

What is Diabetes Self-Management Education and Support?

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ABSTRACT

Diabetes is a non-communicable disease that has become an epidemic in many countries around the world, with a significant increase in the number of cases. Patients are required to have good glycemic control and maintain a normal level of HbA1c. However, some patients are still uneducated and uninformed about their conditions, resulting in ineffective planning and treatment. Diabetes self-management and support (DSMES) is a service that can help patients practice their decision-making and goal-setting skills and improve their quality of life. DSMES can come in various styles, including websites, digital applications, and gamification. Each method has a different approach to patients in terms of the process; however, they share a common theme of patient-centered service.

KEYWORDS:

body mass index, diabetes mellitus, gamification, HbA1c, self-management

INTRODUCTION

Diabetes is a chronic, non-communicable disease which affects the body's ability to convert food into energy. The body's mechanism when sugar enters the bloodstream is to release the insulin hormone to regulate the blood sugar level. In consequence, abnormal blood sugar levels can occur, including hyperglycemia and hypoglycemia as the medical terms for high and low levels of blood sugar, respectively¹. Nowadays, there are a total of 537 million diabetes patients and it is expected to rise to 643 million by 2030². Moreover, the number of patients diagnosed with diabetes is rising rapidly, from 108 million to 422 million in 34 years, especially in low and middle income countries³. Nevertheless, the mortality rate has increased by 3% in the last two decades. In 2019, diabetes and diabetes related diseases are responsible for 1.5 million deaths³⁻⁴.

According to the Centers for Disease Control and Prevention, there are three main types of diabetes, which include type 1, type 2 and gestational diabetes¹. Type 1 diabetes can occur as a result of the autoimmune reaction of the body which causes the body to terminate the making of insulin. It accounts for 5-10% of all diabetes cases. It is commonly found among teens and young adults. Meanwhile, type 2 diabetes is frequently found in adults and approximately 90-95% of all diabetes cases as a result of the inefficient use of insulin by the body¹. While diabetes type 1 and 2 are caused by insulin related complications, gestational diabetes occurs during pregnancy³⁻⁴. Women who have gestational diabetes can face many complications. Furthermore, the risk of their children developing diabetes increases. However, there are other risk factors affecting a patient's chance of getting diabetes; for instance, a patient's family history and ethnicity⁵.

Even though these three types of diabetes have many symptoms, it may not be present in all patients. This includes frequent urination, feeling thirsty, blurry vision, slow healing wounds, and others. With the listed symptoms, patients with diabetes can develop other diabetes related drawbacks, including kidney, cardiovascular, and neuropathy diseases⁵. Nevertheless, gestational diabetes presents its own complications for both the mother and baby. The mother and baby can further develop type 2 diabetes and a low blood sugar level.

As a diabetes patient, early diagnosis and treatment are essential. It can be done by testing blood sugar level, glycated hemoglobin, body screening for signs, creatinine level, and body mass index ratio⁶. However, many treatments rely on the patient's self-management which includes diet and physical activity. With many complications that can happen, patients are also advised against the use of tobacco products and other products that may increase blood pressure³. Patient's self-management is important for the treatment. A service that can help and delay the complications is Diabetes Self-Management and Support (DSMES)⁷. This research will contain information about the general information, types, National Standards, obstacles, and the impacts of diabetes self-management education and support.

GENERAL INFORMATION

DSMES is a process that is essential for diabetes patients to learn the skills and implementations about their behaviors to manage their conditions beyond the hospital. It offers services that can help patients with factors that can interfere with their treatment, such as limitations, family support, financial status, medical history, decision making and nevertheless, the treatment itself. According to the American Diabetes Association, its goal is to increase the availability of diabetes education for patients and improve treatment outcomes^{6,8}. In addition, the COVID-19 pandemic affected the healthcare

system. Therefore, the service provided by DSMES is recommended for hospitals and government agencies to utilize in accordance with the National Standards.

TYPES OF DSMES

1. Diabetes self-management and support (DSMS)

DSMS is the support structure for diabetes patients to improve their skills to manage diabetes. This includes group meetings; connections to friends online and offline, asking healthcare professionals on managing medication and group discussions. It is crucial that it is easily approachable through clinics, churches, and pharmacies⁶⁻⁸. Even though maintaining and sustaining DSMS follow ups and support is challenging because of limited resources, which include time and caseloads, it offers patients the opportunity to get customized plans and methods following their preferences⁹.

