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Review Article

The Vital Role of Pharmacists in Diabetes Self-care

Pallav Dave *

Regulatory Compliance Analyst, Louisville, KY, 40223, USA

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*Address for Correspondence:

Pallav Dave, Regulatory Compliance Analyst,
Louisville, KY, 40223, USA

Abstract

The number of people affected by diabetes is projected to rise significantly by 2030. As of 2021, 537 million people were living with diabetes with the numbers projected to rise to 643 million by 2030. The growing number of patients living with diabetes means that the demand for care will likely go up. Healthcare providers provide diabetes care more so the regular follow-up required by patients living with the disease. They also work together with the patients in facilitating self-care. Diabetes self-care is instrumental for patients living with diabetes. It ensures patients achieve glycemic control and have a lower risk of having complications. However, for most patients, practicing self-care can be a challenge. Most lack the knowledge and skills that are required to practice self-care confidently. Involving healthcare providers in diabetes self-care can lead to better disease outcomes. Pharmacists can provide the regular follow-ups and other services that lead to effective self-care such as health literacy. Pharmacist-led diabetes management interventions have been shown to lead to good outcomes including better glycemic control and reduced likelihood of having high blood pressure. Therefore, the aim of this review is to explore the role of pharmacists in diabetes self-care.

Keywords: diabetes, diabetes self-care, diabetes complications, pharmacists, glycemic control

Introduction

The number of people affected by type 2 diabetes has increased significantly over the last two decades. Estimates from the International Diabetes Federation (IDF) show that about 537 million people had diabetes in 2021.¹ These numbers are projected to increase up to 643 million by the year 2030.¹ Different factors account for the rise in the number of diabetes cases. They are lifestyle changes characterized by eating unhealthy diets and leading a sedentary lifestyle.² Obesity and the improving life expectancy can also account for the high cases of diabetes being reported.^{3,4} The increasing number of people affected by diabetes means there is more demand for diabetes self-care.

Research has shown that self-care is vital in reducing the occurrence of diabetes comorbidities which contribute significantly to the morbidity and mortality associated with diabetes.^{5,6} Being a chronic disease, diabetes has a lot of complications that significantly affect patient outcomes. Some of these complications are diabetic retinopathy, diabetic neuropathy, foot ulcers, stroke, heart attack, and kidney problems. These complications significantly affect the patient's quality of life and lead to poor outcomes.^{7,8,9} In addition to the complications, patients living with diabetes have continuous needs and demands that require to be addressed to improve health outcomes. For instance, regular follow-up with healthcare providers is instrumental in reducing the likelihood of complications. Strict metabolic control is also important for patients living with the disease. Diabetes self-care is promising when it comes to addressing patients' needs and reducing the likelihood of diabetes complications. Because the patient is responsible for addressing the day-to-day care, ensuring they are knowledgeable on what self-care entails is vital.

Diabetes self-care refers to a set of activities and behaviors that patients living with diabetes practice to manage the disease and ensure positive outcomes. The activities and behaviors include self-monitoring of blood sugar, having a healthy diet plan, adhering to a diet that has low-saturated fat, adhering to medications, foot care, engaging in physical activities, practicing healthy coping skills, and reducing risky behaviors that increase the likelihood of diabetes complications.^{5, 10,11,12} Engaging in these behaviors and activities leads to good glycemic control. Research shows that self-monitoring of glycemic control is vital in diabetes care because it ensures the patients achieve the optimum control.⁵ Attaining good glycemic control is vital for diabetes patients because it lowers the risk of complications.^{13,14} Hyperglycemia has been shown to lead to damage of different body organs leading to life-threatening consequences. Some of the complications associated with hyperglycemia are neuropathy, cardiovascular disease, retinopathy and nephropathy. Although self-care is important in reducing the likelihood of complications associated with diabetes, adherence to these activities remains significantly low. Different factors contribute to low adherence to self-care. One of these factors is the lack of enough healthcare providers to help patients in self-care. Considering the role healthcare providers play in providing care to diabetic patients, they can help patients increase adherence to self-care. Diabetes care is mainly provided by a multidisciplinary team. The team is made up of a primary care provider, an endocrinologist, a dietitian, an ophthalmologist, and a podiatrist, among others. The pharmacist's role in diabetes care is mainly medication dispensing. However, pharmacists can do more than dispensing medications. They can help patients with self-care. The aim of this review is to explore the pharmacist's role in diabetes self-care. The review seeks to find how pharmacists can facilitate

self-care and improve adherence to self-care behaviors to minimize the likelihood of complications and improve patient outcomes in patients.

