

Original Research Paper

Fight against Obesity Mobile Application

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Abstract: The focus of this research was basic workout guide which provide steps for workout, suggested healthy nutrition and information about health disease. The target user of this research was the adult who confront with overweight and obesity problem. Workout is a set of energetic action or exercise that people can do it everywhere. This research aimed to help the target user to practice the healthy lifestyle by starting workout and eating with balance nutrition. The software of this research will be performed in mobile application. A quantitative method is used to collect the data on user acceptance on the developed mobile application. There were 30 respondents from UPSI invited to answer the questionnaire after using the Fight against Obesity mobile application. The result showed overall mean equal to 4.07, which mean the majority respondents were accept Fight against Obesity Mobile Application. For adult who owned a mobile phone, they can just download this mobile application and start to train themselves to be discipline and solving their weight problem.

Keywords: Body Mass Index, Mobile Application, Waterfall Model.



1. Introduction

Obesity is always the issue in Malaysia where more than 50% of the Malaysian encounter overweight or obesity problem. Body Mass Index (BMI) is used to identify if the person is obese or not by calculated using height and weight. The BMI for Malaysia show that underweight BMI is below 18.5, normal weight BMI is 18.5 to 24.9, overweight is BMI between 25-29.9, and obesity BMI is above 30. The overweight or obesity happened is due to the lack of exercise, imbalanced diet and other causes. The awareness of healthy lifestyle is still low among Malaysian where people still stay at current situation and do nothing. Therefore, we figure out some workout and nutrition that help the overweight or obese adult to improve health by losing weight and eat healthier. Workout have become the new trend for past few of year, the people are doing the exercise frequently to stay healthy. Workout can be explained as a set of energetic physical exercise or practice. Some people are doing the workout because they enjoy but it gently enhanced your health. Workout is helping in develop the healthy environment, people are meeting at some place and exercise together or they can just practice it at home. This environment to guide other people to start thinking of exercise, people become more comfortable to workout when people around are doing so.

Nutrition is vital for diet because it is a process of obtaining necessary food for health and growth. People who gain extra weight because of obtaining too much calories that not necessary. The calories can provide energy for people work, but is the person just sit whole day without working, the calories will stored in our body. If the situation keep repeat, after few weeks it turn into fat and the body weight become higher. So, eating balanced diet can keep us balance between calories and energy needed, where it can avoid from getting fat.

According to the Ministry of Health in Malaysia and the World Health Organization (WHO), 64% of male and 65% of female population are either overweight or obese. As we know that obesity can lead to several of disease like heart attack, diabetes and few types of cancer. 3.6 million Malaysians are suffering from diabetes, the highest rate of incidence in Asia and one of the highest in the world, said Health Minister Datuk Seri Dr Dzulkefly Ahmad. According to latest Statistics on Causes of Death in Malaysia released by the Department of Statistics Malaysia (DOSM), the number of death due to ischaemic heart diseases in Malaysia from 2016-2018, the cases was increasing from 11310 cases, 13503 cases until 18267 cases. The risk factors of ischaemic heart disease were overweight or obese, diabetes, high cholesterol, high blood pressure, smoking, and family history. According to the 2017 Economist Intelligence Unit Limited Report, the economic impact of obesity is the highest in Malaysia with an estimated 19 percent of national healthcare spending. The result obtained is alarming for Malaysian that more than half of the population in Malaysian are classified as unhealthy condition. The awareness among Malaysian regarding to the health problem should be considered as a serious manner.

Regarding to the data that obtained from World Population Review 2019, Malaysian is the highest prevalence of obesity and being overweight among ASEAN's citizens. One of the factors that cause overweight and obese among Malaysian is lack of physical exercise. They are giving a lot of excuse for not exercising. They rather gaming or social with mobile phone than jogging outside. People who start workout or exercise are struggling at the beginning because they do not know the proper ways of exercising, hence causing the lactic acid inside their body generate pain to muscle. This is cause a lot of people to give up easily and feeling hard to continue the workout.

