Malath: A Mobile Application for Anxiety Disorder Management

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Abstract

The healthcare field has experienced a transformation by information technology particularly mental health care. The digitalization of cognitive-behavioral therapy (CBT) is one noteworthy advancement. This paper explores Malath application, a cutting-edge application that provides full CBT services, improve the patient's experience, and monitor progress. It is an advancement that is easily accessible and efficient and provides mental health services. This application enables users to monitor their anxiety symptoms, access relaxation techniques, get plans that are specifically tailored to them, and engage with a variety of supportive and educational content. Users can track their anxiety symptoms over time, helping them gain valuable insights into triggers and patterns. Additionally, it provides relaxation exercises, mindfulness practices, and breathing techniques aimed at reducing anxiety and stress . Moreover, it creates an individualized plan tailored to each patient based on their specific diagnosis and condition, encouraging regular use and engagement with the application, fostering a sense of commitment to anxiety management. It is designed for users of all ages, offering content and support that suits their diverse needs. As has been demonstrated, Malath application is transforming mental health by digitizing therapy, offering personalized plans, and empowering users of all ages to effectively manage anxiety and stress.

Keywords: Malath, Anxiety Disorder, Cognitive-Behavioral-Therapy, Augmented Reality

INTRODUCTION

Anxiety is a state of tension, and trepidation associated with particular circumstances. While some tension and anxiety are normal, when these feelings become persistent and interfere with daily functioning, the individual may be diagnosed with an anxiety disorder. Anxiety disorders are often led to social isolation and difficulty managing routine activities. Some people might assume that therapy is ineffective or that they don't need it. Or they refrain it for financial reasons, such as the high cost of therapy, or for other social and cultural reasons, such as the stigma associated with mental illness, which may discourage some individuals from seeking help [1]. According to statistical data, anxiety disorder is one of the most common psychological disorders in the world. In 2019, there were 301 million cases of anxiety disorders worldwide; during the 2020 Covid-19 pandemic [2], this number also increased further also, general anxiety disorder is considered as one of the most common disorders in Saudi Arabia [3].

Advancements in technology have brought about significant transformations in the field of healthcare, particularly in the diagnosis and treatment of mental disorders. One notable development is the adaptation of cognitive-behavioral therapy (CBT) into digital formats, where aspects or even the entirety of therapeutic interventions are delivered through technological devices. In this evolving landscape, the project "Malath" emerges as a pioneering application designed to meet the needs of individuals seeking psychological therapy. Malath, an Arabic word that means a place where a person feels safe, psychologically and emotionally stable, comfortable, and reassured is not just an application; it's a comprehensive solution that streamlines the cognitive behavioral therapy process and enhances the patient's experience. Through this application, individuals can access a range of services that facilitate CBT, a well-established and evidence-based treatment for various anxiety health conditions. Malath represents a significant leap forward in leveraging technology to make mental healthcare more accessible, effective, and patient-centered.

Background and Literature Review

The mobile application field thriving and diverse, and there are several applications for anxiety disorder that offer a smorgasbord of approaches and features to combat mental health difficulties and the ever-present concerns of contemporary living [4]. Malath, stands out as a pioneering application designed to meet the needs of those suffering from anxiety disorders, tackles fundamental difficulties in the treatment of anxiety disorders by delivering a complete and patient-centered approach to cognitive-behavioral therapy (CBT). It acknowledges the obstacles that persons receiving therapy experience, such as difficulties adhering to treatment programs, a lack of desire, and the necessity for ongoing therapist participation in the treatment process.

Several studies indicate that digital versions of cognitive

behavioral therapy (CBT) can mitigate anxiety symptoms with comparable efficacy to face-to-face treatments; thus, proof for the efficacy of smartphone-based therapies continues to increase as it can be used to provide the chance to get the patients engaged in their treatment [5].Furthermore, because children and adolescents spend so much time online, they may prefer digital CBT to traditional therapy [6].

Digital CBT courses are often consisting of a series of standardized sessions given over a set time period that simulate face-to-face CBT therapies. These sessions give psychoeducation on the targeted anxiety disorder as well as instruction on how to apply essential CBT techniques to change the main thoughts, feelings, and behaviors that perpetuate anxiety.

