Chapter 3

SELF-MANAGEMENT AND MOBILE APPLICATIONS IN DIABETES

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Introduction

Diabetes, which is considered as a major worldwide public health problem (Kisokanth & al., 2013; Kitsiou & al., 2017), is a chronic condition characterized by high levels of blood glucose resulting from the absence or lack of insulin hormones (Shrivastava, Shrivastava & Ramasamy, 2013; Iregbu & Iregbu, 2016; Kitsiou & al., 2017). Being among the major causes of mortality and morbidity, diabetes is one of the biggest global problems of the 21st century (Kitsiou & al.,2017; IDF, 2017). According to the International Diabetes Federation, while an average of 424.9 million people with diabetes were present in 2017, this number is expected to be 628.6 million in 2045. When the number of diabetic individuals in Turkey is considered; it was determined as the 3rd country with the highest number of diabetic individuals after Germany and the Russian Federation in Europa with 12.1% (IDF, 2017). In the Turkey Diabetes Epidemiology Study (TURDEP-II) report, the prevalence of diabetes has been observed to increase from 7.2% to 13.7% with a 90% increase in 12 years (Satman & al., 2002; Satman & al., 2013).

If diabetes cannot be controlled, it causes serious complications that can go back to nephropathy, retinopathy, neuropathy, cardiovascular diseases, stroke, lower extremity amputations and premature deaths (Shrivastava, Shrivastava & Ramasamy, 2013; Iregbu & Iregbu, 2016). It is aimed to provide self-management such as weight management, physical exercise and proper diet in addition to the use of medicines inorder to provide and maintain the normal glycemic level in diabetes and decrease the risk of complications due to diabetes (Iregbu & Iregbu, 2016; Tatara & al., 2013).

Self-Management in Diabetes

The American Diabetes Association defines self-management in diabetes as "the ongoing process to facilitate the knowledge, skills,and abilities necessary for self-care of diabetes" (ADA, 2012). According to another definition, self-management is the ability to manage the symptoms and consequences (physical, social and life-style changes) experienced by an individual due to a chronic illness (Iregbu & Iregbu, 2016). Diabetes self-management is considered to be an important factor in the

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been reported that mobile training application through text messaging has an important impact on glycemic control. However, it has been stated that there is a need for studies with larger sample groups (Saffari, Ghanizadeh & Koenig, 2014). In a pilot study on a smartphone-based application, the mobile application has been found to be effective in lowering HbA1c in diabetics and improving behavioral and diabetic knowledge levels. In the light of these results, information has been provided that smartphone-based health services are a promising tool to improve the outcome and efficiency of diabetes education and management (Zhou & al., 2016). Based on a randomized controlled systematic review of the efficacy of mobile-based applications in diabetes self-management in people with type 2 diabetes, mobile applications have been reported to be effective on glycemic control of diabetic individuals. However, it has been stated that there may be safety problems related to undesirable events such as hypoglycemia and that this should be taken into consideration in future researches (Wu & al., 2017). In another systematic review and meta-analysis on the subject, it has been emphasized that mobile applications had a moderate impact in providing management and glycemic control of type 2 diabetes, and that randomized controlled studies on blood pressure and serum lipid levels should be done in addition. In addition, it is stated that more practical mobile health applications should be designed and studies should be put in place to install these applications into clinical applications (Cui & al., 2016).

However, according to the results of a study on mobile applications in diabetes, it appears that some limitations such as the lack of interest of elderly individuals, the functionality of a bolus insulin dose calculation exist. For example; it is stated that elderly diabetic individuals are less concerned with mobile diabetes applications and the results are not at the desired level. It is recommended that more attention to safety issues for applications with bolus insulin dose calculation functionality should be given and that evidence-based studies are to be done (Hou & al., 2018).

As a result, it can be seen that mobile applications are effective in improving and developing diabetes self-management behaviors such as providing targeted glycemic control in diabetes, preventing acute and chronic complications that may develop due to diabetes, knowledge management related to diabetes, medical treatment management, self-monitoring of glucose level, diet and physical exercise, and that the communication of the individual can become more effective through mobile applications. In order to demonstrate the impact of mobile applications on diabetes self-management, there appears to be a need for longer-term and rigorous studies with larger sample groups. It is also thought that the feedback system should be developed in mobile applications and that mobile applications with more effective interactive systems can be more effective on results.

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