Chapter 19

Review of Serious Games for People with Diabetes

Alexandra Makhlysheva
University Hospital of North Norway, Norway

Eirik Årsand
University Hospital of North Norway, Norway

Gunnar Hartvigsen
The Arctic University of Norway, Norway

ABSTRACT

This chapter aims to illuminate the current state of the field of diabetes-related serious games. First, it describes the problems and difficulties for young people with type 1 diabetes associated with their adherence to treatment regimens. The chapter also discusses various tendencies in the field of diabetes-related games that follow the findings of the systematic reviews performed between 2012 and 2014. Based on the reviews, significant gameplay features of games for health are identified. Further, it presents an example of a smartphone-based serious game developed for children with type 1 diabetes. Finally, this chapter discusses the distribution channel and platforms for serious games and improvements for the status of the field of games for health.

INTRODUCTION

Diabetes is one of the most common non-communicable diseases worldwide. In 2013, 382 million people had diabetes. This number could rise to 592 million by 2035 (International Diabetes Federation, 2013). The World Health Organization (World Health Organization, 2011), the World Diabetes Foundation (World Diabetes Foundation, 2014), and the International Diabetes Federation (International Diabetes Federation, 2013) characterize this development as an epidemic increase in prevalence of diabetes. There are many long-term diabetes complications, including heart disease and stroke, high blood pressure, retinopathy and blindness, kidney disease, neuropathy, and others (International Diabetes Federation, 2013). Moreover, according to the World Health Statistics report issued by the World Health Organization in 2004, diabetes was ranked the twelfth most
common cause of death and could become the seventh leading cause of death by 2030 (World Health Organization, 2008).

Diabetes is rapidly increasing in children and adolescents in many countries. The International Diabetes Federation reports that there are about 490,000 children under 15 years old with type 1 diabetes worldwide (International Diabetes Federation, 2013). As only a small part of the global diabetes burden, with only 5%–15% of people with this form of the disease (Diabetes.co.uk, 2014), type 1 diabetes is the most prevalent form of diabetes in younger people (International Diabetes Federation, 2013). The number of children with type 1 diabetes rapidly increases annually: 78,000 children worldwide are newly diagnosed every year (TeensHealth, 2014).

Usually, financial costs for type 1 and type 2 diabetes are calculated together. However, type 1 diabetes entails the need for insulin therapy throughout one’s entire life, in addition to consultations with endocrinologists, physicians, diabetes nurses, dietitians, and possibly other specialists as well to manage the disease. Medical costs for type 1 diabetes in the U.S. have been estimated at $14.4 billion per year (Tao et al., 2010). In Australia, total costs for type 1 diabetes were estimated at $170 billion in 2011, which could double to $340 billion in the near future (Medical News Today, 2011). Solli and colleagues studied diabetes costs in Norway (Solli et al., 2010), and they reported a total cost of €293 million (both direct and indirect costs) in 2005 for disease management. Direct costs included €95 million for medication (€35.1 million for insulin and analogues), €48 million for disability pensions, €40 million for medical equipment expenditures, and €21 million for hospital stays. Indirect costs, such as sick leave due to diabetes, disability pensions, and basic and supplemental benefits related to diabetes amounted to €70.1 million. Thus, diabetes is a considerable burden for the whole world.

Diabetes is a very individual disease, where everyone experiences different reactions to food, physical activity, and medications. Therefore, the ways to handle the disease in daily life can also be very different. Children with diabetes usually have difficulties understanding their body’s reactions, the seriousness of the disease, and the importance of its treatment, which includes following particular guidelines for diabetes self-management. Sometimes, it can be difficult and frustrating for young children to accept the changes that type 1 diabetes entails, since the disease is a life-long disease.

Generally, children with diabetes do not want to be different from their classmates and friends. However, the everyday life of these children can be perceived as too limited and full of unwanted restrictions. Adolescents will gradually seek greater autonomy and independence in general, but also in diabetes management (Mazur, 2003). Youngsters with diabetes often feel over-monitored and controlled by family members and healthcare workers who “want them to produce good results.” The disease makes it harder to be spontaneous, which is so inherent to much a part of childhood. For that same reason, the implications of the disease can be perceived as overwhelming, especially the requirement to take multiple insulin injections every day. Children may feel there are many reasons to avoid taking insulin. It can be embarrassing, painful, stressful, boring, or time-consuming for children in a hurry, or the child may want to lose weight or may be afraid of being stigmatized. Moreover, a child can become afraid of developing hypoglycemia/hyperglycemia symptoms, or may not want to be seen with such symptoms.

Teens with type 1 diabetes experience not only the typical social and emotional struggles associated with growing-up, but they also face widely fluctuating hormonal changes that affect their diabetes management. Mostly, these fluctuations are related to a growth hormone that stimulates