



Mobile Healthcare to Facilitate Stress and Healthy Life Management

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Abstract Nowadays, stress problems continue increasing and become worst due to its poor management and difficult access to diagnosis tool that detect stress. This project work toward developing a mobile healthcare prototype using Android studio to help in managing stress and providing a simple assessment of stress based on a valid and reliable test, DASS-21. This project tries to integrate cultural and religious with technical aspect in solving stress problem. It provides an audio for sample of Quranic verses, hadith, and moral speech to be listened by users as part of a moral stress reliever. This project offers guidance for users toward having a healthy life by calculating the needed calories and how much calories burned via pedometer sensor. This friendly user project helps users to be more aware about their stress and guide them to have a healthy way of living.

Keywords Mobile application; Stress; Healthy lifestyle; Moral stress reliever

1. Introduction

In this era of mobility and information, mobile application become an essential part of software industry. Mobile healthcare I one of the critical field in this industry since it can help to overcome a lot of the current healthcare related problems. Stress is one of the modern life problems. It becomes more crucial to the society and the number of stress-related problem increase in an alarming state. People with stress can be recognized through set of symptoms including psychological signs, emotional signs, physical signs, and behavioural signs. The main reasons that can lead to stress include financial constraints, workload pressure, and academic performance. Stress problems increase due to its poor management, lack of tools and equipment to detect stress and promotes healthy lifestyle. There are several applications that deals with stress management and healthy lifestyle such as U-Healthcare, Wellness Mobile, SaaS platform and deStress [1-4], where some of it can be accessed in form of hand held or wearable device. However, these applications have a main limitation where it is bound with external sensors which represent a drawback or weak point to user who does not prefer to have additional device to their mobile or smart phone. On the other hand the current solution focuses on the technical aspect and may ignore the moral, cultural, and religious aspects. To overcome such weakness there is a need to build a mobile healthcare for stress management (StreMa). It should be able to help sick people whom suffer from stress and promotes healthy way of living.

2. Design of StreMa

In this section, the main design of StreMa as shown in figure 1. It will introduce user to the four sub-functions which are firstly the Introduction to StreMa which provide user with fundamental information about stress. Secondly is Stress Speed Test which is mainly depend on Depression Anxiety Stress Scales or in short DASS [5]. It is a client self-reporting tool designed to measure the severity of the negative emotional states of depression, anxiety, and stress. In this project we select a total of 7 questions for stress subscale, each statement is scored between 0–3, with higher scores indicating greater levels of stress. However, DASS is not a diagnosis



test for psychological disorder but a tool that measure the symptoms of stress. If the test score from DASS shows disturbance symptoms (high stress level), further clinical assessments is advised and should be conducted by experienced clinicians. Thus, for this project, user will provide the answers for the given questions and the result will determine the stress scale of the user. In addition, all of the question and answer scheme for DASS was put inside the database.

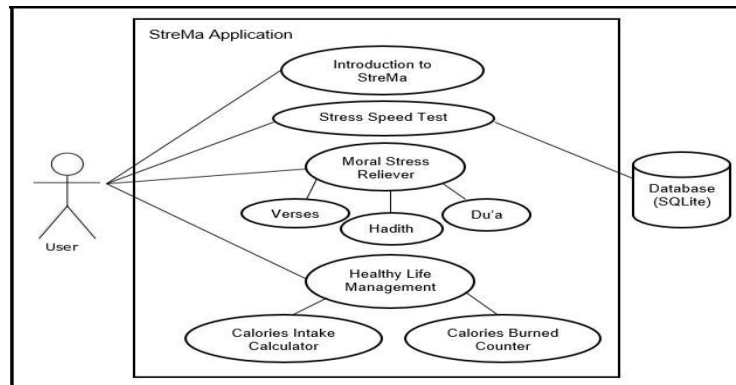


Figure 1: UML diagram for StreMa

Harris-Benedict equation as shown in Figure 2, is aimed to find the right amount of food to be taken by a person through calories calculation. A study indicates the accuracy of the equation with a factor of 1.2 and the use of actual body weight was found to be unbiased and accurate (within 15% of the measured energy expenditure) [6].