Besides that, the unhealthy diet had led to the increasing of body weight among the Malaysian. Malaysia is known as the country that consists of many delicious foods and the Malaysian love to enjoy all the foods. As the rising cost of the healthy food, the fast food with low price and high fat become the best choice for people to adopt. Furthermore, the food with high cholesterol and sugar such as nasi lemak, roti canai, and kuih-muih become the favourite of people because it is tasty and cheaper for majority citizen in Malaysia. This uncontrol nutrition intake had led the rise the number of obese people. Technology wise, there are not many applications such as mobile apps that help to educate about nutrition intake customized for Malaysian foods. For example, Nutrition Facts, Health and Nutrition Guide & Fitness Calculators, and SuperFood- Healthy Recipes.

2. Literature Review

Physical inactivity and unhealthy diet are included in the unhealthy practice and this can contribute to obesity epidemic on rise [1] [2]. Therefore, people are doing some workout to maintain good health conditions. Such physical workouts are required by a plan, which should be designed and supervised by sport specialists and medical assistants [3]. Support and encourage an active lifestyle by use of mobile applications and wearable technologies has become widespread nowadays [4]. Besides that,

some of important determinants of overweight and obesity are nutrition knowledge, attitudes, and eating self-regulation. The eating intention and behavior have link between eating self-regulation [5] [6].

2.1. Workout Help to Reduce Obesity or Overweight

Obesity or overweight people encounter the high risk of getting development of cancer. A study proposed that physical activity in cancer prevention among population of Sanok's country [7]. There were 157 residents of Sanok surveyed by diagnostic survey and conventional survey. The result determined that risk factor of the cancer were physical activities.

A study proposed the effect of the pools workout weight, body composition, resting energy expenditure (REE), and the quality of life of sedentary obese older women without dietary intervention. 55 obese women around 65-73 years old women were divided in 2 group and separate in moderate-intensity continuous training (MICT) and high-intensity intermittent training (HIIT). The result showed moderate-intensity continuous training (MICT) in pool workout have better outcome on the body composition of the selected obese older women.

Teenagers were become the sedentary population which impact to their health negatively. A study of examine the impact of body fat percentage and cardiorespiratory capacity in a group of teenagers after the high-intensity interval training based on functional [9]. Two intervention groups, in physical education warm-ups over 7 weeks was carried out in form of pretest and posttest. The result was reduction of body fat in the individuals and functional HIIT can be strategy to control obesity among youth.

The paper mentioned a group of with more than 80 % of firefighters struggled with obesity and overweight. A study examined the acceptability and feasibility of HIFT program (TF20) on fire academy recruits' health, fitness, and performance [10] [11]. A control group with 6 participants was asked to continue current exercise habits. While HIFT group with 7 participants undergo 10-week online based training program that included periodized workouts, nutritional information, and mental readiness education. Result showed that body composition and grip strength were improved among the HIFT group, meanwhile the control group did not experience changes.

People wondering about did short-duration, high-intensity exercise training that combines functional aerobic and resistance exercises into training sessions lasting 8– 20 min benefit individuals with type 2 diabetes? A study established that insulin resistance in type 2 diabetes (T2D) can be reduced by F-HIT [12]. There were 13 obesity or overweight adult among 46-60 years old with T2D take part in the F-HIT program. The data showed improvements observation among the obesity/overweight adults with T2D after more exercise program.

A study had proposed on pilot test a new multi-component worksite intervention for weight loss in a primary healthcare setting [13]. 88 participants (43 intervention and 45 control group) were involved in the randomized trial. Good dietary intake and increasing high-intensity interval training (HITT) with motivational interviewing (MI) to support changes were enrolled by the intervention group. Result showed that weight and waist circumference among the intervention group id deducted and they did improve in cardiometabolic risk factors.

There were Schizophrenia patients that suffer from obesity. The study on patients' adherence and the effect of a diet and fitness program among schizophrenia patients were observed by Amiaz [14]. The 9 months diet and fitness program were practiced by 106 stabilized schizophrenia patients. The weight of the patients was successfully reduced after diet and fitness program.

