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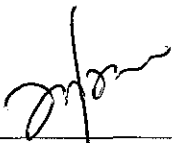
One Stop Centre for Anorexic

by

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TRONOH, PERAK

MAY 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

NORSILA BINTI MAHRAM

ABSTRACT

Anorexia Nervosa is an eating disorder that leads to death if left untreated. Anorexic will strive to be as thin as they can. They will deny food and do extreme exercise to have an ideal weight, but they not realize that they already underweight. The purpose of this project is to develop a website that uses persuasive theory in order to persuade anorexic to overcome their eating disorder and to develop an Anorexia website especially for Malaysian that will act as support system and interaction medium between anorexic and dietician. By login to this website, Anorexic would able to follow diet and nutrition plan and can communicate with dietician directly in forum column. In order to achieve this objective, the author will do a lot of research in order to have deep understanding about anorexia nervosa, persuasive theory and how to design and develop a website. The methodology used for designing and developing this website is Rapid Application Development (RAD) which consists of four core phases which are planning, analysis, design and development and implementation. Apart from that the author also included the result and findings from the survey carried out. The website interface designs are also included based on the comparison of existing anorexia website and user feedback. Finally, the result from the usability test that has been carried out is also included. Last but not least the author concludes with few recommendations in developing this website.

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INTRODUCTION

1.1   BACKGROUND

According to Otong (2003), Anorexia nervosa refers to a syndrome manifested by self-induced starvation resulting from fear of fatness rather than from true loss of appetite. Person with this eating disorder known as anorexic, will continue feel hunger but persist in denying themselves food. The diagnosis of Anorexia nervosa requires that weight be 15% below the expected for age and height, Frisch and Frisch (2002).

Obviously, we live in a diet-conscious society in which thinness is viewed as attractive and healthy, Fitzgibbon and Stolley (2001). This mindset has plagued the mentality of younger generation, that make them become obsess in their weight and body image then set their mind to become as thin as they can. It most often consists of a single episode with return to normal weight, but it may be episodic or unremitting until it leads to death. Reportedly, mortality rates of this disorder range from 5 to 21 percent, Otong (2003).

In Malaysia eating disorder are rising especially among young females. From a study done by chartered psychologist Dr. Hera Lukman, one in 10 young urban female college students are prone to eating disorders in their quest for a perfect body shape, Ng (2007). Though Government and Private hospital do offer treatment for anorexic to seek help from dietician, but cost and time constraints leaves them untreated. Treatment in government hospital usually will take a long process before anorexic can actually meet the dietician and usually anorexic will see back their dietician only once or twice in a month. Moreover, dietician cannot offer 24 hours service and support. Anorexic need a strong support from their dietician and family members as they need to be monitored to overcome these eating disorders.

There are no systems or website available yet in Malaysia that provides references, two way communication and support for anorexic. The purpose behind this research is to develop a website that uses persuasive theory in order to persuade anorexic to overcome their eating disorder. One Stop Centre for Anorexic (OSCA) will include all information about anorexia and provide daily services and support like diet and nutrition plan that can be followed by anorexic and forum section with dietician. OSCA also will act as a medium of interaction between anorexic and dietician after anorexic undergo treatment in hospital.