Diabetes Self-care and Related Barriers

The importance of self-care in patients living with diabetes cannot be underestimated. Research shows that self-care is an important strategy when it comes to the effective management of diabetes and minimizing the likelihood of long-term complications.^{15,16} Self-care minimizes the likelihood of developing long-term diabetes complications because patients take proactive roles in managing their health conditions.^{5,17} Because of being proactive in managing their health, patients are likely to achieve positive outcomes. Some of the common self-care habits and behaviors that are recommended for patients who are living with diabetes are regular physical exercise, complying with a healthy diet, foot care, testing of blood sugar, adhering to prescribed medications, health literacy, and reducing risky behaviors.^{5,18,19} All these behaviors are recognized as instrumental in enabling patients to achieve optimal glycemic control. Regular physical exercise is regarded as important in diabetes self-management. Exercise is regarded as instrumental in diabetes prevention.²⁰ The American Diabetes Association (ADA) recommends that patients who are living with diabetes have at least 150 minutes per week of moderate to vigorous exercise.²¹ Exercise helps patients to maximize insulin action. It also helps patients to improve blood glucose control and prevent patients from getting complications.²² Exercise is also recommended for type 2 diabetes patients as a way of managing their weight. Weight loss is regarded as vital in preventing diabetes because it helps patients to attain a negative energy balance.²³

Complying with a healthy diet is also an important self-care behavior that can improve patient outcomes. Nutrition is regarded as vital in the management of diabetes because it has an impact on weight loss and metabolic control.^{24,25} ADA advises patients with diabetes to have healthy eating patterns comprising nutrient-dense foods in the right portion sizes to attain and maintain body weight goals. Healthy eating habits are also important because they allow patients to attain glycemic control, lipids control, and delay complications. Having a diet plan can enable patients to comply with a healthy diet. A diet plan ensures that the patient knows what to eat and in what quantity. As a result, they are able to get the nutrition they need to ensure their blood sugars are within the required target range.

Another important component of self-care is health literacy. Webber and Guo define health literacy as the ability of an individual to acquire and understand information that is key to their healthcare and the ability to make informed decisions.²⁶ Health literacy makes an individual aware of their health and how to care for themselves. They are more informed on what to do and what not to do relating to their care. Health literacy in diabetes is regarded as vital in leading to positive outcomes including the ability to reach the desired glycemic control targets.²⁷ Patients who have poor literacy have difficulties in managing the disease appropriately because of difficulty in interpreting blood sugar values, understanding symptoms of hypoglycemia, administering medication, and reading labels on pills.^{28,29} They also have difficulty understanding appointment slips, nutrition information, or even education brochures on how to care for themselves. In addition to the limitations in reading and understanding key information that is vital for their care, patients who have poor health literacy have difficulties communicating with their healthcare providers. As such, they may have difficulty expressing themselves or even their concerns to healthcare providers which may impede their ability to meet their self-care targets or goals.

Other important self-care behaviors are foot care, regularly monitoring blood sugar by testing, adhering to medications and reducing engaging in risky behavior. Foot care is important in diabetes. Poor foot care increases the risk of getting diabetic foot ulcers and foot amputation.^{30,31} Regular monitoring of blood sugar levels is also an important component of self-care. It helps diabetes patients identify when blood sugar levels are fluctuating to ensure it is within the target range levels to avoid life-threatening complications.^{32,33} Adhering to medications also enables patients to achieve the required glycemic control. Failing to take medications can increase the risk of diabetes complications.³⁴ Reducing risky behaviors is also important. Some of the risky behaviors that can lead to negative outcomes for diabetes patients are smoking, excessive alcohol consumption, and poor diet. Avoiding such behaviors can lead to positive outcomes.

Diabetes self-care is vital for patients living with diabetes. As evident from the reviewed studies, self-care behaviors contribute to positive outcomes, including achieving targeted glycemic control and reducing or delaying complications. Self-care makes the patient more aware of their health status. As such, they are likely to engage in positive health behaviors that can lead to overall positive outcomes. Although self-care behaviors play an instrumental role in enabling patients to achieve optimal glycemic control, adherence to these behaviors is complex and challenging. For many patients living with diabetes, a number of constraints make it difficult to adhere to self-care behaviors. Financial constraints make it difficult for patients to afford self-care supplies such as testing strips, drugs, and a good diet.⁵ In addition to financial barriers, sociodemographic and cultural barriers can also make it difficult for patients to practice self-care behaviors. Some of the socio-demographic factors that can affect diabetes self-care are age, sex, a patient's living status, a patient's education level, and occupation.^{35,36} Cultural barriers can also affect the ability of patients to adhere to self-care. Cultural barriers influence patients' attitudes towards self-care, beliefs, and health literacy which can lead to poor self-care.³⁷ Other barriers that can affect self-care are poor patient-provider relationships, inadequate healthcare providers, poor adherence to medication, beliefs, health literacy, clinician barriers, and inadequate support.³⁷ Poor compliance with self-care management has been reported globally.³⁸ Because self-care requires patients to make lifestyle modifications, patients who have financial constraints can find it difficult. Addressing these barriers is vital to achieve optimal outcomes for diabetes patients. Healthcare providers can help when it comes to ensuring patients adhere to self-care behaviors. For self-care to be effective, patients need to collaborate with their healthcare providers.

