

# The introduction of self-management in Type 2 Diabetes care: A narrative review

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## ABSTRACT

Type 2 diabetes is one of the most life-threatening public health challenges in the world. It causes a high disease burden including increased disability, reduced life expectancy and ever-increasing costs of care in almost every country. The growing burden of diabetes along with rapid cultural changes, aging population, increasing urbanization, changes in nutritional habits, reduced physical activity, and improper lifestyle and behavior patterns would inexorably drive increased health care costs and demands. Several models of education have been proposed to reduce the complications of chronic diseases including diabetes. However, it is widely known and acknowledged that adopting self-care and self-management behaviors play a fundamental role in diabetes control and treatment. A non-systematic (narrative) search strategy was used to collect necessary data. Several models of diabetes care such as compliance-based or curative models exist. Neither the curative model nor the compliance/adherence model is rigorously effective in diabetes care. The model of self-empowerment – based on the three fundamental aspects of chronic illness care: choices, control, and consequences – is much more applicable in the management of diabetes. This point to an approach which recognizes that patients are responsible for their diabetes care. Self-empowerment model has the potential to place diabetes care into context – a context which is based on active involvement of patients and informed, proactive healthcare professionals in the process of care.

**Key words:** Empowerment, model of care, self-care, self-management, type 2 diabetes

## INTRODUCTION

Adult onset diabetes (type 2 diabetes) is one of the most serious healthcare problems around the world. It is

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becoming increasingly prevalent, wherein epidemiological evidence suggests that it will likely continue to rise globally.<sup>[1]</sup> Diabetes is now epidemic, and becomes a growing threat to global health security and a major cause of death, in many low- and high-income countries.<sup>[1,2]</sup> According to World Health Organization (WHO), the number of people with diabetes would globally increase from 171 million to 366 million between 2000 and 2030.<sup>[1,3]</sup> In other words, the prevalence of diabetes would increase from 2.8% to 4.4% between 2000 and 2030.<sup>[4]</sup> Due to this rapid growth and worldwide epidemic, diabetes has been labeled as the ‘silent epidemic’ by WHO.<sup>[1,2]</sup> Substantial evidence now exists to suggest that diabetes is strongly associated with patients’ unhealthy lifestyle, behavioral patterns, and socio-economic changes,<sup>[5,6]</sup> and that both genetic and environmental factors largely contribute to the onset of type 2 diabetes mellitus (T2DM).<sup>[7]</sup> Since 1993, WHO has called for immediate action and rigorous methods to combat diabetes effectively

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in order to prevent the disease and hence improving patients' quality of life.<sup>[1,7]</sup>

T2DM is a chronic endocrinological disorder characterized by abnormalities in glucose metabolism, involving inadequate production and/or utilization of the hormone insulin. It is characterized by hyperglycemia, which implies the presence of abnormally high blood sugar levels.<sup>[8]</sup> Often, long-term complications of diabetes are linked to having high blood sugar. These complications include retinopathy, diabetic nephropathy, neuropathy, coronary artery and peripheral vascular disease, stroke, non-traumatic lower limb amputation, physiological erectile dysfunction, and end-stage renal disease. These complications are totally resulted in a high disease burden including increased disability, reduced life expectancy, and ever-increasing costs of care in almost every country.<sup>[2,5,7,8]</sup>

Undoubtedly, diabetes is one of the most life-threatening public health challenges in the 21st century. As a determinant illness in epidemiologic transition, it affects not only the rich countries and well-to-do social classes, but also the poor countries as well as the working-age population.<sup>[1]</sup> While this cannot be entirely due to the limited healthcare resources or the concurrent allocation of resources to both communicable and non-communicable diseases, they pose a significant health risk to people in many developing countries.<sup>[9]</sup>

According to WHO, developing countries would witness the epidemic of diabetes in 21st century since the number of people living with diabetes is exceeding 70% at the moment.<sup>[4,9]</sup> It is estimated that, in developing countries, diabetes is most prevalent amongst middle age groups (45-64 years of old); however, in developed countries, the target group would be people over 65 years old.<sup>[10]</sup> The prevalence of disease also varies from region to region. In Iran, the prevalence rate of T2DM among adult (25-64 years) is estimated to be between 2-10, depending upon the source and study. In 2005, the prevalence rate of diabetes was estimated to be about 7.7% (2 million individuals),<sup>[11]</sup> wherein a significant burden was posed on individuals, families, and societies.

