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UNICALM: A MOBILE APPLICATION-BASED STRESS MANAGEMENT FOR UNIVERSITY STUDENTS

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Abstract

Stress is a common issue among university students, affecting their academic performance and well-being. This project focuses on developing a stress management mobile application for university students. University students often struggle with stress due to a lack of awareness about stress. Without a solid understanding of stress awareness, such as sources of stress and stress management, people are more likely to have stress. The other people might struggle with a lack of coping mechanisms. They tend to ignore the bad outcomes of stress because they do not get proper treatment. The project implements cognitive behavior therapy (CBT) model features, an approach for a mental health issue, including anxiety and depression. The methodology for developing this application follows Rapid Application Development (RAD). The application is evaluated using the System Usability Scale (SUS). It is also evaluated using the Perceived Stress Scale (PSS), which also consists of a 10-questionnaire that is widely used for measuring the perception of stress. The study had been conducted with 26 participants among UiTM Jasin students. The evaluation results indicated that the application received a high usability score, with an average SUS score of 84.23. Additionally, there was a low perceived stress level among participants, with an average PSS score of 22.15. These findings highlight the potential of the application as a valuable tool for stress management in the academic environment. Lastly, future enhancements in this project have been identified that will expand the range of CBT techniques and resources available within the app to provide a more comprehensive stress management toolkit and add multiple language options to a diverse population

Keywords: Stress; Management; University, CBT Technique, Cope stress

INTRODUCTION

Stress and mental health are gradually turning into major concerns in society. Stress as a normal people's response, enabling them to address conflicts and threats in their lives. Having considered the above factors, stress in Malaysia can be said to be caused by among other things. Nonetheless, on how people manage this factor they feel greatly depends on, daily stress experience greatly affects the overall feeling. It is important to know that stress symptoms and how people cope with them are individualistic. In Malaysia specifically, the survey was conducted by Rakuten Insight pertaining to mental health and wellness in May 2022. As for the correlation between age and changes in stress/anxiety levels, results revealed that 59% of respondents aged 16-24 years experienced higher levels of stress or anxiety. For instance, students who are prone to experiencing stress often due to various challenges are among the most vulnerable groups of people. Some of these manifestations include anxiety, depression, hypertension, and poor digestion (Attia et al. , 2022). A common problem of stress among Malaysian university students is identified as an area of concern resulting from numerous factors such as low awareness and poor management of stress.

LITERATURE REVIEW

Stress on the other hand can be described as the condition or condition of being worried or tense due to certain circumstances. Stress is a universal reaction inherent in people since it helps them overcome or avoid challenges and threats in their lives. Stress is inevitable since all people face stress at some time in their lives. However, the way people cope with stress has an influence on the overall health of the individuals concerned within society. Stress may lead to aggressive and nervous feelings and prevent us from relaxing. Stress has an effect of making it very hard for one to concentrate. They may feel embarrassed or cannot sleep, or they may develop a headache, or other sorts of body illnesses. In some cases, individuals may suffer from appetite loss or struggle with overeating in food. Then, it is possible to identify a great number of university students who struggle with such issues. Chronic stress among university students is now widely assumed to be moderate to high, based on growing research (Alkhawaldeh et al., 2023).

Lack of awareness of stress among university students

The students who took their lives are claiming that 77% of them never attended counseling sessions and the causes for no-show are ignorance, embarrassment, long periods waiting to see a counselor, and out of a belief to resolve issues on their own (Park et al. , 2020). Such populations can fail to get the right assistance they need to manage the conditions affecting them due to their ignorance. Frequently, they are unaware of just how stressed they are until the point that they have experienced either a stress 'break through' or the stress has begun to flag them.

For instance, over 50% of distress and student mental health interviewees did not seek help or treatment for their condition due to mental health stigma (Mofatteh, 2020). It leads to students having negative attitudes about mental illness where they feel like they should be ashamed or find it hard to ask for psychological help. Moreover, the students' awareness was insufficient or non-existent about stress and mental health issues in general that made the students underestimate their symptoms or believe that they do not even have stress and other diseases as curable diseases and need help.

Lack of medium coping mechanism for university students to seek proper treatment

The issue described is the undermined percentage of college students who seek help when experiencing any mental illness. Despite recorded services in campuses offering the assessment and treatment services at a low or no cost, students with confirmed mental disorders' research show that a considerable population does not seek treatment (Hubbard et al. , 2018). This reluctance to seek help is rather worrisome bearing in mind the fact that stressors are common among college students and may have dire consequences with mental health issues unattended to. Due to poor interpersonal communication to seek help and because they lack this social support or because the potential benefits of seeking help are out-balanced by the potential costs.