2. Diabetes self-management and education (DSME)

DSME is the process of educating patients on their knowledge of diabetes and their ability to manage essential self-care⁶⁻⁸. In other words, it is another form of traditional diabetes training that includes a variation of physical and behavioral interference. Furthermore, it introduces patients with individual objectives, self-monitoring medication adherence, and other skills⁹.

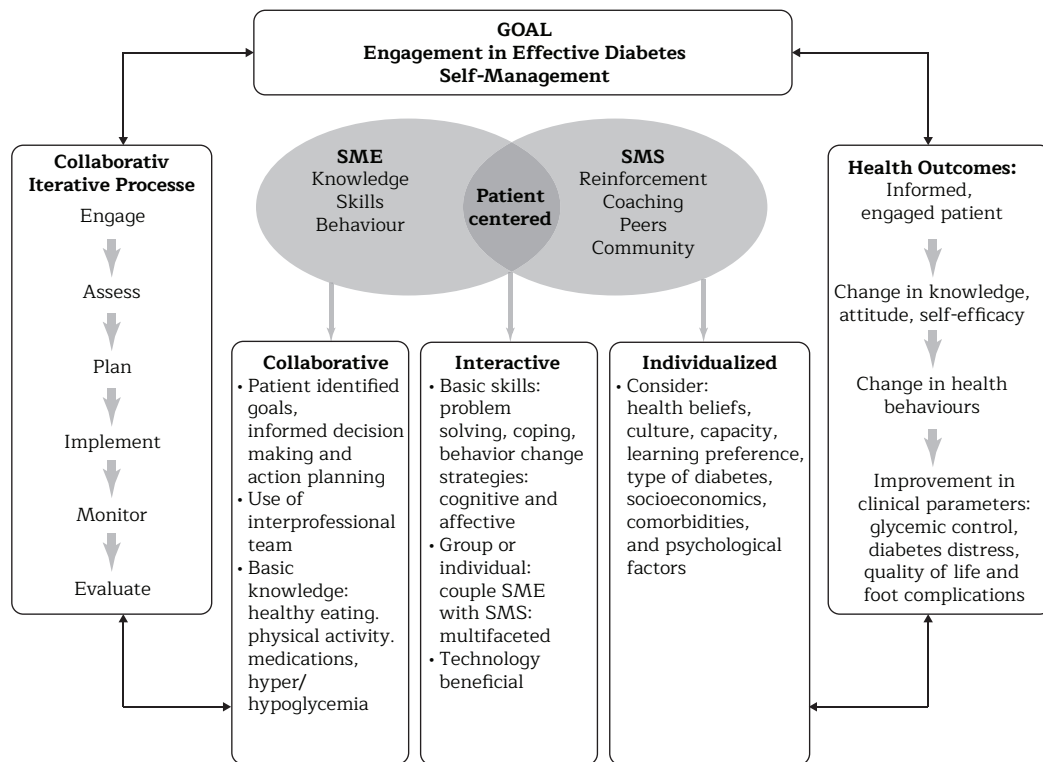


Figure 1 model for self-management education (SME) and self-management support (SMS)⁹

These two types can be associated with gamification methods to encourage more patients to attend and improve with the DSMES service. Gamification is used as an integration to the learning process while maintaining some of the aspects of playing games such as the competitiveness. It attracts patients into an interactive and innovative learning environment, which will result in an increase in engagement in game-based learning spaces⁹⁻¹⁰.

The American Diabetes Association started off the initiative phase of diabetes self-management and support with developers from universities, clinics, and hospitals. When the service is in the process of acceptance, it will be promoted through volunteers and different channels, including websites and other social media platforms. The feedback from the patients would be sent back to the developers to improve the program. On the other hand, when the program is not accepted by the providers, it would be displayed on the ADA website along with the availability of professionals

and support^{6,8}. Likewise, the Center for Disease Control and Prevention or CDC, offers an online toolkit for developers and organizations to follow⁷.

2022 NATIONAL STANDARDS FOR DSMES

The number of patients with diabetes in the United States are at an estimated 34.2 million patients with many having increased risk of hyperglycemia complications. The National Standards is a source that has evidence-based guidance for DSMES. It stresses the importance of cultural diversities, social risk factors, and the development of new technological platforms which can be implemented into the access of DSMES⁸.