Women who have daily sedentary working hours will contribute bad effect on body composition, cardiovascular and metabolic health. The changes of the body composition and cardiovascular and metabolic health of sedentary female workers after 2 fitness group-workouts had been examined in a study Barranco-Ruiz [15]. 98 inactive and working women aged (38.9 ± 6.4 years) were randomly assigned to three study groups: Control group (CG) = 31, Zumba Fitness® with three one-hour classes per week (ZF) = 39, and Zumba Fitness with 20 minutes of additional Bodyweight strength training (ZF + BW) = 28. As a result, improvements in cardiovascular and metabolic risk in ZF program was better than ZF + BW or CG. Both fitness group workout allowed systolic blood pressure, fat mass and muscle mass improved.

The movement of body can be affected when the human's weight increase. The study investigated the advantages effects of recreational physical activities on the movements [16]. Squatting and vertical jumping of the participants were measured at the beginning and at the end of a 5-month training program according to 5 age categories which is childhood, adolescence, mature age I, mature age II, and aging. In conclusion, the body weight, fat mass, muscle mass, fat mass-body weight ratio, muscle

mass-body weight ratio, body mass index, body fat percentage, and waist-hip ratio showed improvement.

2.2. Awareness of Workout

The awareness of the advantages on daily physical activity was concerned. A study was performed to young adult about the awareness of practice daily physical activities [17]. The questionnaire based on young adult's frequency of daily physical activity, sedentary lifestyle, consuming junk foods were distributed among 120 Chennai young adult. The result showed 39% of young adult still keep physical activities daily or weekly but there were 61% of them did not care about any physical activities.

The development of type 2 diabetes is high risk among the obese people. A study to create awareness about the risk factor of diabetes mellitus and to find the association between obesity and family history of diabetes. A standard questionnaire about relation to their obese condition and family history was prepared to the diabetic patients. The result showed we can avoid various health issues with the awareness about diabetes mellitus. Constant control on their daily diet and physical activities every day is important for people who affected by diabetes.

Children's dietary habits can be affected by teacher because they act as role models. A study on school teachers' awareness about nutrition programs for the prevention of obesity of the Ministry of Education in Turkey had been evaluated [18]. The data collection in form of web-based survey ask question about national nutrition programs (Nutrition-Friendly School Program, White-Flag Protocol, and circular letter on foods can be sold in school canteens). The result showed knowledge among teachers about nutrition educational program were needed to prevent childhood obesity.

Overeating and weight gain in obesity may be caused by difficulties in emotion regulation and deficits then contribute to problematic eating behaviors. A study examined emotion regulation difficulties and interoceptive deficits in obesity among obese patients. Emotion regulation difficulties (CERQ-DERS) and interoceptive awareness (MAIA-FFMQ) were accessed by self-report questionnaires. Result showed more emotion regulation difficulties and less interoceptive awareness among obese participants compare to normal participants did. Lack of planning strategies and emotional awareness among obese people also reported [19].

Disorder of restricted energy intake, having intense fear of gaining weight and has self-perception of their body image is called Anorexia nervosa. A research on awareness about anorexia among adolescents who are experiencing eating disorder and its prevalence in our society was created. A questionnaire was given to 100 teenager's age 12-19 years old. The result performed that most of the teenager choose the unhealthy lifestyle to maintain weight.

2.3. Nutrition

The prevalence of overweight and obesity is caused by uncontrolled fast food and soft drinks consumption that leading to excess calorie intake coupled with lack of acceptable physical activity. A study on habitual facts associated with the prevalence of overweight and obesity among Bangladeshi youth has been observed [20]. 475 youth selected by systematic random sampling attending in 27 established public and private universities and colleges of Bangladesh were involved in cross-sectional study. The trend and threat to overweight and obesity for the Bangladeshi youth was increased proven by the study.

A study on employee overweight and obesity controlled by worksite nutrition and physical activity had been proposed Paredes Gómez [21]. The initial evaluation, collecting anthropometric and analytical data were completed by 558 employees. A multidisciplinary team (nutritionist, personal trainer, doctor and nurse) planned a diet and individualized exercise plan that were re-evaluated at each follow-up visit for 6 months. The committed employee showed reduction of weight and body mass index.