1.2 PROBLEM STATEMENT

Anorexia nervosa needs to be treated because this disorder will lead to death if left untreated. Based on research done by Steele (2007), refer Figure 1, 20% of anorexic will prematurely die from the complication related to their eating disorder, including suicide, 30% will died in 10 to 20 years times and only 40% will fully recover, that is less than half. That makes new approach of treatment need to be introduced to help anorexic overcome their eating disorder.
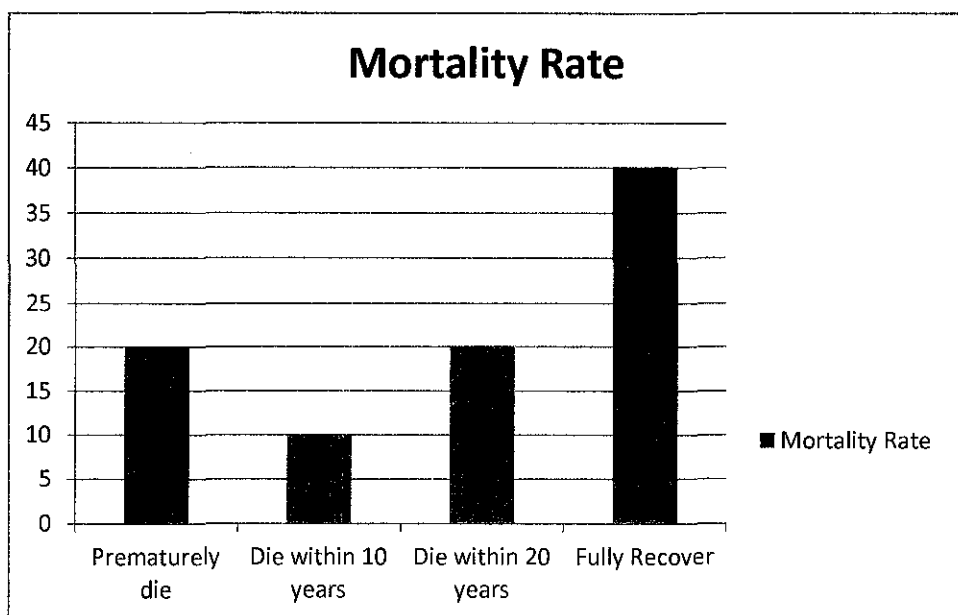

Figure 1: Mortality Rate graph

In Malaysia hospitalization treatment are time and cost consuming and not effective enough. Example there is no Treatment Centre available in Malaysia, which makes Anorexic need to go to Singapore to have individual treatment that will cost about RM 1000 per treatment. Therefore, a website that offers two way interaction approaches is needed as a support system in order to help anorexic in improving their lifestyle towards a healthy lifestyle.

Since anorexic already have mindset; which being beauty is judged based on their thinness, the persuasive approach will be used in way to persuade anorexic to change their mindset into healthier lifestyle. Moreover anorexic has personality characteristics where they are obsess about doing things right and have psychological fear in gaining a normal weight. This makes persuasive theory suitable enough to be used as a way to persuade and influence anorexic.

1.3   OBJECTIVES

The objectives of this project are as follows:

- To develop an Anorexia website especially for Malaysian that will act as support system and interaction medium between anorexic and dietician.
- To develop a website that uses persuasive approach in order to persuade anorexic to overcome their eating disorders.

1.4   SCOPE OF STUDY

1.4.1   The Relevancy of the Project – Scope of Work

Scope of study for this project involves current research paper and book to develop a deep understanding about Anorexia and what current issue related to Anorexia to make One Stop Centre for Anorexic (OSCA) a precise and up to date website. It is crucial to identify functionalities and features of existing Anorexia website in order to make its one of its kind. The fact-finding techniques such as observing potential users will be conducted to ensure what they want the website to be and to have.

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The project does not focus entirely on the research are but also focuses on designing and developing OSCA website. The development will operate under the project schedule and timeline with the aim to complete the project on time. OSCA is will be develop as a website because it will be assessable by entire world. Much preferable language to develop OSCA is by using PHP, HTML and XML. MySQL will be used as database storage medium. The author needs to study and get familiarize with above mechanism tools used in this project.

1.4.2   The Feasibility of the Project

- Technical Feasibility

The decision to develop One Stop Centre for Anorexic (OSCA) is practical since the author is proficient of designing and developing a website. The author is familiar with PHP, HTML and XML language.

- Operational Feasibility

The proposed website is believed to be a website where user can get all information about anorexia and at the same time can interact with dietician. User need to sign up for a personal account that will give access to user to follow the diet and nutrition plan, also user will be applicable to join the forum section.

- Economic Feasibility

This project is cost effective because all the process is computerized. User does not need to buy or install anything to access One Stop Centre for Anorexic (OSCA) since this website is free to be access anywhere under any situation as long as users have an internet connection.

- Schedule Feasibility

This project will be operating under the project timeline and schedule given to ensure the research will be completed during these 14 weeks. Due to this time limit, the author needs to do continuous research to ensure author get as much information as possible.