The first standard provides a guide to components that can result in sustainability, which consist of sponsor organizations and internal leadership. It can help service providers to overcome barriers which can result in the low utilization of DSMES, including financial and personnel barriers. All of these aspects contribute to the availability and variety

of methods of delivering DSMES services to patients. In addition, service DSMES contributors must determine their target group to magnify the suitability of processes and methods. It can be done by taking characteristics into account such as cultural background and accessibility of technological equipment. Each DSMES team must carefully review the curriculum to guarantee the consistency of service among individuals and the efficient use of resources. Which leads to service delivery, which includes monitoring the patient's medication, identifying risks, and being able to solve problems. Subsequently, a person-centered DSMES is available for patients. Which will include a personal plan based on their preferences and priorities that would be designed by professional medical personnel. The final stage is to illustrate how the patients have improved. This is the job of the tracking team to identify the behavior changes and other evaluations. These evaluations are vital for the team to build on. Eventually, the outcomes can be categorized as process, clinical, behavioral, patient-reported, and health generated¹¹⁻¹³.

OBSTACLES OF DSMES

Identifying the barriers of the DSMES service is crucial for providers to acknowledge in order to sustain and develop the program. These barriers can be categorized into three categories according to the CDC Toolkit, programmatic, provider, and individual barriers. This barrier consists of the lack of resources and personnel in the area of service. It can lead to complications of sustaining and maintaining the standards of DSMES. Lack of knowledge and accessibility leads to confusion among both patients and providers. Nevertheless, concerns and negative experiences can occur following the confusion. This includes the individual errors and the competition between providers. On the other hand, these barriers can be overcome with the toolkit provided by the CDC. Moreover, enhancing the follow up for patients and increasing the

regularity of classes can be the solutions for overcoming individual barriers⁷.

In Thailand, research was conducted with the cooperation of 613 hospitals both public and private, in order to identify the obstacles of DSMES. In 2017, only 53.5% of medical personnel counseled more than 10 patients per day. Factors including patients' reluctance, time deficiency, and disinterest are found to be significant. Patients are unenthusiastic to change their unhealthy lifestyle and attend learning sessions. This can result from other difficulties, which include transportation and poor scheduling. Ultimately, the DSMES service proved to be ineffective in these circumstances¹⁴. In addition, research from Montana State University using electronic health records shows the number of improvements in patients. Conversely, many obstacles are illustrated, which include poor cooperation among patients, the online system, and patient's refusal¹⁵.

THE IMPACTS OF DSMES

The impact of DSMES can be measured by the improvements in a patient's glycemic levels as a result of good decision making and self-management including physical activities and good medication monitoring. In research with 696 patients and the use of mobile applications. It shows that the application has a little to medium effect on the patient's medication, HbA1c level, and BMI. The mean difference in HbA1c level is -3.14, which indicates that patients in this trial have decreased HbA1c levels as per the initial measure. The application itself is said to be well rounded and appropriate for use, although the ability to use the functions of the mobile phone is essential¹⁶⁻¹⁷.

Additionally, research with 22,947 adults with diabetes at an average age of 58.5 years was conducted to see the improvements in the HbA1c level. HbA1c level illustrates the amount of glucose in the blood. The participants are separated into two groups, a controlled and intervention group with 11,093 and 11,854

participants in each group correspondingly. Four types of interventions are presented, including combination, group based, individual based, and remote. With combination interventions being having the most significant impact at 86%. The average change in the HbA1c level in the intervention group is 0.7%. Conversely, the change in the control group is only 0.2%. The levels of HbA1c are separated into 4 quartiles < 7.7, 7.7 to < 8.3, > 8.3 to < 9, and > 9%. Moreover, this study shows that the number of hours of DSMES can have a small impact on patients' HbA1c levels as well. The total average change of HbA1c level in the intervention group with more than 10 hours of DSMES by 0.8%. Meanwhile, patients' HbA1c levels who have less than 10 hours of DSMES decrease by 0.7%¹⁸⁻¹⁹.

CONCLUSION

Diabetes Self-Management and Support is a patient centered service which is aimed to increase the availability of diabetes education and improve treatment outcomes for patients by helping patients with factors that can interfere with their treatment, including limitations, family support, financial status, medical history, and decision making. DSMES can be a tool for patients to self-educate without becoming monotonous. It can be presented in many styles which includes group discussions, digital based applications and gamification. As a result, improved levels of HbA1c can be seen in patients after using DSMES.

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