According to Russian Federation, 50-60-year-old men are the greatest years of potential life lost. A study on nutrition patterns in a sample of 41-44-year-old Moscow residents with overweight and obesity proposed Eganyan [22]. Information about the energy value of a diet and the pattern of nutrition of the residents was calculated by constructed mathematical model. According to the result, the intake of protein and fat of the obese person is significantly more compared to the normal person.

There is inconsistent finding on eating frequency (EF) and adiposity in young populations. The methodology used was US children aged 6-11 years (n 4346) and adolescents aged 12-19 years (n 6338) were participated in National Health and Nutrition Examination, where two 24-h dietary recalls in every 3 hours of eating Frequency EF, meal frequency (MF) and snack frequency (SF) with

adiposity measures. As a result, higher EF and SF but not MF corresponding higher risk of obesity in children.

A study noted the relation between nutrition and obesity among the women in India [23]. According to the obesity and overweight was caused by increased consumption of fatty foods, sedentary lifestyle and improved socio-economic status.

2.4. Workout Mobile Application

The statement about workout apps help user to motivate exercise routine was argue by people. The relationship between technological affordances of BodySpace, a highly ranked body building and weightlifting app, and behavioral outcomes (number of workouts tracked, weight lifted, and cardio hours) and goal attainment rate (percentage of body fat and weight goal achieved) had been proposed in a study Molina [24]. There were 682 profile about elicit relatedness, autonomy, and competence predicted exercise outcomes been analyzed. As a result, the motivation of female and male was moderate.

A new mobile health (mHealth) app named Formulift consists of single inertial measurement unit (IMU) and it used to capture users' movements as they exercise, and the app analyzes the data to count repetitions in real time and classify users' exercise technique. Usability, functionality, the perceived impact of the system, and the subjective quality of the Formulift system was examined in the study by O'reilly [25]. A total 15 volunteers were involved in the experimental and distributed in 3 group which were beginner gym-goers, experienced gym-goers, and qualified and practicing S&C coaches. In conclusion usability, functionality, perceived impact, and subjective quality of the system was overall positive.

Smart applications like mobile healthcare, health-aware recommendations, and intelligent healthcare systems were developed by the world with incorporation of IoT. A proposed framework indulges the utilization of Artificial Neural Network (ANN) model, which is comprised of three phases namely, monitor, learn, and predict had been proposed in the study by Bhatia [26]. 5 people with different attributes were performed in the experiment by monitored for 14 days using numerous smart sensors. In conclusion the proposed system is superior in performance and is highly effective in delivering healthcare services during workouts.

The possibility of unobtrusive motion tracking systems and the provision of real-time individualized feedback regarding exercise performance can be done by recent inertial measurement units (IMUs) and mobile computing platforms. 77 healthy participants were involved in the observation where inertial measurement units were positioned on the participant's lumbar spine, thighs, and shanks. As a result, 80% accuracy using a 5 IMU system and 72% accuracy when using a single IMU positioned on the right shank.

In order to allow middle-aged type 2 diabetes mellitus T2DM patients to induce a healthier, more active lifestyle, a game-like software application (MOBIGAME) was developed. A study proved the daily physical activities (PA) in T2DM can be guided by smartphone-based game application. The experimental intervention (duration 24 weeks) includes individualized multidimensional home-based exercise and daily PA promotion administered through MOBIGAME were experienced by 42 T2DM patients (age 45-70). The result showed was vital to provide relevant information for the general transferability of such applications to be used as part of the treatment in other chronic diseases.

Besides that, smart sensors such as accelerometers, video sensors, compasses, gyros, proximity sensors, fingerprint sensors, temperature sensors, and biometric sensors used for various purposes which integrated with smartphones and related devices are currently manufactured with a wide range. Many of these sensors can be automatically expanded to monitor a user's daily activities (e.g., fitness workouts), locations, movements, and real-time body temperatures.