CHAPTER 2

LITERATURE REVIEW

2.1   INTRODUCTION

The project is about developing a website (One Stop Centre for Anorexic) that focuses to help anorexic overcome their eating disorder. OSCA will become the medium for anorexic and their family members to find information about anorexia nervosa and seeking help from dietician. Anorexic will be able to follow diet and nutrition plan and can join a discussion with dietician in forum section. The author will do several researches and review in order to ensure OSCA will be one of the new innovative website in Malaysia.

2.2   ANOREXIA NERVOSA

According to Otong (2003), Anorexia Nervosa refers to a syndrome manifested by self-induced starvation resulting from fear of fatness rather than from true loss of appetite. Anorexic are refusal to maintain normal body weight which are 85% of ideal weight based on their height and age. Frisch and Frisch (2002) reported that anorexia is a serious medical-psychological condition characterized by a profound disturbance on body image. Anorexic view themselves as undesirably fat even they are not.

According to Royal College of Psychiatrists (2008), usually in teenage years it affects one 15-years old girl in every 150 and one 15-years old boy in every 1000. It shows that anorexia occurs in male as well as in females.

Based on research done by Page (2010), there are five key tools forming the cornerstone of health recovery; meal plan, exercise contract, support groups, cognitive behaviour therapy model and diary. Thus, these tools can be used to help anorexic in overcome their eating disorder.

2.3   INTERNET

Internet has become a new approach in delivering information to the community today. Individual would prefer to search information via internet before asking other people opinion or view. Based on statistic provide by Miniwatts Marketing Group (2009) there are 16,902,600 internet user in Malaysia. Ministry of Health Malaysia (2009) reported that Malaysian population on 2009 is 28,306,700, its shows that three out of four Malaysian populations is using internet in their daily life. Thus, internet could be an efficient tool in health promotion, Treasure, Schmidt and Furth (2003).

2.4   EXISTING ANOREXIA NERVOSA WEBSITE

There are many website that offer information of Anorexia Nervosa, the author chooses two best website. They are

1.   Anorexia Nervosa Treatment (http://www.anorexia-nervosa-treatment.com/)

Figure 2: Homepage of Anorexia Nervosa Treatment

2.   HELPGUIDE.ORG

(http://www.helpguide.org/mental/anorexia_signs_symptoms_causes_treatment.htm)

Figure 3: Homepage of HELPGUIDE.ORG

2.4.1   Design and content

Referring to Anorexia Nervosa Treatment website, they are using same colour of
background and text, which make a little bit harder to user to read the content
especially for user with poor vision. Strong contrast between background and text
will make the text easier to read, Darlington (2005). Example: Black text on white
background will easiest to read like HELPGUIDE.ORG webpage design.
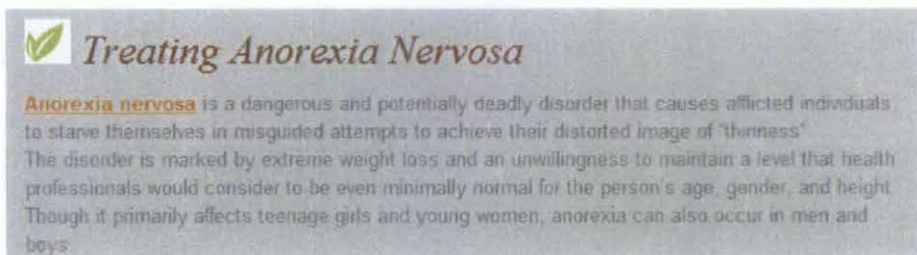
Anorexia Nervosa Treatment:

Figure 4: Screenshot of Anorexia Nervosa Treatment website

HELPGUIDE.ORG:

> **Anorexia is not about weight or food**
>
> Believe it or not, anorexia isn't really about food and weight—at least not at its core. Eating disorders are much more complicated than that. The food and weight-related issues are symptoms of something deeper: things like depression, loneliness, insecurity, pressure to be perfect, or feeling out of control. Things that no amount of dieting or weight loss can cure.

Figure 5: Screenshot of HELPGUIDE.ORG website

User that is looking for Anorexia information at HELPGUIDE.ORG need to scroll down many times in way to catch all information available at these website. According to Hammerich and Harrison (2002) study showed that reading can constantly been interrupted when user need to stop and scroll in way to read the information given. Because when scroll downwards, the last line has not been held in user's working memory that make them need to search which line they stop read before scroll downwards.