BMR:

For men = $66.4730 + (13.7516 * \text{weight}) + (5.0033 * \text{height}) - (6.7550 * \text{age})$

For women = $655.0955 + (9.5634 * \text{weight}) + (1.8496 * \text{height}) - (4.6756 * \text{age})$

Calories Intake:

- Little or no exercise:
Calories = BMR x 1.2
- Light exercise/sports (1-3 days/week):
Calories = BMR x 1.375
- Moderate exercise/sports (3-5 days/week):
Calories = BMR x 1.55
- Active exercise/sports (6-7 days a week):
Calories = BMR x 1.725
- Very active exercise/sports & physical job or 2x training:
Calories = BMR x 1.9

Figure 2: Harris-Benedict Equation [6]

Thirdly is a Moral Stress Reliever, since the population we deal with is mostly Muslims so we have to integrate Islamic resources and moral value in handling stress. Sample of Quranic verses, hadith and du'a were used to reduce stress. The fourth and last sub-function is *Healthy Life Management*. Here, users will be shown how to eat better by providing the appropriate calories intake for them and also how much calories they can burned.

Pedometer sensor is a body-worn motion sensor, usually portable and electronic or electromechanical, that counts each step a person takes by detecting the motion of the person's hands or hips [9]. Next, Pedometer sensor has been used as motivational tools to increase daily levels of ambulatory physical activity due to its effectiveness [10]. This is supported by comparing the number of steps using pedometer with the actual number of steps of participant via videotape that resulting to no significant difference between the video step counts and pedometer step counts [11]. Throughout the project, the database that was used is SQLite. SQLite was used to store the set of questions of the project. SQLite was chosen for this project because it is an embedded SQL database engine that diminished the need to create any server process. Besides that, SQLite reads and writes directly to ordinary disk files as its library access its storage files directly. Lastly, SQLite runs faster the more memory it given even in a low-memory environment.

3. Implementation and Result Analysis

The main interface of StreMa application consists of StreMa main page, Introduction to StreMa Page, Stress Speed Test Page, Stress Reliever Page and Healthy Life Management Page. In the beginning, users will be introduced to the main page of the application as shown in the figure 3 below. Four buttons is shown which are



Introduction to StreMa, Stress Speed Test, Moral Stress Reliever, and Healthy Life Management. The user can choose any of these buttons according to their need. The interface is as shown in figure below.

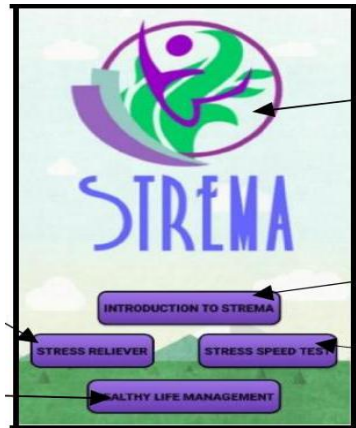


Figure 3: StreMa Main page

3.1. Introduction to StreMa Page

In this page, the information related with stress is provided as shown in Figure 4. Besides that, on this page, the users will be informed on what they should expect to see from this application. Lastly, the user will be provided with Home Page button for them to go back to the main page of the application.

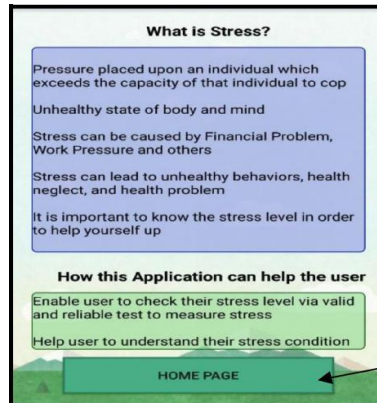


Figure 4: Introduction to StreMa page

3.2. Stress Speed Test page

Next, this is the main actor for the application. On this page the user will required to answer set of test or question. The total number of question that will be asked is seven as shown in Figure 5. The set of questions are stored inside SQLite database and was used as a medium to replace the question. There is also Next button for the user to proceed to next question before reach the result page as shown in Figure 6.