Furthermore, one study had proposed social semantic mobile framework to generate recommendations where a mobile application allows sensing the physical performance, taking into consideration medical criteria with smartphones. For another study, a proactive diabetes self-care recommendation system specifically for AI patients was proposed. It used to fight user's diabetes by suggest healthy lifestyle. The effectiveness of the system was evaluated by use case studies and human expert. Similarity, there was study that develop a health care platform that receives diabetes information generated from various IoT based on remote inputs, stores, analyzes, processes and provides visualized information. Other than that, In the face of America's obesity epidemic, mobile health applications (MHAs) offer solutions for motivating users to be healthier. MHAs include both personal features for the individual user (e.g., calorie tracking) and social features, which connect the user to others (e.g., for support or competition) [9].

Another study claimed that workout trajectories from a mobile sports tracking application can be used to provide automatic route suggestions for bicyclists. The result was the HMM-based method matched correctly on average 94% of the route length. Lastly, a mobile application named MOTION-AE, designed for setting the optimal intensity of the aerobic endurance training, using an intelligent decision making method. A mobile application, MOTION-AE, designed for setting the optimal intensity of the aerobic endurance training, using an intelligent decision making method [7].

3. Methodology

This research used Waterfall model through the development process. Waterfall model consists of six stages as shown in Figure 1.

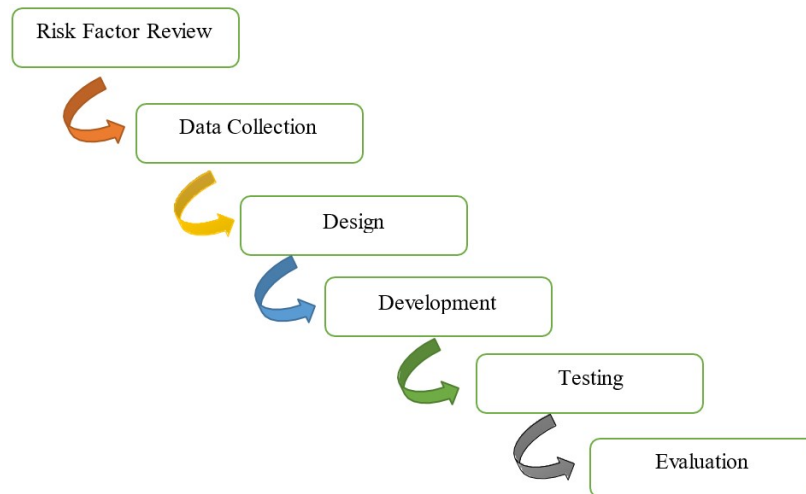


Figure 1. Waterfall Model

This study will begin with Risk factor review. The secondary sources such as article is used to find out the information regarding to children and adult overweight or obesity. The aim of first stage is to identify the causes of children and adult overweight or obesity. Next stage, the data collection in form of questionnaire is developed to collect data from the University Pendidikan Sultan Idris (UPSI) students. After data collection, the design of the mobile application is carried out. The interface of the application is designed to meet the requirement of the study. Then, the development of mobile application will follow up after the design is finished. Some of the software such as Android Studio is used by the programmer to code the program. When the development of mobile application done, the tester will test for the app and investigate if there are any bugs or errors. Finally, the last stage is evaluation that aim to measure the acceptance of the mobile application that been created and people used it are free to give comments.

3.1. Risk Factors Review

In this stage, the risk factors that caused adult overweight or obesity is identified. All the information is found by using secondary sources like article, journals and websites. The review of the literature is defined as a broad, comprehensive, in-depth, systematic, and critical review of scholarly publications, unpublished scholarly print materials, audio visual materials, and personal communications. Besides that, the subject, concept and or problem were determined and discover in the literature review. Strength and weakness of the research found give an idea for the reader to deeply understand on the constraints of their study. The main factors in this study was less workout, imbalanced nutrition and lack of awareness of keep healthy.