In terms of mortality rate, diabetes has been also introduced as the fifth leading causes of premature illness and death worldwide.<sup>[8]</sup> Globally, non-communicable diseases including diabetes account for 60% of all deaths. The mortality rate attributable to diabetes in 2010 shows a 5.5% growth over the estimates for the year 2007. This increase is largely due to an 11% increase in the Western Pacific Region, 12% increase in the South East Asia Region, and 29% increase in the number of deaths due to diabetes in the North America and Caribbean Region. In Iran, over 100,000 deaths have been reported as a consequence of diabetes in 2002.<sup>[12]</sup>

Unless addressed, the mortality burden of non-communicable diseases including diabetes will continue to increase dramatically. WHO predicts that over the next decade, the death rates due to these diseases will increase to 17% worldwide. Low-and

middle-income countries, mainly in the African (27%) and Eastern Mediterranean (25%) regions, have experienced the highest increase in diabetes-related mortality.<sup>[13]</sup>

Overall, the growing burden of diabetes along with rapid cultural changes, aging population, increasing urbanization, changes in nutritional habits, reduced physical activity, and improper lifestyle and behavior patterns would inexorably drive increased healthcare costs and demands.<sup>[7]</sup> It is widely known and acknowledged that adopting self-care and self-management behaviors play a fundamental role in diabetes control and treatment.

### Cost of diabetes

The economic burden borne by people suffering from diabetes depends largely on their financial status and the healthcare coverage provided by their countries (i.e. social insurance). Usually, in low-and middle-income countries, people with diabetes and their families bear almost the total cost of the healthcare services they can afford. For example, in Mozambique, Vietnam, and Zambia, diabetes patients pay 75%, 61%, and 51% of their medical care expenditures from their own pockets, respectively. Similarly, out-of-pocket expenses accounted for around 43% of total annual direct costs of diabetic patients in Iran, mainly spent on medications and hospitalization.<sup>[11]</sup> In total, the cumulative annual direct costs of diabetes were estimated to be \$590.676 ± 65.985 million in Iran; almost 53% of this figure contributes to diabetes complications.<sup>[14]</sup>

When expressed in purchasing power parity [current International Dollars (ID)], the estimated global healthcare expenditures to treat and prevent diabetes and its related complications has been around ID 418 billion in 2010. The figure estimated to be at least ID 561 billion in 2030. The average global per capita expenditure attributable to diabetes care was estimated to be ID 878 in 2010.<sup>[13]</sup>

In addition, diabetes and its related complications impose an increasing economic burden on individuals, families, and health-care systems including lost productivity and foregone economic growth. Often, the monetary value associated with disability and loss of life is the largest economic burden caused by diabetes.<sup>[13]</sup> For example, according to WHO, the net losses from diabetes and cardiovascular disease has been ID 557.7 billion in China, ID 303.2 billion in the Russian Federation, ID 336.6 billion in India, ID 49.2 billion in Brazil, and ID 2.5 billion in Tanzania (2005 ID) between 2005 and 2015.<sup>[13,15]</sup> Iran has also been under the threat of diabetics and disease-related complications; where its (economic) burden has been about 306,440 years and 4.72 years per 1000 people, based on Disability Adjusted Life Years (DALYs).<sup>[16]</sup> That is, diabetes would certainly lead to reduced life expectancy and increased loss of life due to its subsequent morbidity.

For many healthcare professionals and academics, a new mode of thinking is required to reduce the economic burden of diabetes, particularly in countries whose resources for

surveillance, prevention, and treatment are severely limited. Such a new paradigm should be easy-to-use, based on the issues of 'interaction, empowerment, involvement, and trust' to be more applicable about day-to-day activities of diabetic patients.<sup>[17-20]</sup> Nonetheless, it is widely acknowledged that low- and middle-income countries like Iran lack the necessary infrastructure to apply this approach. Self-care management or self-empowerment has the potential to help healthcare professionals and academics tackle complex challenges posed by diabetes.