The Role of Pharmacists in Diabetes Self-Care

One of the factors that make it difficult to adhere to self-care behaviors is the lack of adequate healthcare providers to help patients to practice self-care. They play different roles in the self-care journey including providing the education and support that patients require when practicing self-care. According to Powers et al. self-management education and support is vital for diabetes patients because it provides them with the necessary knowledge, skills, and confidence to manage the disease themselves.³⁹ To be able to provide diabetes education and support, healthcare providers need to work together with healthcare providers to address any problems that emerge during the course of self-care, create personal goals, develop action plans, and make informed decisions. Involving more healthcare providers in addition to primary care providers can improve care outcomes. According to a study done by Sorensen et al., general practitioners reported that working together with other care professionals made diabetes care more structured and continuous.⁴⁰ Primary care providers

mainly provide routine care. Other healthcare providers can play other key roles such as listening to patient stories, acknowledging their diabetes education needs, and providing emotional support.⁴⁰ Pharmacists are one group of healthcare providers that can play an instrumental role in helping patients in self-care. Pharmacists can play a role in diabetes self-care because they are accessible and near the patient. Because of their accessibility, they have the ability to address the ever-evolving patient needs more so for patients living with diabetes.

One of the vital roles of pharmacists in diabetes care is dispensing medications as required and ensuring that patients adhere to their medication. One of the self-care behaviors for patients with diabetes is taking medication as prescribed. Pharmacists can do more than just dispense medication. They can educate patients about medication regimens and correct any false beliefs that patients may have about their safety.¹⁸ Because self-medication is an important aspect of self-care for diabetes patients, providing information can ensure patients take medication as required to attain glycemic control. Such information equips patients with the knowledge they need to ensure they take medications as needed and know when to take medication.

Pharmacists are also well-equipped to provide diabetes education and support. Research has shown that pharmacist-led education interventions lead to positive outcomes for diabetes patients including a reduction in HbA1c levels.⁴¹ Pharmacists can provide education on different aspects of diabetes management including disease medication adherence and lifestyle modifications.⁴² Providing diabetes education is essential in diabetes self-care. Education equips patients with the knowledge, skills, and confidence they require to effectively practice self-care. Diabetes education can also entail how to effectively monitor blood sugar. Because of their knowledge, pharmacists are better positioned to educate patients on how to monitor their blood sugar and interpret their blood sugar values.⁴³ Effective monitoring and interpretation of blood sugar values is vital in diabetes because it enables patients to achieve their blood sugar target levels. Achieving blood sugar target levels is associated with lower risks of diabetes complications. Pharmacists can also educate patients on the importance of going to have regular screening to assess for eye and kidney complications.

Pharmacists can play a crucial role as part of collaborative care teams that is involved in providing diabetes care for patients. For instance, they can dispense medication, provide education and support to patients on diabetes self-care, educate patients on diabetes complications, and work with patients to improve diabetes outcomes.⁴³ This is particularly instrumental in resource-strained settings where patients do not get the much-needed support from healthcare providers. Pharmacists can fill this gap and provide the needed support that patients require to improve self-care. For instance, when it comes to adhering to a healthy diet, pharmacists can provide patients with individualized education on what comprises a healthy diet and in what quantities. With regard to physical exercise, pharmacists can ensure patients are knowledgeable about the resources available within the community that can ensure they get the needed amount of physical activity. Different studies have shown that pharmacists are an invaluable resource when it comes to diabetes care with pharmacist-led interventions proving to be promising when it comes to achieving the desired outcomes.^{42,44,45,46} According to Wubben and Vivian, pharmacists' involvement in diabetes care in primary care settings led to improvement in glycemic control with a significant decrease in A1C levels being noted.⁴⁴ In addition to improvement in A1C levels, significant improvements were also noted in other pharmacist-led diabetes management interventions. Great improvement was reported in systolic

blood pressure, diastolic blood pressure, and total cholesterol levels.⁴² Pharmacist-led interventions also improved medication adherence, lipid profile, reduction in cardiovascular risk, and improvement in overall quality of life.^{47,48}

From an economic perspective, pharmacists' involvement in self-care also leads to lower costs of providing care. Involving pharmacists in diabetes care is a cost-effective strategy that can help patients control and manage the disease well hence lowering the risk of complications and subsequent treatment costs for these complications.⁴⁹ The cost of treating diabetes and diabetes-related complications is significantly high with approximately \$237 billion being used annually to treat the disease.⁵⁰ On average, each person uses an average of \$5,876 each year to treat diabetes complications.⁵⁰ Ensuring patients adhere to self-care behaviors can reduce the costs associated with treating diabetes complications.