Not only is self-efficacy one of the essential prevention factors of university distress but also multiple studies have proven that self-efficacy is one of the main factors that impacts the motivational, cognitive, and behavioral aspects of a student to learning process in university among the teaching–learning process (Freire et al. , 2020). One of the evident implications is

that when students are stressed they do not call for help though they are stressed. It might be this way because communication is not their strength, they may not have people they could talk to, or they actually believe that the negative aspects of asking for help outweigh the positive ones.

Type of stress

When people research the different types of stress, they can see how each one affects their physical and mental health (Radhika Kapur, 2021). Stress comes in many forms which are acute stress, episodic acute stress, chronic stress, emotional stress, burnout, physical stress, psychological stress, psychosocial stress, psychospiritual stress, and even eustress, which is actually positive stress. Stress manifests in various forms, each uniquely impacting people's lives and well-being. One of the most common forms is acute stress, which pops up from specific events or situations that people find threatening or challenging. It's short-term but can be quite intense, like the jitters before a big presentation or the nerves after a minor car accident.

Factors of stress

Stress can come from many different factors, and understanding these can help us manage it better. Work is a common source of stress, especially when deadlines are tight, and the workload is heavy. Personal relationships, whether with family, friends, or romantic partners, can also cause stress, particularly when there are conflicts or misunderstandings (Radhika Kapur, 2021). Recognizing these stress factors in our lives is the first step toward finding ways to cope and reduce their impact. Having a support system and using stress management techniques can make a big difference in how we handle life's pressures. It is necessary to identify those students who are at a higher risk of developing mental health problems during college life (Ramón-Arbués et al., 2020).

Coping and managing stress

It's really crucial for everyone to recognize that there are times when coping with stress can be really tough (Friedman, 2020). Everyone faces stressors in their lives, whether it's from work, school, relationships, or other sources. Sometimes, despite their best efforts,

people might not have effective ways to manage that stress. This can lead to feelings of overwhelm, anxiety, or even burnout.

The study highlighting poor stress management practices among students (Hailu, 2020) emphasized how common this struggle can be, especially in environments like college where pressures are high. It's not just about having stress management techniques in theory but it's about applying them effectively in real-life situations.

Cognitive Behavioral Model for UNICALM

The related cognitive-behavioral model for UNICALM focuses on empowering patients to develop improved coping strategies for managing their lives and stress, rather than aiming to cure underlying issues (Kyung Bong Koh, 2018). This approach emphasizes teaching practical skills that individuals can use daily to navigate challenges more effectively, ultimately enhancing their overall well-being and resilience. It's about equipping patients with tools to better handle stressors and improve their quality of life over time.

The project incorporates seven out of ten principles from Cognitive Behavioral Therapy (CBT), emphasizing key aspects such as individual focus, strong relationships, goal-oriented approaches, present-focused interventions, educational components, addressing dysfunctional thoughts, and employing various techniques.

Fundamental Criteria For Stress Management Application

The most reliable method involves reaching out to individuals while they go about their daily routines and asking them to share their thoughts, feelings, and actions in real time. By capturing people's experiences as they happen, researchers can gain a more accurate understanding of how emotions unfold in everyday life, providing valuable insights into humans (Killingsworth & Gilbert, 2010). Two applications were developed with the hypothesis that a well-being mobile app, incorporating relaxation training, breathing techniques, guided meditation, and principles of positive psychology, could effectively reduce stress and enhance well-being (Coelhoso et al., 2019). This approach aimed to provide users with practical tools and techniques to manage stress and promote overall mental and emotional health

Based on previous research, The well-being mobile app helps users relax and manage stress with relaxation training, breathing techniques, and positive psychology principles. It can be effective in ease tension, promote calmness, and build resilience for better overall well-being

METHODOLOGY

Rapid Application Development (RAD)

RAD (Rapid Application Development) is an agile software development approach that prioritizes speed and flexibility. It focuses on quickly producing prototypes and iterating based on user feedback to deliver functional software rapidly. This methodology is particularly effective for projects where requirements are likely to evolve and need to be validated through early and continuous user engagement. (Fatimah et al., 2018). Recent research shows that RAD method has been successfully adopted in various software development projects, including application of Android-based about Indonesian domestic culture (Fatimah et al., 2018).

Phases of RAD Methodology

RAD consists of four phases: Requirements Planning phase, User Design phase, Construction phase and Cutover phases. The figure 1 show basic stages of the Rapid Application Development (RAD) methodology.

