MSSU KNOWLEDGE SNAPSHOT 3

SELF-MANAGEMENT SUPPORT: TECHNOLOGICAL INTERVENTIONS

INTRODUCTION

Self-management (SM) is frequently defined as "*the tasks that an individual must undertake to live well with one or more chronic conditions. These tasks include having the confidence to deal with medical management, role management and emotional management of their conditions.*"[1] People with chronic conditions cannot be expected to do this alone. They need the support of others, education, coaching, resources, and interventions to develop their knowledge, skills and confidence to manage the impacts of their disease.[2]

Self-management support (SMS) can be defined as the "*process of providing multi-level resources in health care systems (and the community) to facilitate a person's self-management. It includes the social, physical and emotional support provided by health professionals, significant others and/or carers, and other supports to assist a person in managing their chronic condition.*"[3] A person-centered approach is a vital component of SMS.

BACKGROUND

SMS programs are more likely to be successful if they:[2]

- Increase a person's confidence, knowledge, skills and motivation
- Are integrated within primary health care (i.e. as part of care delivery pathways, office visits, programming)
- Address multiple chronic conditions
- Include informal caregivers as their own specific group
- Target underserviced populations
- Utilize a mix of approaches

SMS should be offered in a range of ways, including group based programs – which may be delivered by health care providers, peers, or others, within or outside of the health care system (i.e. community). Examples include peer support groups, group medical visits, and generic SMS programs. Individualized interventions are also important. Examples include home-based programs, peer, or health care provider coaching. Technology is an area of emerging interest in the SM literature,[2] and will be further explored in this briefing.

Self-management research: An overview

Self-management (SM) research is a large field growing at a rapid pace. Table 1 shows the remarkably high number of records currently available in the MEDLINE journal and abstract database. These records cover a broad range of populations, interventions, and outcomes. Given this large volume of research, it is important to ask focused research questions about specific chronic diseases, populations, settings, or other criteria.

Table 1 – Self-management records in MEDLINE

Total records published on self-management as of September 18, 2019	17,760
Records published on self-management from January 2019 to September 18, 2019	2,419
Systematic reviews on self-management as of September 18, 2019	307

SPOTLIGHT

Technological self-management support interventions for people with limited access to the internet

While internet-based SMS programs are becoming increasingly popular, the reality is that significant parts of rural Nova Scotia have limited or no access to high-speed internet.[4] This is an important consideration for health services planning, as internet-based programs may not reach their intended population.

The primary objective of this spotlight is to highlight technological interventions accessible to anyone with a mobile phone or landline.

Mobile apps

What do they look like? How do they work?

Much like the field of SM research, SM apps are prolific and continue to multiply at a rapid pace. Table 2 shows the number of apps available for a selection of chronic conditions, as reported by published studies.

Table 2 – Number of apps developed for specific chronic conditions

Condition	# of Apps
Diabetes	143[5]
	121[6]
Hypertension	186[7]
	151[8]
Multiple Sclerosis	27[9]
Persistent Pain	21[10]
Chronic Kidney Disease	4[11]

*Content*

Common SM app features include:[5–11]

- Recording symptoms

- Monitoring health status (e.g. blood pressure) and visualizing changes over time

- Managing interventions such as self-administered medications, including setting reminders

- Creating and sharing reports

- Recording notes

- Goal-setting

- Connecting with health care providers and/or peers

- Self-care features such as stress management, lifestyle advice and support, and self-reflections (e.g. diary entries)

Design

See Appendix 1 for a table outlining common app design features. Commercially available health apps often do not use or consider the available evidence base in their design, and do not consistently employ established behavior change techniques.[7,12] Furthermore, app developers rarely mention or consider the importance of such evidence or techniques. Some apps use "gamification" or feedback techniques to make using them more appealing and rewarding.[13,14]

