

# Telehealth Diabetes Self-Management Education and Support

## *Opportunities, Barriers, and Strategies for Communication: A Literature Review*



## Background

In spring 2021, Wilder Research partnered with the Minnesota Department of Health (MDH) to research barriers to participation and effective communication strategies for telehealth Diabetes Self-Management Education and Support (DSMES) programs among State Employee Group Insurance Program (SEGIP) beneficiaries who have a diabetes diagnosis.

MDH has observed through administrative data that rural employees are less likely to enroll in in-person DSMES programs compared to their urban counterparts. However, DSMES is now available to SEGIP beneficiaries online and at no cost, with the intention of reducing barriers to participation. MDH seeks to understand barriers to participation in telehealth DSMES programs, and identify effective communication strategies for increasing enrollment and participation in telehealth DSMES programs.

To this end, Wilder Research hosted a series of focus groups with rural and urban SEGIP beneficiaries and conducted a targeted review of the relevant research literature. The findings from this research will be used to inform future communication strategies to promote the utilization of DSMES among state employees in urban and rural areas. They will also inform MDH of ways to decrease barriers to participation in online DSMES programs for both rural and urban SEGIP beneficiaries.

Wilder Research searched the literature based on a set of key research questions:

- How effective or not effective are telehealth DSMES programs?
- What are barriers to participation in telehealth and strategies for addressing those barriers? Are barriers to telehealth different for rural and urban populations?
- What moves people to readiness to participate in a health program like DSMES (i.e., the Transtheoretical Model Stages of Change)?
- What is appropriate messaging at the different Stages of Change to move along the continuum? What are effective messaging strategies to motivate people to enroll in health programs like DSMES? What are effective strategies for the rural population?
- When are people most receptive to the idea of enrolling in a program (e.g., hospitalization, diagnosis, major life changes/events)?

This review focuses on existing relevant systematic reviews and meta-analyses. Findings from the targeted literature review are summarized here; findings from the focus groups are reported separately.

## Summary

### Effectiveness of telehealth DSMES

Telehealth is a promising approach for delivering diabetes self-management education and support that reduces some common barriers to in-person health services. Rural communities, in particular, may have limited access to in-person DSMES due to fewer providers, further distances to those providers, and transportation barriers (Lepard et al., 2015). Telehealth may help reduce or eliminate these barriers to DSMES among rural communities (Lepard et al., 2015).

A number of studies have provided evidence that telehealth DSMES is effective at promoting healthy behavioral change and improving clinical outcomes. A systematic review of randomized controlled trials (RCTs) evaluating telehealth DSMES programs reported statistically significant improvements in:

- Health behaviors (e.g., diet, physical activity and exercise, medication use, and reduced smoking)
- Clinical outcome measures (e.g., glycated hemoglobin (HbA1c), fasting blood glucose, cholesterol, and triglycerides)
- Psychological outcomes (e.g., depression, diabetes distress, psychosocial well-being, self-efficacy, stress and communication; van Vugt et al., 2013).

A more recent systematic review of review articles and meta-analyses also found significant reductions in HbA1c among participants in technology-enabled DSMES programs (Greenwood et al., 2017). The authors reported four key elements of telehealth DSMES programs that were associated with improved HbA1c:

1. Two-way communication between participants and health providers
2. Tracking and analysis of Patient-Generated Health Data (PGHD; e.g., blood glucose, lifestyle choices, symptoms)
3. Participant-tailored education based on reported PGHD
4. Individualized, tailored feedback (whether through automated mechanisms, or health care providers)

Notably, one study compared effectiveness of telehealth and in-person DSMES over time and found that they were equally effective (Ciemens et al., 2011). Participant receipt of preventative services (e.g., retinal, peripheral neuropathy, and renal screens) and clinical outcomes (e.g., blood pressure, HbA1c, and LDL-cholesterol) increased at similar rates between participants in telehealth and in-person DSMES groups across time (Ciemens et al., 2011). Telehealth and in-person DSMES participants also had similar outcomes related to diabetes knowledge, satisfaction, communication, self-efficacy, and self-reported symptom status.

Additionally, telehealth delivery may improve participant retention in DSMES interventions. A systematic review of DSMES programs found that, on average, interventions that took place in participants' homes (whether via phone or in-person with a provider) had a higher retention rate (80%) compared with interventions that required participants to travel to a clinical office (72%; Lepard et al., 2015).