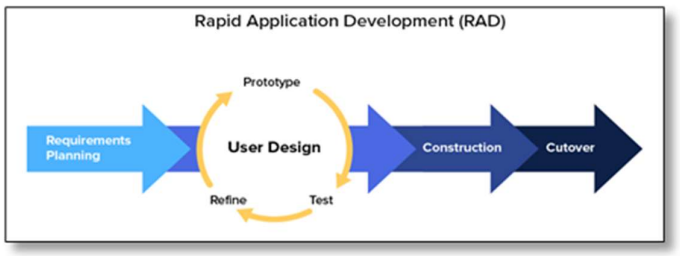

Figure 1: Basic stages of the Rapid Application Development (RAD) methodology

Requirements Planning Phase

This phase is the first phase of RAD methodology. In this phase, it's important to understand and set specific requirements before starting work on this project. The Unicalm application's objective, idea and concept are derived from information gathered from other applications that use the similar concept as Unicalm applications such as Calm, Headspace and Happify applications. Table 1 shows the requirements planning phase.

Table 1: Requirements Planning Phase

Phase	Activities	Technique/ Software	Deliverable
Requirement Planning	Literature Review: 1) Study information about stress management. 2) Study about awareness about stress. 3) Study comparison and similarity the exist application	- No technique/software	1) Information regarding stress management had been researched. 2) Stress awareness was studied. 3) The comparison and similarity of the existing application were evaluated.

User Design Phase

The user design phase where the actual development takes place. In this phase, the prototype was created with different features and functions. This phase ensures user needs are met at every step in the design process. Application design is the most important phase of app development because it makes the app more appealing and interesting, appealing users to use it. A flowchart and storyboard were created in this project to demonstrate the project's flow and design. Table 2 shows the user design phase.

Table 2: User Design Phase

Phase	Activities	Technique/ Software	Deliverable
User Design	1) Design the flowchart 2) Design the low-fidelity storyboard	- No technique/software	1) The flowchart had been designed. 2) The low fidelity had been designed.

Construction phase

The construction phase is a crucial stage of development. Feedback and reviews are crucial at this stage and most bugs, issues, and alterations are addressed during this phase. After developing the Unicalm application's prototype, it needs to be tested by the user with the intention of gathering feedback. After receiving enough feedback regarding the application's functionality, the cycle is repeated until the feedback is positive. Then, proceed to the next phase. Table 4 shows the construction phase.

Table 4: Construction Phase

Phase	Activities	Technique/ Software	Deliverable
Construction	1) Set up database 2) Develop the design and concept of the application 3) Develop the coding	1) Firebase 2) Canva/ Adobe Photoshop 3) Android Studio	1) Firebase database 2) Design and concept application 3) Application

Cutover phase

This is the implementation phase, where the developed software or system is put into action. It involves deploying the finalized solution into the operational environment, ensuring all components work as intended. Implementation includes activities like installation, configuration, and testing to verify functionality and performance.

The target audience for Unicalm is university students. Based on a related study, 26 students from UiTM Jasin are required for the evaluation. Participants should have symptoms of stress or an interest in stress management or relaxation apps but have never used such an application before.

Two instruments are used for evaluation: the System Usability Scale (SUS) and the Perceived Stress Scale (PSS). The SUS measures the application's usability with 10 questions rated on a scale from 1 (strongly disagree) to 5 (strongly agree), evaluating the application's effectiveness in addressing coping mechanisms. The PSS measures participant awareness of stress with 10 questions rated on a scale from 1 to 5, assessing how unpredictable,

uncontrollable, and overwhelming participants perceive their lives. Higher PSS scores indicate lower well-being and more stress symptoms, making it a valid tool for stress awareness measurement.

The evaluation is conducted digitally by distributing a Google Forms link via platforms such as WhatsApp, Gmail, and Telegram. Questionnaires are available in English and Bahasa Malaysia to reach a broader audience. Participants receive a consent form outlining the study's nature and purpose, ensuring confidentiality of their information, and a link to download the application through Google Forms.

RESULT AND DISCUSSION

The first is the System Usability Scale (SUS) questionnaire to evaluate the usability of mobile applications, and the second is the Perceived Stress Scale (PSS) to evaluate the awareness of stress. These two evaluations have proven reliable and trusted to be instruments for carrying out the evaluation that needs to be in this thesis. Through this evaluation and questionnaire, the developer gained valuable feedback from users about the mobile application's strengths and weaknesses. The evaluation has collected 26 participants to complete this thesis. Based on other studies by different researchers, the number of participants is sufficient for testing to be done. Among the participants, there are mostly females (73.1%), while the males are (26.9%).

Figure 2 shows the average participant score of SUS. Each scale has a different score. The mean participant scores 84.23 which is considered excellent for the usability of the system Hence, most participants agree that the Unicalm application system to be usable. In short, the UniCalm application has successfully covered the lack of medium coping mechanisms with a good usability score.