Practical "homework" or between-session exercises, similar to face-to-face CBT, are advised to assist the user learn to self-manage symptoms.Although applications vary in content and delivery method, most incorporate thought monitoring, thought challenging, and behavioral experiments to improve negative thinking patterns and lessen uncomfortable feelings, as well as relapse prevention.While some digital CBT applications may be undertaken entirely on one's own as "self-help," the majority of them require some type of assistance from a specialist, since this method has been demonstrated to help patients stay interested in the application .Specialist help is provided remotely by phone, email, text messaging, or communications transmitted through a secure platform [7].

Similar Systems: The followings are anxiety disorder mobile applications which encompass a range of functions and features aimed at assisting individuals with anxiety disorders in their daily routines.

Wysa: Wysa is a mental health mobile application designed to provide emotional support and guidance to users, by offering tools and techniques to manage stress, anxiety, and other mental health issues. Wysa can provide resources, such as coping strategies, mood tracking, and meditation exercises. This application does not diagnose individuals' conditions and tailor its content accordingly. Instead, it offers general anxiety management tools and techniques that users can apply based on their own assessment of their anxiety needs [8].

NOCD: The NOCD application is a mobile application designed to help people with obsessive-compulsive disorder (OCD) by providing therapy, self-help tools, peer support, symptom tracking, and educational resources. This application provides most of the features, but the effectiveness may vary depending on the specific type and severity of OCD. It does not cover all mental health conditions [9].

Tuhoon : Tuhoon is a mobile application helps to build healthy behaviors through scientific tools such as cognitive behavioral therapy, meditation, mood tracking, relaxation exercises, and guided imagery. The application contains original and renewed audio content. The content varies between meditation and mindfulness sessions, sleep stories, summaries of mental health books, sleep and focus rhythms, relaxation and guided imagery sessions, and other guidance programs provided by the best doctors and psychotherapists [10].

Unwinding Anxiety: Unwinding Anxiety is a mobile application that provide daily informative session lessons and exercises, weekly calls with experts and Identify anxiety triggers and track their progress through journaling. Require subscriptions to paid plans to access all features [11].

Breath Think Do: Breath Think Do is a mobile application that uses interactive stories to encourage kids to use the "Breathe, Think, Do" strategy to calm down, identify their feelings, and work to solve their problems. This application does not diagnose individuals' conditions and tailor its content accordingly. Instead, it provides general exercises [12].

Feelu: Feelu is a mobile application to help children improve their social and emotional development. Teaching feelings and skills to deal with it through stories, examples, and games. Guided meditation exercises and daily feeling journals. Require subscriptions to paid plans to use the application [13].

Table 1 below summarizes the distinctions between the mentioned applications and the Malath application, Malath's unique features of inclusivity across age groups and its non-profit psychological support, where specialists volunteer their time to help patients recover from anxiety. Through the application, patients can book private sessions with specialists and also provide them a plan for CBT appropriate to their condition, where they are reminded to do exercises and tasks.in addition to the leverage of Augmented Reality which is Interactive experience integrating digital objects or information with a real-world environment. This technology distinguishes Malath as a modern mental health application. It provides an innovative approach to therapy. Table 1. Malath and some applications' features

Features	Application System						
	Wysa	NOCD	Tuhoon	Unwinding Anxiety	Breath Think Do	Feelu	Malath
Measure anxiety disorders			✓				✓
Propose CBT plan	✓	✓	✓	✓	✓	✓	✓
Record mood diary	✓		✓	✓		✓	✓
Provide a reminder of the daily activity	✓	✓	✓	✓		✓	✓
Measure performance	✓	✓	✓	✓			✓
Explore educational content		✓	✓	✓			✓
Provide session with specialists		✓	✓	✓			✓
Target all age groups							✓
Use AR technology							✓

MOTIVATION

Team members were inspired to create Malath application for several reasons:

The application will assist patients suffering from anxiety disorders in learning how to manage their thoughts and feelings in an engaging way.

The application combines unique technical features with a comprehensive CBT plan including treatment with AR.