3.2. Data Collection

The main factors that identified is used to build the questionnaire for data collection. The questionnaire in google form is distributed to UPSI students and their parents. The amount of questionnaire that will distributed to students are 30 sets. This method was chosen for some reasons such as having the ability to be developed in less amount of time (compared to other data collection

methods), being capable of collecting data from a large number of respondents, allowing numerous questions asked about a subject, giving extensive flexibility in data analysis and finally, being cost effective.

3.3. Design

The documents that necessary for the design are Software Requirement Specification (SRS) and Software Design Description (SDD). By using this “SRS” we are clear about functionality that domain in the mobile application. The user only will consider what the function of the mobile application is and what the benefits is after using the mobile application. Besides that, the non-functionality such as reliability, availability, security, usability and so on will be considered. The diagram that most important for SRS is use case diagram because it reflects all the functionality of the mobile application.

Meanwhile, SDD give idea for the developer on the development of the interface. The SDD focus on how to design and build the mobile application, this is the top task for the development team. The software that required for the design is Umllet, Microsoft word, photoshop and the like are shown in Table 1. It is important to have attractive interface of the mobile app so the users are comfortable when using it. The modelling such as sequence diagram, activity diagram, package diagram and the like are included in the design phrase.

Table 1. Software Used in Design

Software Name	Task
Microsoft word	Used to create and edit professional-looking documents such as Software Research Management Plan (SPMP), Software Requirement Specification (SRS), Software Design Description (SDD), Software Test Plan, Software Evaluation and etc.
Adobe Photoshop	Used to create drawing, logo, or any 2D picture that regrading to the software research.
Umllet	Used to construct the diagram that needed in SRS and SDD suchas Use case diagram, activity diagram, class diagram, sequence diagram and etc.

3.4. Development

Coding is the main for developing the mobile application. The programmer develops the mobile application based on the design that sent to their hand.

Table 2. Hardware Used in Development

Hardware	Description
Laptop	Asus A556, 8 GB RAM, Graphic NVIDIA GEFORCE 930M, Window 10
Mobile device	Huawei Nova 2i, 4GB RAM, OS android.

The duration of the development is long compare’s to other stage because, programmer may take longer time when encounter with solving the bugs and error during coding. The software that used in this research is Android Studio, so the product is only suited with mobile phone with android operating system.

3.5. Testing

Testers are playing the vital role in this stage. They are required to prepare the test plan with number of test cases. The main test method will be used in this software is black box testing. This stage aims

to find out the possible bugs and errors that may occur to the mobile application. The tester also tests if the requirement function match with the function that develop. If there is any error found, the mobile application will be sends back to the developer or the designer to fix the problem. The testing phrase help to minimize the problem that may happen to the mobile application so it is stable and durable for users.

When the research is done the evaluation will be carry on to the research. The product which is the mobile application will be release and used by particular users. 30 participants will involve in enrolled the function inside the developed mobile application. The body weight of the participant is recorded by themselves and use for analysis later. The questionnaire about the user acceptance will be distributed to the users after they use it. The feedback of user will be stored and the improvement the mobile application will be done in future. Besides that, the contents of the thesis will be evaluated by the lecturer and marked.

4. Finding and Discussion

4.1. User Interface of the Fight against Obesity

The user interface design mainly focuses on the look and style. It aims to attract user attention which enable user find easy to use and pleasurable. Figure 2 shows the user interface of the fight against obesity.

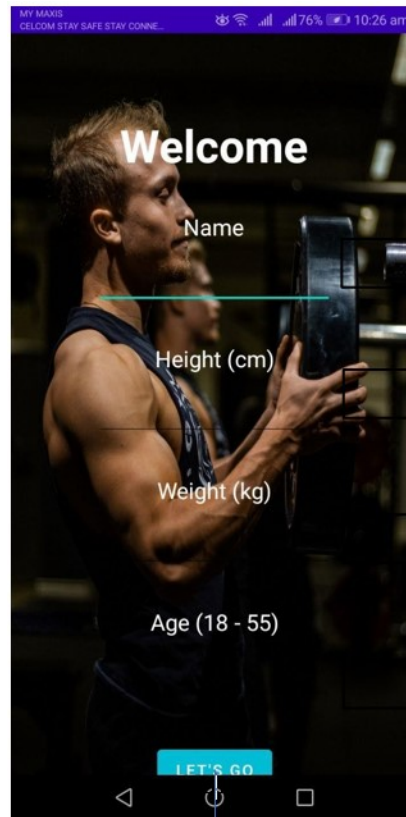


Figure 2. User Interface of the Fight against Obesity

4.2. Finding

In this part, the user acceptance data that collected from the respondents on the title of “Fight against Obesity Mobile Application” is analyzed. The method that used in this analysis is Mean.