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P	Scale Question										Score
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	
1	4	1	5	1	5	2	5	1	5	1	95
2	3	1	5	2	4	2	4	1	4	1	82.5
3	4	1	4	1	5	1	5	1	4	1	92.5
4	4	2	4	3	4	2	4	2	4	3	70
5	4	1	5	1	4	2	5	1	4	5	80
6	4	2	4	1	5	1	4	1	4	1	87.5
7	5	1	5	2	5	1	5	1	5	2	95
8	4	2	4	2	5	1	4	1	4	1	85
9	4	1	5	1	5	2	4	1	5	1	92.5
10	4	1	5	2	5	1	5	1	4	1	92.5
11	4	2	5	1	4	1	4	1	4	1	87.5
12	4	2	4	2	4	2	5	1	4	2	80
13	4	2	4	2	3	2	4	2	4	2	72.5
14	5	1	5	2	5	1	5	1	5	1	97.5
15	4	2	5	2	4	2	4	1	4	3	77.5
16	3	3	5	3	5	2	4	2	5	3	72.5
17	4	2	5	3	5	2	5	1	5	1	87.5
18	5	2	5	2	4	1	5	2	5	1	90
19	5	1	5	2	4	2	4	3	4	2	80
20	4	1	5	1	5	3	5	2	4	2	85
21	4	2	4	2	4	2	4	2	4	2	75
22	4	2	4	2	4	1	4	1	5	2	82.5
23	5	2	4	2	4	2	4	5	2	5	57.5
24	4	2	4	1	4	1	5	1	4	1	87.5
25	4	1	5	1	5	2	5	2	4	1	90
26	5	1	5	1	4	2	5	1	5	1	95
Mean Score											84.23

*P-participant, Q1 – Q10-Question 1 – Question 10, 1- strongly disagree, 2-disgaree, 3-neutral, 4-agree, 5-strongly agree

Figure 2: The Mean Participant's Score of SUS

Figure 3 shows the mean scores of participants on the Perceived Stress Scale (PSS). Each score on the scale reflects varying levels of perceived stress. The mean participant score of 22.15 falls within the moderate range, indicating that most participants are aware of their moderate levels of stress. Since the mean PSS score is in the moderate range, the participants' awareness of stress is in good condition.

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P	Scale Question										Score
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	
1	3	3	3	2	2	2	1	2	3	3	26
2	0	0	0	3	2	0	4	3	2	1	7
3	1	1	1	3	3	1	3	3	2	2	12
4	2	1	3	3	2	3	2	3	1	2	18
5	2	3	3	1	3	1	1	1	3	1	23
6	4	4	4	1	1	4	2	1	3	4	34
7	4	3	3	1	2	4	1	1	3	2	30
8	2	2	2	2	2	2	2	2	2	2	20
9	2	2	3	2	2	2	3	2	2	2	20
10	2	1	2	3	2	2	3	2	2	1	16
11	3	3	3	1	2	3	1	1	3	3	29
12	2	2	4	1	1	4	1	1	3	3	30
13	3	3	3	1	1	3	1	1	3	3	30
14	2	2	2	2	2	2	2	2	2	2	20
15	1	1	2	2	3	1	1	3	1	1	14
16	1	1	1	3	3	1	3	2	2	2	13
17	3	2	4	3	2	3	4	3	2	4	22
18	2	2	1	2	3	2	3	1	2	2	18
19	4	4	4	1	1	4	3	1	4	1	31
20	1	2	1	3	1	3	1	3	3	2	20
21	3	3	3	1	1	3	1	3	3	1	26
22	0	2	1	2	3	3	1	3	3	1	17
23	3	1	3	1	3	3	1	3	3	1	22
24	0	1	1	3	3	3	3	3	1	3	13
25	4	4	4	0	0	4	4	0	3	4	35
26	4	3	4	3	1	3	1	2	4	3	30
Mean Score											22.15

*P-participant, Q1 – Q10-Question 1 – Question 2, 0-never, 1-almost never, 2-sometime, 3-fairly often, 4-often

Figure 3: The Mean Participant's Score of PSS

CONCLUSION

UniCalm is a smartphone application that offers stress management tools and relaxation techniques to university students. This program is simple to use and provides easy accessibility, taking advantage of students' widespread use of cellphones. UniCalm's tools and information are designed to help users become more conscious of their stress levels, better understand stress, and develop effective coping techniques.

Every project has its limitations, and Unicalm is no exception. One challenge is ensuring user engagement and retention, as keeping users motivated to use the app consistently can be difficult. Another limitation is the application's early release, which may result in limited features and functionality, potentially not meeting users' expectations. Lastly, the app's availability only in English may pose a barrier for non-English speakers, preventing them from fully experiencing its features and functionality.

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