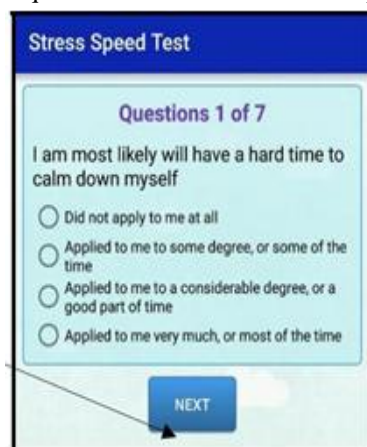


Figure 5: Test Question

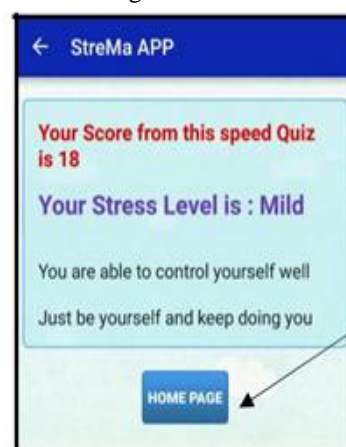


Figure 6: Test result



3.3. Moral Stress Reliever page

Stress reliever page basically touch on the Islamic side on how to handle stress. Once the user click the Moral Stress Reliever button. On this page, user will be provided with three sub-function which are Verses, Hadith and Du'a as shown in Figure 7. Apart from that, user can go back to the home page by clicking the Home Page button.

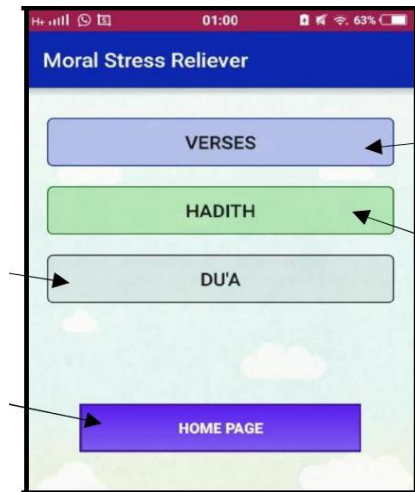


Figure 7: Moral Stress Reliever page

3.4. Healthy Life Management page

This is where the second part of project was implemented. This page is opened once the Healthy Life Management button is clicked as shown in Figure 8. In this section user, will be taught on how to have a healthier way of living by two kinds of activities which are Calories Intake Calculator and Calories Burned Counter. There is also Home Page button that will bring user to main page when clicked.

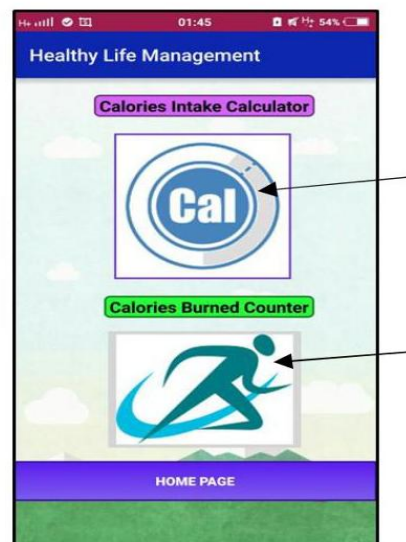


Figure 8: Healthy Life Management Page

4. Conclusion

This project identifies the current weaknesses in mobile based applications which try to serve people with stress. The project identifies the problems and offers a suitable solution for it. It offers a capability to measure the stress level and propose the suitable advises for the user to follow. It also offers guidance for people to manage their health through controlling the number of calories consumed and the burned one. Hence, this application can help to reduce the stress of the users and at the same time promotes a healthy way of living. Lastly, the application provides a user-friendly experience and enables learning environment for the user.



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