A non-systematic literature search was undertaken in a narrative fashion to provide a summary of evidence derived from primary studies in different countries. The relevant publications were selected and synthesized according to the authors' personal and professional perspectives. Pubmed, web of science, Scopus data sources and the website of the International Diabetes Federation were searched without date limit until 2012 in order to obtain empirical studies of 'self-care management among patients with type 2 diabetes'. Additional records were identified through manual searches of relevant studies in Google search engine. The search was limited to the English, peer-reviewed articles on self-care management and type 2 diabetes. Keywords included: self-care, self-efficacy, empowerment, model of care, type 2 diabetes, and self-management. Multiple keyword sets were applied to maximize results from the searches. Duplicate articles were excluded. In total, 43 studies were included in the review from a range of countries.

### Models of care and education

There has been a great change in managing diseases during the last decades of the past century. Curative and medical approaches towards dealing with patients and diseases have been widely replaced by preventive and participatory approaches where patients' role is critical to managing their care services.<sup>[21]</sup> The term 'curative model' and similar concepts such as 'cure-oriented medicine'-which are widely used in professional and public discourse-concentrates solely on the goal of cure and treatment of acute healthcare problems, and are largely set by health professionals.<sup>[22]</sup> In this context, health professionals are the main authorities responsible for the diagnosis, treatment, and outcomes that their patients' have experienced. It is based on the idea that health professionals know best, and that patient education should be normally prescriptive (e.g., "Do as I say.")<sup>[23]</sup> By time, the model of curative medicine was extended to chronic diseases. However, this approach was based on the belief that patients should have obligation, and be encouraged, to follow the recommendations or direction of their healthcare providers, and that the advantages of compliance prevail over the impact of these recommendations on patients' quality of life. In this context, education is designed to promote compliance or adherence, through the use of motivational enhancement techniques, which inspire patients to make behavioral changes<sup>[23]</sup> Yet, a great body of research repeatedly indicates that diabetes self-treatment is poorly explained by simplistic, compliance-based or curative models, even though they are the dominant modes of treatment in Iran.<sup>[1-3]</sup> This

is largely due to the fact that diabetes management depends highly on a complex array of self-regulation behaviors.<sup>[24]</sup>

### Self-care coping strategies in patients with diabetes

According to the literature, neither the curative model nor the compliance/adherence model is rigorously effective in diabetes care. An alternative paradigm was needed that recognizes that patients are in control of, and responsible for, the daily self-management of their diabetes (i.e. patients self-empowerment).<sup>[17]</sup> This model – based on the three fundamental aspects of chronic illness care: Choices, control, and consequences - is much more applicable.<sup>[23]</sup> Accordingly, the choices that are made by diabetics each day have a larger effect on their outcomes compared with those prescribed by their care providers. Once they leave their doctors' offices, they are in control of which recommendations to follow or ignore. Finally, since the effects of these decisions are directly in favor of patients, they reserve the right, or become responsible, to self-manage their diabetes in ways that best suited their life circumstances.<sup>[23,25]</sup>

Coons *et al.* (1989) suggested that interventions using self-care information would change individuals' attitudes and beliefs concerning their responsibility and involvement in the management of their diseases, reflecting that health care cannot merely be achieved outside the individual's own control by professionals, but it necessitates the patients' active participation in the care process.<sup>[26]</sup> This idea points to self-empowerment approach, which recognizes that patients are in control of, and responsible for, the daily self-management of their diabetes.<sup>[19]</sup>

Broadly, 'empowerment is a process, through which people gain greater control over decisions and actions affecting their health' (WHO, 1998). Patients with diabetes demand long-term and continuous self-care and preventive care behaviors where their role is central in the process of treatment.<sup>[27,28]</sup> In this context, diabetic patients must be encouraged to take responsibilities for their own care and make routine daily decisions regarding their disease.<sup>[29,30]</sup> Self-empowerment has the potential to help patients overcome disease-related barriers and cope with challenges encountered.<sup>[31]</sup> For Cooper, Booth, and Gill (2008), empowerment is a process, by which diabetic patients adopt healthy and appropriate behaviors and improve self-care management.<sup>[32]</sup> Usually, effective self-management of chronic diseases including diabetes - due to adherence to regimen - requires technical skill together with problem-solving competencies to make appropriate adjustments to the self-care regimen.<sup>[21]</sup> Problem-solving is argued to be an effective way in translating techniques of self-management into actual self-care management. By applying problem-solving process, an individual would be able to bring about and maintain behavior change toward a self-improvement goal.<sup>[21]</sup> Despite the potential benefits of problem-solving process in managing chronic diseases, it has not been widely applied to the area of self-management of diabetes.

