Sokoon:
A Gamification-Based Cognitive Behavioral Therapy Application – An Application for Depression, Stress, and Anxiety

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ABSTRACT

The World Health Organization (WHO) estimates that depression, anxiety, and stress disorders (DASDs) are prevalent worldwide, resulting in the loss of 13 million years of life and trillions of dollars of economic loss annually. Mobile-based health (M-health) interventions can employ mental health interventions such as cognitive behavioral therapy (CBT) for adolescents worldwide. Arab youth who struggle with DASDs do not tend to engage in mental therapies, but gamification and modularization have the potential to boost their appeal. The authors have selected effective CBT interventions for DASDs, adapted them to digital interactive formats, and integrated gamification concepts. An Arabic mobile application, Sokoon, which means relaxation and relief, may encourage Arab users to practice the required CBT skills for mild-to-moderate DASDs. A pilot study was conducted to evaluate the effectiveness of Sokoon App in a small group of adults who had signs of aDASDs. Sokoon was practicable, well-received by users, and had a positive impact on participants' feelings of anxiety and sadness.

KEYWORDS

Anxiety, C-CBT, Cognitive Behavioral Therapy, DASD, Depression, Game-Based Therapy, Gamification, Hexad Theory, M-Health, Stress

1. INTRODUCTION

University students and teenagers frequently suffer from depression and other mental health problems such as anxiety and stress, which affect their academic performance (Richardson et al., 2012; Riglin et al., 2014; Steptoe et al., 2007). A systematic analysis revealed that the weighted mean prevalence rate of depressive disorders was 30.6% among university students from several countries, including those in the Middle East, North America, East Asia, and the European Union (Ibrahim et al., 2013). Many

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studies (Sachs & Malaney, 2002; Moussavi et al., 2007; Lorant et al., 2007) have found that adverse effects that result from depression, anxiety, and stress disorders (DASDs) can result in the loss of approximately 13 million years of life annually and trillions of dollars of economic loss. However, the development of computerized cognitive behavioral therapy (C-CBT) interventions, which was driven by the necessity to address the unmet needs associated with traditional psychological therapies that are costly and difficult for many populations to access as well as rapidly increasing access to Internet-enabled devices and cheaper software development (Khazaal et al., 2018), has increased during the past decade. Although gaming has become an integral part of everyday teen life, individuals have trouble adapting to and handling its persuasive nature during puberty (Brooks et al., 2015). Recently, games have been employed in many fields such as different therapies and education (Shohieb et al., 2020; Hady & Shohieb, 2020; Kokol et al., 2020; Shohieb, 2018). Gamification refers to the use of gaming elements and mechanics in non-gaming contexts. Because mobile-based health (M-Health) interventions are simple to integrate into users' daily lives, designing a treatment based on this platform may be advantageous because this may lead to increased involvement with C-CBT interventions. Research on game-based cognitive behavioral therapy (CBT) interventions has revealed its potential benefits for mild-to-moderate DASDs symptoms)Khazaal et al., 2015; Leutwyler et al., 2015; Tárrega et al., 2015; Merry et al., 2012). The use of gamification in community health education may appeal to the public and entice gamers to access health promotion materials during leisure time, according to a meta-analytical review (Cheng & Ebrahimi, 2023) that examined the effectiveness of gamified interventions in promoting mental health. The gamified app performs better than the non-gamified app in terms of self-reported resilience, other well-being indicators, and anxiety reduction (Litvin et al., 2020). There is proof that gamification can be successful in encouraging good health outcomes (Fitzgerald & Ratcliffe, 2019) including lowering depression and anxiety symptoms (Damaševičius et al., 2023; Sinha, 2021). This fosters the improvement of psychological issues or the development of mental wellness in people on all sides. However, the most familiar gamified apps do not include all the CBT skills required for DASDs interventions (Dias et al., 2018; Shohieb, 2019; Coyele et al., 2017; Dias et al., 2020; Miloff et al, 2015; Christie et al., 2019; Brezinka, 2012; Addepally & Purkayastha, 2017). There is only one study (Jamaludin et al., 2021) that applied hexad theory with elements of gamification for depression diagnosis, sokoon applied them for treatment. Furthermore, the available DASDs mobile-based CBT interventions have been designed in non-Arabic languages and for other cultures. Consequently, to generalize, such applications are not suitable for most Arab users. In this study, the full design of an Arabic gamified CBT intervention, namely, *Sokoon,* for mild-to-moderate DASDs that accommodates teenagers and young Arab individuals are examined. The main objective of *Sokoon* is to provide Arab young people with mild-to-moderate DASDs symptoms with the opportunity to decrease negative mood and enhance positive mood, life satisfaction, coping skills, and health-related quality of life. It is believed this may lead to enhanced productivity and success for young Arabs, which may subsequently directly increase the national economy. Concerning the gamification user type's classification and Hexad theory, *Sokoon* can be customized and personalized (Andrzej Marczewski, 2018). This is likely lead to the maximization of user motivation, engagement, and consequent usefulness.

2. C-CBT STATE OF THE ART

DASDs have similar symptoms; thus, various treatments such as CBT are utilized to treat DASDs (Rodriguez, 2015; Holland, 2018; Bruno, 2009). Computerized health interventions have increased in popularity because of many factors, including the ease with which information can be exchanged via the Internet and the fact that computers can be mobile, small, and readily accessible (Victoria Barbosa, 2015; Tavares et al., 2015). However, studies have revealed that using fully automated self-help systems is often correlated with low levels of adherence (Andrews & Williams, 2015); therefore, it is imperative that systems developed as psychotherapeutic intervention tools must take user adherence into account to strengthen remote support and bonding.

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