Accessibility

Apps are most commonly downloaded via the internet to be used on a smartphone or tablet. Once initially downloaded, they may be fully or partially usable offline. In areas with limited access to internet, an app's dependence on constant or frequent connectivity is an important consideration.
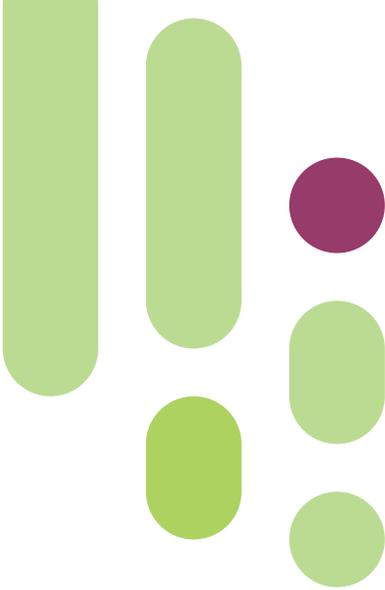
Privacy

Many SM apps lack adequate privacy and security measures.[7] As with any technology or tool that involves storing and/or transmitting personal health information, it is important to investigate an app's privacy measures before recommending or using it.

Are they effective?

Effectiveness of SM apps varies widely, and according to Scott and colleagues,[12] evidence on app effectiveness tends to be inconsistently reported in low-quality studies. Furthermore, there is no universal evaluation framework.[12] This means that despite the high number of SM apps developed, most have not been proven effective.[7,12]

Therefore, it is important to be selective when choosing SM apps. Apps are more effective if they:

- have a clear theoretical basis;[7]

- employ behaviour change and/or gamification techniques, which increase patient motivation;[13,14]

- emphasize increasing self-efficacy;[15] and/or

- have three or more functionalities.[7]

Barriers and facilitators

Table 3. Patient-level barriers and facilitators that affect success of using SM apps[7,15-18]

FACILITATORS
• High level of self-efficacy
• Evidence that a patient is able to change their behaviour
• Strong health literacy
• Active support and feedback from health care providers and/or social networks
• App is age-appropriate, customizable, and compatible with other technology
• Use of gamification if app is designed for youth

BARRIERS
• Low confidence or motivation to self-manage
• Low perceived value of using the app
• Disabilities that make the app unusable
• Lack of confidence using technology
• Already have established SM routines

Table 4. Barriers for primary care providers recommending SM apps[7,19,20]

BARRIERS
• Concerns about changes in workload and/or scope of practice
• Concerns about fitting the app into existing workflow
• Concerns about reduction in face-to-face care delivery
• Perception that apps may only be effective for certain patients (e.g. highly motivated, tech savvy)

Telephone support

What does it look like? How does it work?

Telephone-supported SM is a complement or alternative to face-to-face support and is accessible in areas without internet. Support can take place between patients and their health care providers (e.g. doctors, nurses, or specialists), or between peers (i.e. peer coaching). Conversations or consultations are usually scheduled events over many weeks and months,[21-23] and may be a mix of one-on-one calls and group teleconferences.[22]

Is it effective?

A 2017 meta-review[24] of supports for five conditions (diabetes, heart failure, asthma, chronic obstructive pulmonary disease, and cancer) concluded that telephone-supported SM was equally effective as standard (i.e. face-to-face) care.

Subsequently, a 2018 comprehensive narrative review[25] of telehealth methods found that cellphone conversation support was a primary means of maintaining communication between health-care providers and patients. This support led to improvements in the following categories:

- Self-care skills in older patients with a wide range of chronic conditions

- Self-monitoring behaviour such as weight control and dietary modifications

Some recent studies and/or reviews have focused on the effectiveness of telephone-supported SM on diabetes, multiple sclerosis, and heart failure:

Diabetes

von Storch and colleagues[23] reported on a 12-month lifestyle telemedicine-assisted SM program combining telemedical feedback devices and phone-based patient/coach meetings. Participants in the program showed significantly greater improvements in HbA1c (a measure of blood sugar over a period of time) than the control group. Similarly, a systematic review[26] and a scoping review[27] both found that telehealth interventions including telephone-supported SM led to improved glycemic control.

Multiple sclerosis (MS)

Plow and colleagues[22] found that a combination of group teleconferences and one-on-one calls had a small but statistically significant effect on promoting physical activity and reducing fatigue impact in MS patients.