Different reasons explain why pharmacist-led interventions lead to improvement in diabetes outcomes. When it comes to diabetes self-care, most patients lack the knowledge and skills that are needed to take care of themselves. Lack of knowledge and skills are limiting factors that make it difficult for patients to care for themselves even when they are willing to do so. This is the reason why healthcare providers are an invaluable resource in diabetes self-care. Besides, regular follow-up with healthcare providers is also recognized as instrumental for diabetic patients.⁵ Through regular follow-ups, healthcare providers get to recognize any complications and address them before they worsen. However, because of the shortage of healthcare providers, most patients end up without any support and regular follow-up which leads to poor outcomes. Therefore, involving pharmacists leads to better outcomes because patients have the needed support in their self-care journey.

Based on the reviewed studies, self-care plays an instrumental role in diabetes care. Different studies have shown that self-care leads to improved outcomes including better glycemic control and reduced risk of complications.⁵ Self-care leads to better outcomes because it entails the development of knowledge and awareness about the disease. With this knowledge and awareness, patients are able to perform day-to-day self-care activities with more confidence. Therefore, self-care does not only benefit the patient. It also benefits healthcare systems because it reduces the burden of dealing with the disease and the resulting complications. It also reduces the burden on healthcare systems in terms of the cost of managing the disease and treating complications. However, adhering to self-care is challenging for most patients. Some patients lack the knowledge and skills that are required to perform self-care. Others lack the needed finances to buy medications and other necessities needed to provide care. The lack of adequate healthcare providers is also a barrier to diabetes self-care. Because healthcare providers work in partnership with the client when it comes to diabetes self-care, it is vital to ensure there are enough healthcare providers to facilitate care. Pharmacists can fill this gap by working together with patients in diabetes self-care. They can play different roles including medication dispensing, providing education and support, educating patients on diabetes complications, and working with patients to design diet and exercise plans. Different studies have documented that pharmacist-led diabetes management interventions lead to successful outcomes including lowering HbA1c levels.^{42,44,45} Pharmacists can also serve as a point of access for diabetes medication and treatment that does not need a referral to physicians. Pharmacists provide convenience and ease of access. Unlike physician visits which are associated with long wait times, pharmacists' visits are not likely to have wait times which means patients can access services faster and easily. Therefore, involving pharmacists in self-care provides an opportunity to relieve the already overburdened healthcare

system by ensuring diabetes patients get the needed care and support that can lead to positive disease outcomes. Patients who practice self-care effectively have the likelihood of having a better quality of life. It ensures patients achieve glycemic control, which has been linked to a lower risk of diabetes complications.

Conclusion

With the number of people affected by type 2 diabetes expected to rise in the coming years, the importance of self-care in managing the disease and preventing diabetes complications cannot be underestimated. Diabetes self-care lowers the risk of diabetes complications which is associated with high morbidity and mortality rates of the disease. Self-care are a set of habits and behaviors that patients with diabetes engage in to manage their disease. These habits include self-monitoring of blood sugar, having a healthy diet plan, adhering to a diet that has low-saturated fat, adhering to medications, foot care, engaging in physical activities, practicing healthy coping skills, and reducing risky behaviors that increase the likelihood of diabetes complications. Without proper care, diabetes patients are at a high risk of developing complications. Some of the complications that are associated with diabetes are neuropathy, retinopathy, foot ulcers, stroke, cardiovascular disease, and kidney problems. Diabetes complications make patients worse disease outcomes including morbidity and mortality. It also affects the quality of life. Self-care enables diabetes patients to meet their daily needs. Walking through the journey of self-care with healthcare providers ensures patients have good outcomes. However, because of shortage most patients practice self-care alone which is why adherence is still a challenge. Pharmacists can fill this gap by ensuring patients access the needed medication, adhere to medication regimens, adhere to a healthy diet plan, engage in physical activities, and have the needed knowledge to practice self-care. Research has shown that pharmacist-led diabetes management leads to positive outcomes including better glycemic control. Implementing such interventions can lead to better diabetes outcomes and reduce the risk of complications. It can also ensure that patients manage their conditions better and have a better quality of life.

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