Methodology

Malath project adheres to the waterfall process model [14], in which the whole software development process is broken down into discrete phases, with the outputs of each being as the successively preceding phase's input. The several stages of the Waterfall Model are represented in figure 1 below. Malath's journey began with defining objectives, requirements gathering, and analyzing existing applications and desired features to fully understand the scope and purpose of Malath in the first phase. The design phase created a detailed specification, user flows, and key features were identified and prototyped to provide a visual representation of the software's functionality based on stated requirements. Malath is built based on the approved designs and specifications and translated into a functional software application. Then it went through the testing phase to assess all its features thoroughly and to ensure performance quality and compatibility across devices. All bugs and system defects were documented and fixed before proceeding to the deployment phase. In maintenance phase, customer support, FAQs, and resources are available to assist and support users with any questions or issues they encountered while using Malath. Additionally, new features are being considered for future updates, and users' feedback is being collected and documented to inform further enhancements.
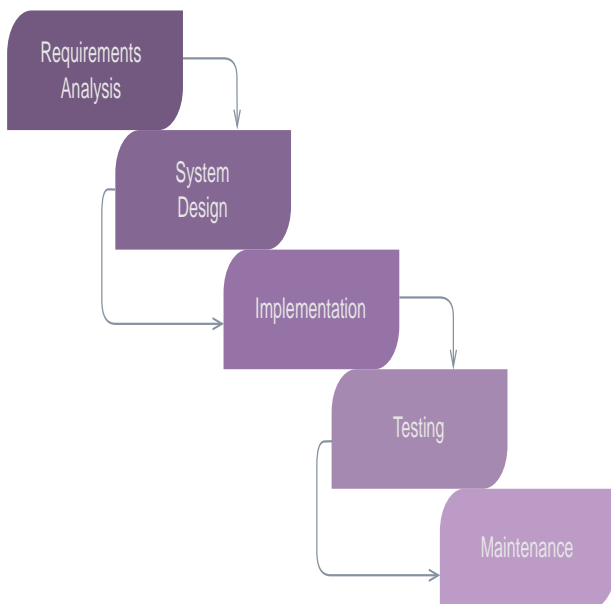

Figure 1 Waterfall process model

The tools used to implement Malath application were chosen based on their compatibility with the software system requirements.

Front-end

Dart is the official programming language of Flutter. It is a modern, open source, high performance object-oriented language that is easy to learn and use. It is also well suited for developing cross-platform applications (IOS and Android), which significantly reduces development costs with a single code base to reach a wide audience.

Back-end

Backend-as-a-Service (BaaS) app development platform Firebase provides hosted backend services. Which has taken in response to the system's need for quick reaction in order to store and sync data across all of their users' devices in real time. BaaS offers elastic infrastructure that automatically scales up or down based on demand. This ensures adequate resources to handle sudden spikes in activity, preventing delays and ensuring real-time responsiveness, also, BaaS integrate with firebase real-time database which allows instant data updates and synchronization across devices, mirroring real-time changes immediately. Furthermore, one of the key system features that must be created is system security. Thus, Firebase is equipped with a variety of capabilities to increase system security, such as user authentication, data access control, and validation.

Implementation

Malath is a purpose-built application dedicated to providing unwavering support for individuals navigating the complex landscape of mental health, with a specific focus on anxiety disorders. Within this nurturing digital environment, users will discover a comprehensive array of features and functions carefully designed to guide them on their unique mental health journey. The system encompasses three classifications of users: administrator, patient, and specialist. Each user category possesses specific access privileges within the system and is expected to be proficient in utilizing its functionalities.