4.2.1. In Relation to Other Workout Software I Have Used, I Found the Fight against Obesity Mobile App Is Easy To Use

Table 3 indicate the rate on “In relation to other workout software I have used, I found the Fight against Obesity Mobile App is easy to use”. Respondents had to rate from 1-5. There were 30

respondents in this category. There were 3 respondents who rate for 2 (10%), 2 respondents rate for 3 (6.7%), 17 respondents rate for 4 (56.7%), and 8 respondents rate for 5 (26.7%). So, from there we can see that Fight against Obesity Mobile App is one of the software the user found it is easy to use.

Table 3. Questionnaire: In relation to other workout software I have used, I found the Fight against Obesity Mobile App is easy to use

Rating					Mean
1	2	3	4	5	
$\frac{0}{30} \times 100\%$	$\frac{3}{30} \times 100\%$	$\frac{2}{30} \times 100\%$	$\frac{17}{30} \times 100\%$	$\frac{8}{30} \times 100\%$	$\frac{3 \times 2 + 2 \times 3 + 17 \times 4 + 8 \times 5}{30}$
=0%	=10%	=6.7%	=56.7%	=26.7%	= 4

4.2.2. Convenience of Watching the Suggested Workout Video

Table 4 indicate the rate on “Convenience of watching the suggested workout video”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 4 respondents rate for 3 (13.3%), 16 respondents rate for 4 (53.3%), and 10 respondents rate for 5 (33.3%). So, from there we can see that user think it is convenience to watch the suggested workout video.

Table 4. Questionnaire: Convenience of Watching the Suggested Workout Video

Rating					Mean
1	2	3	4	5	
$\frac{0}{30} \times 100\%$	$\frac{0}{30} \times 100\%$	$\frac{4}{30} \times 100\%$	$\frac{16}{30} \times 100\%$	$\frac{10}{30} \times 100\%$	$\frac{4 \times 3 + 16 \times 4 + 10 \times 5}{30}$
=0%	=0%	=13.3%	=53.3%	=33.3%	= 4.2

4.2.3. Every Information in the Workout Video is Clear

Table 5 indicate the rate on “Every information in the workout video is clear”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 5 respondents rate for 3 (16.7%), 12 respondents rate for 4 (40%), and 13 respondents rate for 5 (43.3%). So, from there we can see that users are agree that every information in the workout video is clear.

Table 5. Questionnaire: Every Information in the Workout Video is Clear

Rating					Mean
1	2	3	4	5	
$\frac{0}{30} \times 100\%$	$\frac{0}{30} \times 100\%$	$\frac{5}{30} \times 100\%$	$\frac{12}{30} \times 100\%$	$\frac{13}{30} \times 100\%$	$\frac{5 \times 3 + 12 \times 4 + 13 \times 5}{30}$
=0%	=0%	=16.7%	=40%	=43.3%	= 4.27

4.2.4. The Application Design is Suitable for Suggested Nutrition

The rate on “The application design is suitable for suggested nutrition”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 1 respondent rate for 1 (3.3%), 2 respondents rate for 2 (6.7%), 7 respondents rate for 3 (23.3%), 14 respondent rate for 4 (46.7%), and 6 respondents rate for 5 (20%). So, from there we can see that some of the user not satisfied with the design for suggested nutrition.

