile communication devices. They are typically available through app distribution platforms, which are operated by the owner of the operating system (e.g., Google Play for Android, Apple App Store, Windows Phone Store). Smartphones have provided opportunities for healthcare providers who are busy in a clinic or hospital setting to instantly access health-related mobile apps that assist them with patient care and work-related responsibilities. These mobile apps include clinical decision-support tools, drug dosing, medication interactions, and International Classification of Diseases coding information.

Various mobile health apps are also available to healthcare consumers. An independent study by the IMS Institute for Healthcare Informatics (2015) examined consumer healthcare apps, which included an objective assessment of their type, role, and functionality. The study revealed that the most common category of consumer-based, health-related mobile apps is for prevention and healthy lifestyles. The prevention and healthy lifestyles category includes diet and exercise, addiction quitting, stress, relaxation, and sleep. This was followed by the second most popular mobile app category of self-diagnosis, which includes symptom checkers. Examples of health-related mobile apps used by consumers include medication reminders, pedometers, daily calorie counters, blood glucose logs, and access to blood test results through a laboratory service.

Mobile Applications for Clinicians

With the large amount of information that needs to be processed, interpreted, and developed into a patient plan in a brief period of time, not surprisingly, technology companies have found a target audience in healthcare providers. Mobile apps, such as Epocrates (www.epocrates.com) and Lexicomp® (www.lexi.com), can be accessed from a smartphone within minutes of a patient encounter. These apps allow for the review of drug dosing, side effects, and drug interactions, which are useful for medication reconciliation and prescribing purposes. Lexicomp provides content specific to nursing. Both apps include clinical content, dosing by patient population, IV administration recommendations, physical assessment, patient monitoring guidelines, and adult and pediatric patient education.

The National Comprehensive Cancer Network has a mobile app available for healthcare providers working in the oncology setting (www.nccn.org/apps). This app provides the latest guidelines for the treatment of cancer by site, supportive care guidelines, and patient educational resources. The app serves as a resource for detection, prevention, and risk-reduction guidelines. Oncology nurses will find the supportive care guidelines extremely useful for managing cancer- and treatment-related...
effects such as pain, fatigue, nausea, and neutropenia.

Calculate by QxMD is a clinical calculator and decision-support tool that includes general calculators such as ideal body weight and body surface area (www.qxmd.com). This mobile app also includes calculators by topic (e.g., cardiology, hematology, mental health, gastroenterology, oncology). The oncology calculator has carboplatin area under the curve dosing, acute graft-versus-host disease (GVHD) grading, prognostic calculators, Multinational Association of Supportive Care in Cancer febrile neutropenia risk-screening guidelines, and more.

Transplant Guidelines, a mobile app available through the National Marrow Donor Program (2014), is useful to nurses working with patients undergoing allogeneic and autologous stem cell transplantations. Nurses can access post-transplantation care screening and preventive practices such as screening for GVHD and verifying potential signs and symptoms of chronic GVHD by area of the body. A review of vaccination schedules for all recipients of hematopoietic stem cell transplantations also exists.

The National Cancer Institute Common Terminology Criteria for Adverse Events (CTCAE), version 4.0, mobile app is available by the Children’s Hospital of Philadelphia (2010). This app, developed by the Center for Biomedical Informatics, is very useful for nurses managing patients on clinical trials. It uses a standardized system to grade the severity of adverse events (e.g., fatigue, nausea, pain) that occur with drug treatment or medical devices. The CTCAE grading is defined as mild (grade 1), moderate (grade 2), severe (grade 3), life threatening (grade 4), and death related to adverse events (grade 5). This grading information is used for monitoring and documenting patients in clinical trials. Having easy access to the grading system via a smartphone during a busy clinic day can be extremely useful for accurate documentation.

Mobile Applications for Healthcare Consumers

According to the IMS Institute for Healthcare Informatics (2013) study, consumer-related mobile health apps focus on overall wellness, diagnosis, finding a healthcare provider, prescription filling, and compliance. Examples of consumer mobile apps include overall wellness-related apps and self-diagnosis apps.

Overall Wellness-Related Applications

Calorie Counter and Diet Tracker by MyFitnessPal (www.myfitnesspal.com) includes a very large database of foods, a bar code scanner to assess calorie counts while in the grocery store, the ability to track nutrients and customize goals based on diet profile (e.g., age, gender, activity level), and progress charts.

RxmindMe by Walgreen Co. (2014) is a reminder app for medications, vitamins, and supplements. The app user can enter the dosage and schedule of a medication, set up reminders, and keep track of what he or she has taken.

Self-Diagnosis Applications

The Melanoma Visual Risk Calculator by Holmen (2011) is an app that lets the user evaluate a pigmented skin lesion using a visual analog scale for each of the ABCDE criteria. The app provides an approximation of the risk of the lesion being a malignant melanoma.

Isabel Symptom Checker by Isabel Healthcare (2013) is an online tool available as a mobile app that allows patients to input symptoms, categorized by age, gender, and travel history, using plain language. The tool searches databases and provides a list of diagnoses that could be causing symptoms. An Isabel™ app that uses medical terminology is also available to healthcare providers at a cost.

Regulations

The U.S. Food and Drug Administration (FDA) plans to regulate certain health-related mobile apps. On September 25, 2013, the FDA issued the Mobile Medical Applications Guidance for Industry and Food and Drug Administration Staff, which describes the agency’s oversight of mobile medical apps that present a greater risk to patients and are defined as devices (FDA, 2014). A device is an app that is intended to be used as an accessory to a regulated medical device or transforms a mobile platform into a regulated medical device. An example of this would include mobile apps that have a sensor or electrode attached to the mobile platform and measures physiologic parameters such as electrical activity of the brain during sleep, limb movement, or electrocardiography (FDA, 2014). For mobile apps that meet the regulatory definition of device, but pose minimal risk to patients and consumers, the FDA (2014) will exercise enforcement discretions and will not require manufacturers to register or list their apps with the FDA.

Conclusion

Health-related mobile apps and related technology will continue to grow and become more sophisticated. Concerns with these apps include misdiagnosis and the lack of follow-up with a healthcare provider. Consumers will not know whether the app has scientifically valid information or if it is periodically updated with the latest evidence-based information. In addition, these health-related mobile apps are not bound by privacy laws, which may lead to advertisers or insurance companies obtaining sensitive information and developing profiles of app users (Privacy Rights Clearinghouse, 2014). The FDA needs to closely monitor this issue and regulate the high-risk products. Healthcare providers should consider having a discussion with their patients about their health-related mobile app usage and discuss possible concerns, such as misdiagnosis, lack of scientific evidence, or privacy issues, and remind patients of the importance of calling healthcare providers with questions and concerns.

References


Supportive Care (Continued from page 621)


Do You Have an Interesting Topic to Share?

Tech Savvy discusses the ways in which technology affects nurses, patients, the healthcare team, and the oncology setting. Length should be no more than 1,000–1,500 words, exclusive of tables, figures, insets, and references. If interested, contact Associate Editor Susan Doyle-Linard, DNP, AOCN®, DCC, at smd9@columbia.edu.

Correction

In Vol. 18, No. 1, of the *Clinical Journal of Oncology Nursing,* the second sentence under Malglycemia on page 41 should have stated: The term “malglycemia” is used to describe perturbations in glycemic levels, including hyperglycemia, hypoglycemia, and/or increased glycemic variability, among patients with or without diabetes (Hammer et al., 2009).