

TECHNOLOGY

# IS USING MOBILE HEALTH ALONE SUFFICIENT TO ENHANCE PATIENT ACTIVATION AND MEDICATION ADHERENCE?

Adesuwa Olomu, MD, MS; Karen Kelly-Blake, Ph.D.; William Hart-Davidson, Ph.D.; Margaret Holmes-Rovner, Ph.D.

*Dr. Olomu (Ade.Olomu@hc.msu.edu) is a professor and vice chair for research at the Department of Medicine, Michigan State University. Dr. Kelly-Blake (Karen.Kelly-Blake@hc.msu.edu) is an assistant professor in the Center for Ethics and Humanities in the Life Sciences and Department of Medicine, Michigan State University. Dr. Hart-Davidson (hartdav2@msu.edu) is an associate professor and associate dean of graduate education in the College of Arts and Letters, Michigan State University. Dr. Holmes-Rovner (mholmes@msu.edu) is a professor emerita for the Center of Ethics and Humanities in the Life Sciences, Michigan State University.*

Mobile health interventions (apps, notifications, and/or text messaging delivered via mobile phones) hold promise to improve health care delivery. These mHealth interventions are attractive because: 1) they are relatively inexpensive; 2) 95% of Americans own mobile phones and 77% own Smartphones, and 3) there are opportunities for automation in the way messages are sent and monitored which could further lower the costs associated with providing care. But, there is a problem. Implementation studies are beginning to show that mHealth interventions may not be enough, on their own, to improve patient health outcomes. Our own results that are part of this growing literature lead us to ask why mHealth technology may not be as transformative as anticipated, especially in managing chronic disease.

Studies that include clinical outcomes, as well as knowledge and attitudes are particularly revealing. The MediSAFE-BP trial by Morawski et. al. (2018) found no change in systolic blood pressure levels among patients with poorly controlled blood pressure (N=411) who were randomly assigned to use a mobile app as part of a medication adherence intervention as compared to those who did not use the application. Use of the app did correlate with a small increase in self-reported medication adherence, but this did not translate to a significant difference in blood pressure control.<sup>1</sup> A recent AHRQ review to evaluate efficacy, usability, and features of commercially available mobile apps for diabetic self-management found that of the 11 apps studied, only 5 were associated with clinically significant improvements in HbA1c. None of the studies showed patient improvements in quality of life, blood pressure, weight, or body mass index. Moreover, none of the included studies was considered high quality.<sup>2</sup>

In our own recent pilot study, aimed at improving cardiovascular (CVD) care for diabetic patients, we found a similar result: a text-messaging intervention alone did not produce improved patient activation, better self-management and better medication adherence in diabetic patients. Our text messaging intervention included: 1) teaching patients to send and receive educational text messages; 2) sending daily messages appropriate to their diagnosis and medications for 14 weeks, along with appointment reminders; and 3) monitoring patient responses to prompts and contacts with their providers. Our intervention comparison arm paired the text-messaging service with a patient-provider intervention, the Office-Guidelines Applied to Practice (Office-GAP) Program. Embedding the text-messaging intervention in the patient-provider activation intervention proved more successful than the texting service alone.

We found that from baseline to four months follow up, patient activation scores as measured by the patient activation measure (PAM) increased by 9.08 on average for combined group (p-value 0.04), while in the texting only group, the PAM score decreased by 5.89 on average (P-value=0.52). In addition, we found that combining texting with Office-GAP significantly improved adherence to refills and medications over time compared to the text-messaging service alone (P-value=0.05). Results described at the SGIM Annual Meeting 2018, April 12 & 13 in Denver, CO, showed that the approach in the intervention arm positions the mHealth intervention in a way that is subtle but important.<sup>3</sup> It does not replace interactions with providers nor does it serve as a supplement to patients' knowledge or motivation. Instead, it is a simple reminder of the care plan agreements that were arrived at

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in interactions between patients and providers. It is, in a word: *feedback*. In the text-message service alone arm, the mHealth intervention itself was expected to produce change in patient knowledge and behavior. We propose that the feedback function may provide an important clue to a reproducible mechanism for effective and efficient use of mHealth interventions.

### Connecting Three Critical Steps in Chronic Care: Coordination, Shared Decisions, and Self-Management in a Feedback Loop

The key steps to the Office GAP intervention apply guidelines to care by provider training, coordination with patients in a moment of real time shared decision-making (SDM), then reinforcement via mHealth and self-management. This creates a positive feedback loop that reinforces evidence-based care.<sup>4</sup>

### The Office-GAP intervention: Getting Providers and Patients on the Same Page

Unlike the stand-alone mHealth interventions, Office-GAP trains patients and providers in shared decision making. The Office-GAP intervention described here included: 1) a patient activation group visit; 2) provider training; and 3) a decision support checklist used in real time in the office in two provider visits. The checklist is a one-page checklist that

outlines all evidence-based medications for secondary prevention of CVD in patients with diabetes. In our previous study, Office-GAP was shown to improve blood pressure control.<sup>5</sup> The combination of Office-GAP + mHealth implements mHealth in the mode of a positive feedback loop. Our goal is to use mHealth to close the loop, providing active reinforcement of the care plan. This is a more narrow and appropriate use of the technology.

**Conclusion:** Text-messaging alone is insufficient. Our study suggests that combining the Office-GAP and mHealth was more effective than mHealth alone, as measured by improved patient activation and medication use, and possibly health outcomes. We appreciate the attraction of using mobile health applications alone because they promise cost savings, efficiency, and maybe even greater accessibility. However, none of those benefits matter if they do not change health outcomes. Our results suggest that the promise of mHealth interventions may lie in using it as a feedback mechanism to support patient activation and shared decision-making in clinical practice. Expecting mHealth applications to function as a technology to change patient behavior situates mHealth in earlier behaviorist approaches. We suggest that the feedback function can be a critical use of the new technology to sustain the gains that

have been shown in shared decision making interventions over longer intervals.

### References

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