## Barriers and facilitators to participation in telehealth DSMES

While there is evidence that telehealth DSMES is effective and eliminates some existing barriers to in-person health services, the online mode of delivery may create new barriers to participation. These potential barriers are discussed in detail below.

### *Technology accessibility can support or hinder participation in telehealth DSMES.*

There are a number of technology-related factors—including infrastructure, app-specific features, and lack of adequate support—that may serve as barriers to DSMES participation.

**Technology infrastructure.** Individuals or communities with limited access to internet or poor connectivity may be unable to participate in telehealth DSMES programs (Jain et al., 2020; Jeffrey et al., 2019; Keeling et al., 2019; O'Connor et al., 2016; Signal et al., 2020). One study of users

and non-users of telehealth DSMES noted that internet connectivity was of particular concern among rural DSMES participants, who were more likely to be out of range of cell service (Jeffrey et al., 2019). Among these participants, DSMES apps that incorporate “offline” features (i.e., that are functional with or without internet connection) may be beneficial (Jeffrey et al., 2019).

**App-specific features.** Several studies found that if the DSMES app itself was difficult to navigate, had poor connectivity (i.e., to Bluetooth devices), or frequently crashed, participants were also less likely to participate in the DSMES program (Jain et al., 2020; Jeffrey et al., 2019; Signal et al., 2020). Conversely, accessible DSMES app design (e.g., easy navigation, concise information, lack of medical jargon) facilitated and encouraged participation (Jain et al., 2020; Jeffrey et al., 2019; Peng et al., 2016). Additionally, some patients have reported that they would be less likely to participate in a telehealth intervention like DSMES if there were a cost associated with using the app (Jain et al., 2020; Jeffrey et al., 2019).

**Lack of adequate support.** Participants may also face difficulties in participating in telehealth DSMES if not provided with adequate supports related to poor technology literacy or general literacy, unmet language needs, physical disabilities, and unmet learning needs related to learner differences (Jain et al., 2020; Jeffrey et al., 2019; Keeling et al., 2019; O’Connor et al., 2016; Peng et al., 2016).

### ***Education and referral is necessary to address information gaps and build trust and reputability.***

**Information gap.** Several studies have found that some individuals with a diabetes diagnosis reported not using telehealth DSMES simply because they were unaware of the option (Jeffrey et al., 2019; O’Connor et al., 2016; Peng et al., 2016). For these individuals, effective advertising and education campaigns may reduce the information gap and encourage participation in telehealth DSMES services (O’Connor et al., 2016).

**Trust.** A systematic review of studies on patient and health care provider attitudes towards telehealth DSMES reported that some individuals expressed concern about the trustworthiness of the intervention, in terms of data privacy and security, and the validity of the information provided (Jain et al., 2020). One longitudinal cohort study of telehealth DSMES users reported mixed views on the reliability of the information provided (Yu et al., 2014). While information perceived to be from an authoritative source like a health care provider drew users to the app, peer information-sharing was considered unreliable when the content was not monitored and fact-checked by a health care professional. These findings are based on data collected from majority White, English-speaking study participants (81% White and 19% Asian; Yu et al., 2014). Findings may differ for other demographic groups (e.g., immigrant populations).

There is also some evidence that participants' referral sources about telehealth DSMES may either contribute to or detract from participation. Some non-users of telehealth DSMES cited lack of health care provider recommendation as a reason for their lack of participation (Jeffrey et al., 2019; Peng et al., 2016). However, when health care providers or other trusted sources (e.g., family, friends, or peers) recommended the telehealth DSMES program, it helped to build trust, buy-in, and promote participation (Jeffrey et al., 2019; O'Connor et al., 2016; Peng et al., 2016). While existing research is limited, the available literature suggests that providers generally hold positive attitudes towards telehealth DSMES, together with some concerns about the integration of such programs into existing health care systems (Jain et al., 2020). It is possible that there is a knowledge gap about telehealth DSMES availability among health care providers.

### ***Participants' perceptions of the program's value and lifestyle fit influence participation in telehealth DSMES.***

**Added value.** Patient perceptions that telehealth DSMES does not add value (i.e., to their management of their disease, their health) was a frequently cited barrier to participation in the program (Jain et al., 2020; Jeffrey et al., 2019; Keeling et al., 2019; O'Connor et al., 2016; Peng et al., 2016). Patients who already had diabetes self-care knowledge were less likely to find telehealth DSMES useful, or preferred their existing systems for managing their health (e.g., paper based systems or social support from family, friends, and health professionals; Jain et al., 2020; O'Connor et al., 2016). Some individuals expressed a strong preference for, or reliance upon, the social support that in-person health services offer (Jain et al., 2020; Keeling et al., 2019).

