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Q/Do electronic reminder systems help patients with T2DM to lose weight?

EVIDENCE-BASED ANSWER

A/ **PROBABLY NOT**—but they may augment self-management. Four-component telehealth systems—including electronic reminders, measuring devices, patient-driven data upload, and remote data analysis—likely don't result in significant weight reductions in adults with type 2 diabetes (T2DM). However, their use may be associated with a decrease in hemoglobin A1C of about 0.4% (strength of recommendation [SOR]: **B**, meta-analysis of randomized controlled trials [RCTs] and conflicting smaller subsequent RCTs).

Telehealth is considered a reasonable option for augmenting diabetes self-management in patients who are facile with the technology (SOR: **C,** expert opinion).

Evidence summary

A meta-analysis of 6 RCTs studied the effect of smartphone self-care applications on A1C, weight, blood pressure, and lipids in adult patients with T2DM. All the interventions comprised 4 components: electronic self-management prompts and reminders, personal measuring devices, patient-driven data upload, and remote analysis of the data with feedback. The review excluded studies that used phone calls or lasted fewer than 3 months.

Some improvement in A1C found, but no effect on weight

Telehealth interventions improved A1C more than usual care (6 trials, 884 patients; mean difference = –0.40%; 95% CI, –0.69% to –0.11%).[1] A subset of 4 studies with 560 patients evaluated changes in weight. Patients had a mean age of 61 years and average weight of 84 kg (in 3 of 4 studies reporting baseline weight). Aggregate weight loss was insignificant after 3 to 12 months (mean difference = –0.84 kg; 95% CI, –2.04 kg to 0.36 kg, P = .17). Investigators reported no harms. Limitations of the analysis included high heterogeneity in the main outcome of A1C (I^2 = 70%) but low heterogeneity within the 4 studies assessing weight (I^2 = 30%).

Other, small studies found no change in A1C

Two subsequent small RCTs came to different conclusions than the meta-analysis. One compared the impact of individualized physical activity–based text messages in response to pedometer readings with pedometer use alone.[2] It included 126 adult patients (mean age, 50.5 years) with T2DM who had an A1C > 7% and access to an Internet-connected computer. Researchers excluded patients who were unable to perform moderate physical activity or who had cognitive deficits.

At enrollment, researchers supplied all patients with a pedometer and an appointment with a counselor to set goals for physical activity. They sent 2 text messages daily to the intervention group (and none to the control group) based on uploaded pedometer data. One message detailed physical activity progress and the second encouraged increased

physical activity. The primary outcome was mean step counts per month; secondary outcomes included A1C and weight measured at 6 months.

The groups showed no significant difference in A1C (mean difference = 0.07%; 95% CI, –0.47% to 0.34%, P = .75) or weight loss (mean difference = 3.1 lb; 95% CI, –24.5 lb to 18.3 lb, P = .77). Many patients (43%) reported difficulty uploading step counts, receiving texts, and responding to texts. The dropout rate was 24%.

A second RCT with 150 patients, using a less elaborate protocol, assessed the effectiveness of tailored text-message reminders compared with nontailored text messages to improve A1C and body mass index (BMI).[3] Patients were adult Iranians (mean age, 52.5 years) with T2DM who owned a cell phone and could receive and read text messages.

Patients filled out a diabetic self-care assessment to identify barriers to improving care and were randomized into 3 groups. The first group received tailored text messages (75% addressing the patient's top 2 barriers to self-care and 25% general messages). The second group received nontailored text messages of encouragement. The control group received no text messages.

After 3 months, BMI was reduced in both messaging groups but not the control group (tailored text = –0.6 kg/m², nontailored text = –0.5 kg/m², controls = 0.7 kg/m²; P < .05). A1C levels didn't change significantly. One limitation of the study was that 30% to 35% of the patients in the intervention group had a university-level education, compared with 12% in the control group.

Recommendations

The Department of Veterans Affairs issued guidelines in 2017 regarding management of patients with T2DM in primary care.[4] The guidelines state that all patients should receive individualized self-management education using "modalities tailored to their preferences" (strong recommendation). They further recommend "offering one or more bidirectional telehealth interventions" in coordination with patients' health care providers (weak recommendation).

The 2017 diabetes self-management recommendations endorsed by the American Diabetes Association state that "strong evidence" shows that incorporating text messaging into diabetes care improves outcomes, enhances feedback loops, and empowers patients.[5]

Editor's takeaway

Telehealth offers mechanisms for patients and physicians to enhance communication about health behaviors and health status. But does it alter outcomes? The cited literature suggests that benefits aren't a forgone conclusion and that acceptability, ease of use, cost, and individualization are critical issues in telehealth design.   **JFP**

> **Telehealth interventions may be associated with a decrease in hemoglobin A1C.**

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