a) **Patient Functions:** Patients using Malath have a wealth of tools at their disposal to support their mental health. They can begin by conducting an anxiety test, enabling them to select a specific type of anxiety disorder and undergo a comprehensive assessment, providing invaluable insights into their mental well-being. Patients can seamlessly perform assignments and exercises, aligning with their prescribed CBT plan to ensure they stay on course. The performance tracking feature empowers patients to monitor their progress within their Cognitive Behavioral Therapy (CBT) plan, promoting accountability and self-awareness. For daily self-reflection and self-improvement, patients can utilize a mood diary, record, and monitor their daily mood and psychological state. The application's educational content offers a treasure of materials provided by specialists enhancing patients' understanding of anxiety and fostering motivation. Users have the flexibility to book appointments, whether urgent or scheduled, connecting with specialists through chat or call for readily available support. Furthermore, Malath recognizes the diverse needs of users, providing separate interfaces tailored for adults and children, ensuring an age-appropriate and user-friendly experience for each demographic.
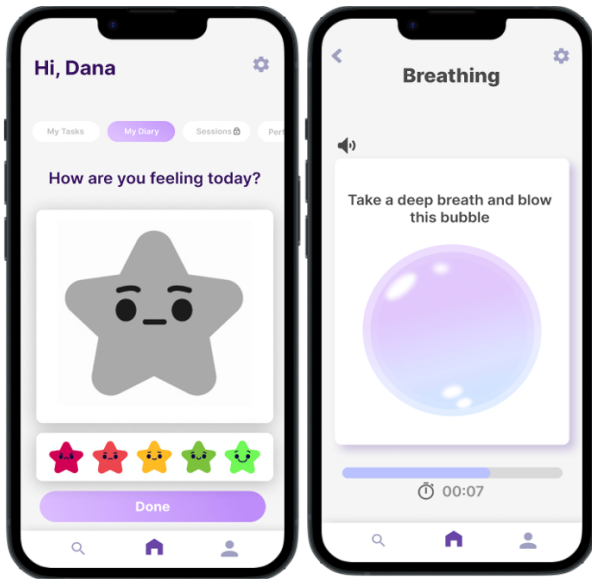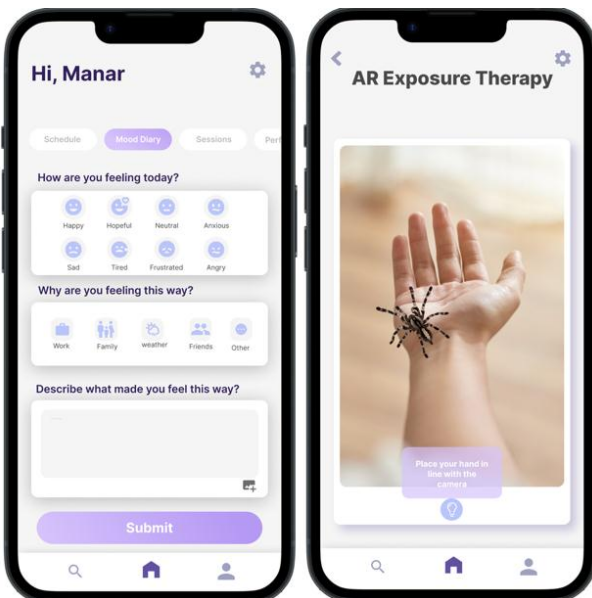
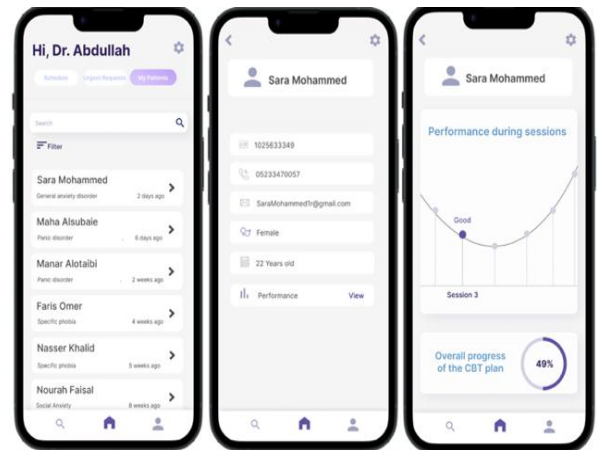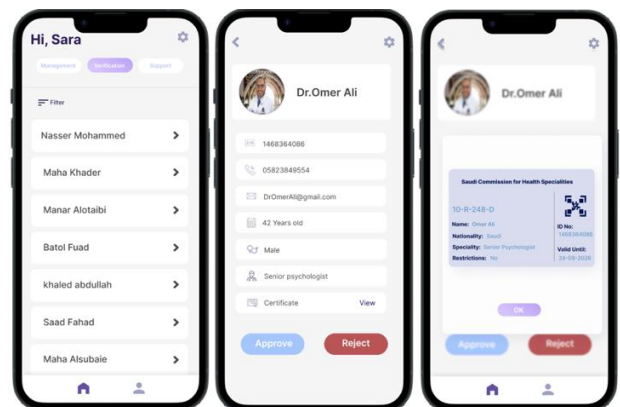**Figure 2**. Kids Interface