Alternatively, other participants valued having convenient access to information customized to their health and specific circumstances (Jain et al., 2020; O'Connor et al., 2016). Telehealth DSMES gave these participants a greater sense of control and agency over their own health (Jain et al., 2020; O'Connor et al., 2016). In particular, some participants placed high value on visual representations of trends in their personal health data over time (Jeffrey et al., 2019).

**Lifestyle fit.** Patients who perceived the app to be overly disruptive or burdensome, or to not fit into their pre-existing lifestyle, were less likely to participate in telehealth DSMES (Jain et al., 2020; Keeling et al., 2019; O'Connor et al., 2016; Peng et al., 2016). In contrast, other individuals valued the convenience of having instant access to information, whenever and wherever they needed it, via the mobile virtual platform (Jain et al., 2020; Jeffrey et al., 2019; O'Connor et al., 2016; Reidy et al., 2020). These participants felt that telehealth DSMES could easily fit into their personal life and schedule (O'Connor et al., 2016).

# Effective communication strategies for telehealth DSMES recruitment and participation

A systematic review on engagement and recruitment to digital health interventions found that personalized promotion and recruitment strategies were more effective than generic messaging (O'Connor et al., 2016). One study examined effective health messaging strategies through the lens of the Transtheoretical Model's Stages of Change and Self Determination Theory (Pope et al., 2018).

Based on these findings, in order to encourage recruitment and participation in telehealth DSMES, communication strategies should **tailor messaging based on participants' Stages of Change** and **frame messaging to promote self-determined motivation** (Pope et al., 2018). Findings and recommendations from this study are reported below.

## *The Transtheoretical Model's Stages of Change*

Individuals may be more likely to progress towards and adopt a healthy behavior if the messaging they receive is tailored to the "stage of change" they currently are in (Pope et al., 2018). The Transtheoretical Model outlines three primary stages of change (Pope et al., 2018; p. 4):

1. **The detection phase:** in which "people gather information in order to detect if a health problem exists and determine if it is personally relevant,"
2. **The decision phase:** in which "people who recognize that a problem exists and that it is important, seek out information to decide what action they should take to alleviate the problem," and
3. **The implementation phase:** in which "a person has decided to act and searches for information on how, when, and where to implement a behavior and/or how to sustain it."

Pope and colleagues (2018) recommend that health communications strategies be tailored to these stages of change (in addition to the final, fourth *maintenance phase*, in which a person sustains their adopted behavior over time) in order to increase the likelihood that the communication strategy, and information conveyed, leads to the adoption and maintenance of the desired behavior change.

## *The importance of self-determined motivation*

A person's likelihood to adopt and sustain healthy behavior change is also impacted by whether their motivation is self-determined or not (Pope et al., 2018). Self-determined motivation stems from a person's enjoyment of the activity, self-endorsement, and integration with their personal values. In contrast, non-self-determined motivation stems from feelings of external pressure, guilt, shame, or ego-enhancement. Similarly, a person's goals can be intrinsic, "desires that are

congruent with actualizing personal growth and satisfying basic psychological needs (the goals equivalent to self-determined motives),” or extrinsic “(e.g., attractiveness, fame), which are contingent on reactions from others and serve as a means to an end (the goals equivalent to non-self-determined motives)” (Pope et al., 2018; p. 4).

People who are motivated by self-determined reasons and intrinsic goals are more likely to sustain a healthy behavior change, whereas people who are motivated by non-self-determined reasons and extrinsic goals may adopt a healthy behavior, but are more likely to fail to sustain it (Pope et al., 2018). To promote the adoption and sustainment of healthy behavior change, health communication strategies should work to foster self-determined motivation and intrinsic goal-setting (Pope et al., 2018).

### ***Recommendations for health communication strategies***

Pope and colleagues (2018) outline recommendations for health communication strategies, tailored to each of the four Stages of Change (detection, decision, implementation, and maintenance) and framed to promote self-determined motivation and intrinsic goal setting. These recommendations are summarized below.