Heart failure

Hanlon and colleagues' meta-review[24] found a total of nine reviews analyzing telehealth interventions for heart failure. The results of these reviews, which looked at a combination of telehealth interventions including telephone-based support, had varying results. While some included reviews found that telephone-based support was associated with reduced mortality and hospital admissions, this was not consistent across all reviews.

Barriers and facilitators

Table 5. Barriers and facilitators for uptake and effectiveness of telephone-supported SM[25,28,29]

FACILITATORS
• Strong existing relationships between patients and providers, peers, or coaches
• Service is integrated smoothly into existing care, and into patients' everyday life
• Service designed to promote users' self-awareness of symptoms
• May be more cost-effective than traditional care
• More accessible than technology-heavy interventions

BARRIERS
• Lack of cultural receptiveness

Cultural considerations

Telehealth interventions, especially those that use technology other than the telephone, may be less effective in minority or underserved populations. This is supported by a small number of studies set in the United States.[29-31] Although it is difficult to make recommendations for Nova Scotian residents based on these few studies, it may be helpful to consider the following:

- Patients in minority or underserved populations may prefer basic, telephone-based support over technology-heavy interventions

- Telephone-based support should be supplemented by other forms of care[29]

- Caregiver involvement may help patients stay engaged[31]

When possible, telephone support should be given by providers or peers with a similar cultural background or understanding; however, this alone might not be enough to improve effectiveness29

Text messaging

Very few studies focus on text messaging as the sole method of SM support, and what little literature exists is outdated.[32-35] Using text messaging alone "under-utilises the range of interactive capabilities within modern mobile devices" (Coorey et al., 2018, p. 506).[13] If used, text messaging should therefore be paired with another form of SM support as outlined above.

SUMMARY

Technology can be a great way to facilitate SM support, especially in rural and remote areas where getting face-to-face time with health care providers can be difficult. As internet connectivity is still limited in some parts of Nova Scotia, offline mobile apps and telephone support may be good

options for patients in these areas. Evidence has shown that there are some patient-level factors that support uptake and/or efficacy of these supports. Health care providers should be selective when choosing mobile apps to recommend, and bear in mind that technological interventions may need to be bolstered by other supports.

METHODS

LB used targeted search methods in Ovid MEDLINE to locate the references cited. Title/abstract screening was conducted in MEDLINE. LR extracted relevant information and assisted LB with the writing of the snapshot. SM contributed to the snapshot with input from the NSHA Primary Health Care Team. JK assisted with editing and formatting.

LIMITATIONS

This snapshot is not intended to be an exhaustive synthesis of the literature, but a high-level overview of the evidence related to the primary objective.

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APPENDIX 1. Table 2 from Scott et al. (2018), p e[12]

Table 2. Design features enhancing patient use of an app and ability to gain most benefit

Develop different versions of apps for different stages of disease (mild to severe)

Make the app easy to navigate and include a tutorial for using it

Engage the user by having an app that is colourful, consolidated, convenient and relevant to their needs
  Intuitive interaction with appealing user interfaces
  Variety of incentives to keep coming back to use it
  Scripted storytelling or user-generated narrative
  Visual characters and icons that empathise with users or that users can empathise with
  Ideal worlds that can be explored, or real worlds that can be augmented

Educate and prepare users by having up-to-date, personalised information that informs and enlightens

Motivate the user to change behaviour by providing:
  practical tips for better self-management
  achievable goals of care
  reminders, alerts and gamification
  personalised, real-time feedback
  access to expert clinical advice when and as needed
  access to desired peer and social support (chat forums, social networks)

Ensure basic self-management tasks are universal functions, such as disease markers (e.g. blood glucose level in diabetes), medications, nutrition, physical exercise and bodyweight

Enable easy data entry (voice and image recognition, data transfer from other devices, built-in smartphone sensors)

Enable analysis of data and its patterns in discerning interactions between behavioural changes and disease markers

Include predictive analytics based on gathered data

Enable compatibility with different operating systems for smartphones by using packages available for different platforms

Enable data saving, transfer and sharing (from external devices, patient to medical expert, between family members)