Figure 3. Adults Interface

b) **Specialist Functions:** Specialists play a pivotal role within the Malath community, utilizing their expertise to enhance mental health support and aid individuals in their recovery journeys. They contribute by uploading educational and inspirational content for patients, streamlining patient-specialist interactions, and efficiently managing incoming patient requests based on their schedule and availability. To prioritize patient privacy, specialists can access patient information only upon receiving a formal request. This process includes stringent safeguards to protect patient confidentiality, ensuring that access to sensitive information is carefully controlled and authorized. This deliberate approach fosters a confidential environment, building trust and enabling specialists to deliver personalized and effective support.
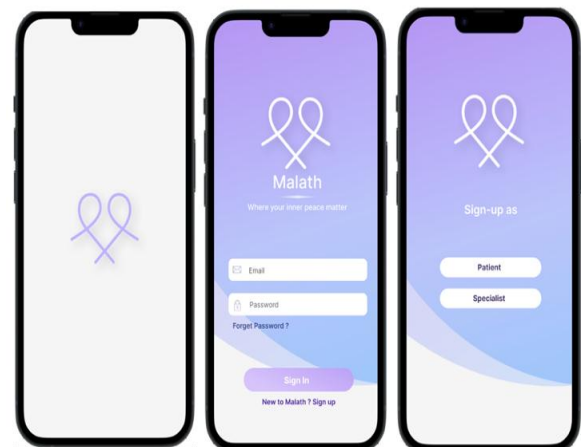

Figure 4. Specialists Interface

c) **Admin Functions:** Administrators uphold the quality and integrity of the Malath platform. The Manage Accounts function allows admins to oversee user profiles, maintaining platform security. Verifying Requests involves approving specialist eligibility, safeguarding the qualifications of those offering support. Admins address user issues, offer answers to FAQs, and assist in technical challenges, ensuring a responsive user experience.

Figure 5. Admin Interface

Figure 6. Common Interface

d) Common Functions: The common functions within Malath provide a strong foundation for user interaction and system security. Sign Up is the entry point, allowing users to embark on their mental health journey by registering and gaining access to the application. Notably, specialist registration is subject to admin verification and confirmation, ensuring that the platform's standards and purposes are upheld. The Login function provides a secure means for users to access their accounts by filling in the required fields, the system swiftly verifies their identity, ensuring secure access. Users are further empowered with the View/Edit Profile function, enabling them to manage their personal information, view, and update it as needed, guaranteeing that their profiles' data remain accurate. The Reset Password function provides a safety net for users who may forget their passwords, offering a secure process to regain access. Lastly, the Log Out function allows users to conclude their sessions securely, prioritizing privacy and security.

Malath as an application in the field of mental health care is carefully considering many ethical and professional implications such as maintaining patients' privacy and protecting their data and ensuring that content and interventions provided in the application are evidence-based, and all specialist in Malath's community are qualified.

The meticulously organized functions within Malath create a compassionate and comprehensive ecosystem. This ensures that users receive the necessary care and support within a secure and user-friendly space conducive to personal growth and healing. This detailed analysis contributes to the understanding of Malath's implementation for mental health support in research and practical application.

Outcome

This paper proposes the Malath application system, designed to address common anxiety disorders and alleviate associated symptoms. Available in both Arabic and English, Malath aims to provide comprehensive support for individuals dealing with anxiety. One of its key features is the innovative use of augmented reality (AR) technology to treat specific phobias. Through AR simulations, users can confront their fears in a controlled virtual environment, gradually desensitizing themselves to triggers associated with their phobias. This approach is backed by research demonstrating the effectiveness of exposure therapy augmented with virtual reality for treating various phobias, including heights, flying, and public speaking [15]. By integrating the latest techniques and studies in anxiety treatment, Malath empowers users to engage in evidence-based interventions from the comfort of their own homes.

Conclusion and Future Work

Malath is a novel mobile application developed to address the growing need for accessible and personalized virtual treatment of anxiety disorders. This innovative platform leverages cutting-edge technology to deliver a comprehensive suite of health services tailored to the unique needs of individuals struggling with anxiety.

Malath represents a significant advancement in anxiety disorder treatment, offering a personalized, accessible, and evidence-based approach to addressing these prevalent mental health concerns. By leveraging the use of Augmented Reality technology and CBT principles, Malath empowers individuals to manage their anxiety symptoms, improve their overall well-being, and reclaim control over their lives.

Future ambitions for the Malath application are to expand it to cover all types of anxiety disorders and offering promising opportunities for developing more engaging and effective anxiety management solutions.by leveraging Artificial Intelligence algorithms to analyze users' data and understand their emotions in order to recommend additional targeted exercises.

Acknowledgment

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