Patient empowerment involves a patient-centered or consumer-focused mutual approach that helps patients/consumers discover and develop their inherent capacities in order to be responsible for their own life.<sup>[23]</sup> According to this approach, patients are persuaded to become actively involved in the process of their care plan to mutually exchange information with others and to follow the recommendations of professionals towards achieving appropriate outcomes.<sup>[33]</sup>

When it comes to chronic diseases like diabetes, self-empowerment implies a key approach that enables patients to actively recognize and influence their own lives and health status.<sup>[34]</sup> This would help patients make informed choices about their diabetes care and notice that managing their disease is their own responsibility.<sup>[34,35]</sup> Nonetheless, it is important to note that an effective patient empowerment is not achieved unless patients can receive the necessary information, learn about their healthcare issues and conditions, achieve adequate self-efficacy, self-esteem, and self-confidence.<sup>[32,36-38]</sup>

Research into diabetes care shows that it is largely founded in self-management education and patients' readiness to learn.<sup>[39,40]</sup> As they are the most important decision-makers in the care process, they should receive enough instructions to make informed decisions. Knowledge of diabetes creates a basis for informed decisions about diet, exercise, weight control, blood glucose monitoring, use of the medications, foot and eye care, and control of macro vascular risk factors.<sup>[32,39,41]</sup> However, it is important to note that cultural differences, attitudes, financial status, and psychological issues influence the learning experience of patients and their perception of diabetes.

### Factors linked to successful self-care behavior of patients with type 2 diabetes

While it has been recognized that diabetes self-care is multifactorial, previous research has attempted to isolate single factors. Unlike traditional compliance models that rely on exerting pressure to follow recommendations, the main goal of patient empowerment is to provide individuals with the necessary skills and resources they need to make and implement informed choices about their treatment. However, there are several factors that may enhance, or interfere with, patients' self-treatment. Diabetes management depends largely on patients' knowledge of diabetes and their behavioral self-regulation.<sup>[42,43]</sup> Yet, it is an enormously complex process influenced by a broad range of contextual factors including reciprocally interacting individual, socio-economical and cultural factors.<sup>[43]</sup> Albright, Parchman, and Burge (2001) have identified four distinct factors including patient characteristics, doctor-patient relationship, psychological stress, and social context. However, these factors are often ignored or marginalized in most models of diabetes care.

Individuals' cognitive and attitudinal processes as well as individuals' psychopathology and psychological distress have direct effects on self-management and, consequently, significant indirect effects on clinical outcome. It is widely

acknowledged that unreasonable health beliefs, characterized by cognitive distortions, correlate with long-term metabolic control.<sup>[24]</sup> In addition, depressive symptoms, such as reduced energy and motivation, associate negatively with patients' self-treatment and glycemic control. This may expedite the onset of type 2 diabetes.<sup>[24]</sup>

Poor adherence to treatment has also been widely recognized as a major threat to achieving better outcomes for diabetic patients, which is mainly attributed to factors such as willful uncooperativeness or medical ignorance.<sup>[44]</sup>

Socio-demographic variables are also important risk factors that cause poor diabetes management and metabolic control. For example, these factors are known to contribute to glycemic control among African American youths and Caucasian youths compared with others.<sup>[24]</sup> Limited financial resources and patients' low socio-economic status pose further burden on diabetes management as they can cause poor metabolic control and recurrent hospitalization. It is argued that low financial support is associated with an increased prevalence of obesity and T2DM.<sup>[43]</sup>

### Moving forward

Our findings suggest that models based on empowerment thinking have the potential to be applicable for treatment of chronic diseases. Patient empowerment has the potential to place diabetes care into context - a context, which is based on active involvement of patients and informed, proactive healthcare professionals in the process of care. The major benefits to both patients and providers include effective mutual communication, greater satisfaction with care process, improved metabolic and psychosocial outcomes, as well as emotional well-being achievement of recommended standards of diabetes care.

Yet, the current Iranian healthcare system is not providing enough values to dynamically engage patients and physicians in the care process. Indeed, our health system has been poorly designed to develop a new generation of ongoing diabetes self-management support for diabetics. It is at this interface that a major gap emerges between theory and practice, and that a new awareness of self-care management is required. Trends in self-care interventions have evolved over time, involving education plus behavioral models instead of education only. This suggests that enhanced self-care has the potential to improve glycemic control and healing, and that self-care can influence the success of treatment for diabetic patients.

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