#### **Detection phase**

In the detection phase, individuals may be unaware of the health problem or not understand why the problem is personally relevant to them.

Pope and colleagues (2018) recommend:

- Identifying negative consequences associated with *not* adopting the health behavior (e.g., health problems, impacts on important relationships, loss of ability to perform enjoyed activities or hobbies)
- Present small, realistic opportunities or resources to solve the problem
- Provide self-determined rationale (e.g., personal improvement and health)
- Emphasize intrinsic goals (e.g., fitness and well-being) rather than extrinsic goals (e.g., appearance, peer comparisons, external judgement and validation)

#### **Decision phase**

Messaging at the decision phase should support individuals to develop their own goals and determine the feasibility of achieving those goals (Pope et al., 2018).



Messaging should incorporate (Pope et al., 2018):

- Health guidelines for the intended behavior change (e.g., [Centers for Disease Control and Prevention diabetes management guidelines](#))
- Explanation(s) of how the behavioral change will help address health concerns
- Useful tools to create tangible and personally meaningful goals
- Resources to decide which activity to engage in (e.g., a link to available DSMES online programs)
- Achievable tips that help foster individuals' sense of competence (e.g., walking during lunch breaks and meetings)

### **Implementation phase**

In the implementation phase, individuals may have set their goals and intentions, but have not yet changed their behavior. This may be due to a lack of confidence that they are capable of making the intended change. Pope and colleagues (2018) recommend that information should promote individuals' sense of competence and ability to change their goals.

Messaging should provide (Pope et al., 2018):

- Instructions on how to create an action plan (i.e., identifying when, where, and how to initiate behavior change)
- Guidance (e.g., a template) on drawing connections between a person's self-determined goals and the plans and activities necessary to achieve them
- Resources informing individuals where, when, and how they can initiate their desired behavioral change

### **Maintenance phase**

Some individuals fail to maintain healthy behavioral change, particularly when they have deeply ingrained habits related to the unhealthy behavior, or when social pressures or temptations present themselves (Pope et al., 2018). However, there is some evidence that individuals who use strategies like coping planning (i.e., identifying personal barriers and strategizing how to overcome adversity) are more successful in sustaining healthy behavioral change.

Messaging should provide (Pope et al., 2018):

- Guidance on developing a coping plan
- Information on the importance of noticing and recording potential obstacles (e.g., situations that tempt them, or barriers like time, money, or anxiety)
- Support identifying viable solutions for each potential barrier



## Challenges

While there is evidence that messaging tailored to a person's Stage of Change is more effective than a generic message, a population's current Stage of Change may be unknown or unknowable (Pope et al., 2018). Unless health professionals are able to identify a person's stage, messaging strategies may not be optimally effective.

## Considerations for timing of health messaging strategies

It is well established in the clinical literature that DSMES is *required* at four key time points in a person's life: at diagnosis, annual exams, when complicating factors arise, and during transitions in care (Greenwood et al., 2017). However, from the patient perspective, there is limited research available on when individuals are personally most receptive to enrolling and participating in programs like telehealth DSMES.

One recent, small study held focus groups with insulin pump users and their health care providers (Reidy et al., 2020). During the focus groups, patients expressed a desire for web-based DSMES support—in particular, “in times of heightened difficulty and situational change (e.g., pregnancy, health complications, new employment arrangement, and experience of “burnout”)” (Reidy et al., 2020, p. 7). This preliminary finding is in alignment with the clinical priorities outlined above. However, further research is needed to investigate when patients are most willing to enroll and participate in telehealth programs like DSMES to ensure that messaging strategies are reaching them at the right time.

## Conclusions

A targeted review of the research literature found that telehealth DSMES contributes to successful diabetes self-management among individuals with a diabetes diagnosis, including improvements in individual health behaviors and both clinical and psychological outcomes (van Vugt et al., 2013). Additionally, the telehealth approach may help overcome existing barriers to in-person health care, particularly among rural populations. However, public health and health care providers should maintain awareness of potential barriers related to the telehealth mode of delivery, and address those barriers whenever possible to increase access to DSMES. Additionally, to encourage enrollment and participation in telehealth DSMES, communication strategies should incorporate a series of varied messages tailored to potential participants' stages of change and framed to encourage self-determined motivation, to the extent possible. More research is needed to identify when individuals with a diabetes diagnosis are most receptive to enrolling in a DSMES program.

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### For more information

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