4.2.5. The Risk Disease in Mobile Application Increases the Awareness of Users about the Importance of Loss Weight When Overweight or Obese

The rate on “The risk disease in mobile application increases the awareness of users about the importance of loss weight when overweight or obese”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 8 respondent’s rate for 3 (26.7%), 12 respondent rate for 4 (40%), and 10 respondents rate for 5 (33.33%). So, from there we can see that the risk in mobile application can increases the awareness of users about the importance of loss weight when overweight or obese.

4.2.6. The Set Timer Function is Useful to Remind Users about the Workout Time

The rate on “The set timer function is useful to remind users about the workout time”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 4 respondent’s rate for 3 (13.3%), 14 respondents rate for 4 (46.7%), and 12 respondents rate for 5 (40%). So, from there we can see the user is satisfied where the set timer function is useful to remind users about workout time.

4.2.7. All Functions That I Expected to Find in Menu are Presented

The rate on “All functions that I expected to find in menu are presented”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 8 respondent’s rate for 3 (26.7%), 14 respondents rate for 4 (46.7%), and 8 respondents rate for 5 (26.7%). So, from there we can see the majority user agree that all functions that they expected to find in menu are presented.

4.2.8. I Immediately Understood the Function of Each Button

The rate on “I immediately understood the function of each button”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 1 respondent rate for 2 (3.3%), 6 respondents rate for 3 (20%), 16 respondents rate for 4 (53.3%), and 7 respondents rate for 5 (23.3%). So, from there we can see majority of the user immediately understood the function of each button.

4.2.9. The Fight against Obesity Mobile Application has Potential to be Commercialize

The rate on “The Fight against Obesity Mobile Application has potential to be commercialize”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 1 respondent rate for 2 (3.3%), 5 respondents rate for 3 (16.7%), 18 respondents rate for 4 (60%), and 6 respondents rate for 5 (20%). So, from there we can see majority of the user think that Fight against Obesity Mobile Application has potential to be commercialize.

4.2.10. I Would Recommend this Mobile Application to My Friends

The rate on “I would recommend this mobile application to my friends”. Respondents had to rate from 1-5. There were 30 respondents in this category. There were 5 respondents rate for 3 (16.7%), 14 respondents rate for 4 (46.7%), and 11 respondents rate for 5 (20%). So, from there we can see majority of the user will recommend this mobile application to my friends.

4.3. Discussion

In a nutshell, the result of overall mean show that the overall mean equal to 4.07, that mean’s the majority respondents were satisfied with Fight against Obesity Mobile Application. Regarding to the data that we obtained from the respondents on the user acceptance test on Fight against Obesity Mobile Application, the result showed the overall mean was 4.07. We can conclude that majority of the users accept this Fight Against Obesity Mobile Application as tool that can help user to keep healthier life style by following the suggested nutrition and workout in this mobile application.

5. Conclusion

The decline of obese and overweight adult in Malaysia is needed to increase the productivity of the country via decrease the spending in health care. By using workout mobile apps like Fight against Obesity Mobile Application, we can also see how technology guide us toward a healthy lifestyle. It helps people struggle with overweight and obesity to gain balance diet and train themselves to build healthy body through workout. At the same time, increase the awareness of obese and overweight adult the importance of keep fit to avoid disease such as cancer and cardio-vascular disease. A lot of research has been done on keep body health, based on the analysis and mobile application that made, we hope this thesis will be a great help in helping them to keep body health.

There were few suggestions for improvement on this research. For example, create duration of rest time between the workouts, add multiple languages, create better nutrition suggestion, add heartbeat rate and calories burned, and add more function. Despite there were majority users accept this mobile application, but there are many parts in this mobile application need to improve in order to give best experience for the users.

There were few feedback collection from respondents about the improvement and suggestion that can be add in this research for future.

1. It is better if it can link to Youtube.
2. Maybe can add in step counter or anything that can track my exercise duration and my consistency
3. Create better nutrients menu that can provide different proportion
4. It will be better if there's a consultancy button for the people who used the apps to look for help.
5. Create the duration for rest for example setting 1 minute rest after a set.
6. Need add more function.
7. Perhaps can include mixture of cardio workout and calorie intake tracker that the user can type in manually.
8. Can add in the heartbeat rate and calory measure.

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