According to Hammerich and Harrison (2002), credibility, clarity, conciseness and coherence of content in websites contribute to web ability to persuade a reader that has the right stuff. Credibility is the quality, capability or power to elicit belief is depend on the eye of the beholder. Clarity can be defined as ability to write and exit texts that are clear and easily readable by users. Example like keep paragraphs short and discuss only one topic per paragraph. Next is conciseness, concise means able to present topic in the most economical manner possible, be brief but tough. Last is contents of website must be coherence, by minimizing users cognitive work, all parts of text must be connect together in clear and logical ways.

Table 1: Website content

Content	Anorexia Nervosa Treatment Website	HELPGUIDE.ORG Website
Credibility	Average	Good
Clarity	Average	Average
Conciseness	Average	Good
Coherence	Good	Good

* Based on author view.

2.4.2 Attractiveness of Website

Attractiveness of a websites refers to degree, to which a user believes that the websites is aesthetically pleasing to the eye, Hammerich and Harrison (2002). Basically website that contain graphic rather that only words will be more attractive to user. Both references websites that author choose, content less graphic that will make user feel bored when their reading process. Research made by The Nielsen Company (2002) tells that average surfer on web is more likely to stay in site when it contains some graphic rather than if it does not.

2.4.3 Preferable Website to be used

Based on comparison done above, as a user, author will prefer to use HELPGUIDE.ORG because the content is much more easily to read since authors have poor vision. Additionally, HELPGUIDE.ORG website has ability to control the text size of content.
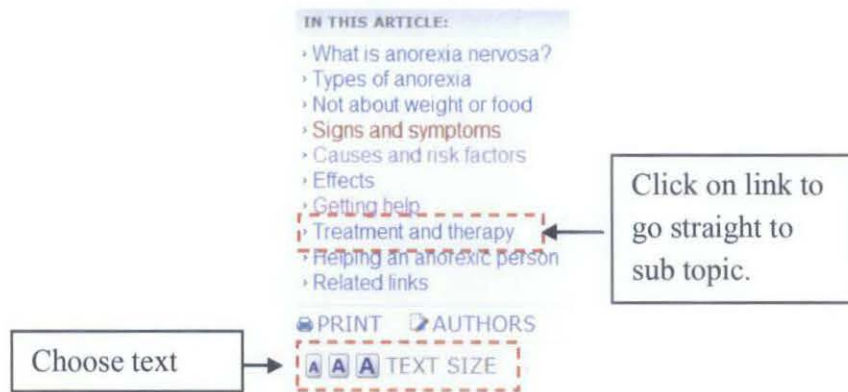

Figure 6: Text size screenshot of HELPGUIDE.com

Even though the user needs to scroll downwards so many times during the reading process but the information content is much more concise. Moreover user can easily click on the link above if they want to go straight to the sub topics. Example, if users want to know about treatment and therapy, he or she can click on link of treatment and therapy and this website will bring the user straight to the treatment and therapy topic.

2.5   PERSUASIVE THEORY

The definition of persuasive communication is any message that intended to shape, reinforce or change the responses of another, or others, Stiff and Mongeau (2003). Usually persuasive theory that been used in health campaigns are Inoculation therapy and Cognitive behaviour therapy. Simons, Morreale, and Gronbeck (2001) define that persuasive communication campaigns as organized sustained attempts to influencing groups or masses of people through a series of message.

Based on Page (2010), one of health recovery key is by using cognitive behaviour therapy. Cognitive behaviour therapy is commonly used to treat a wide range of disorders, including phobias, addiction, depression and anxiety. According to Webber (2010), cognitive therapy is all about learning how our thoughts and emotions will create our behaviours and it also teaches us to stop thinking so negatively, to challenge untrue thoughts and to replace them with more rational and healthy ones.
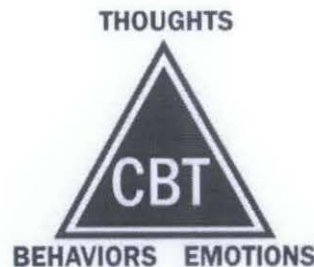
THOUGHTS

BEHAVIORS   EMOTIONS

Figure 7: Cognitive Behaviour Therapy

Anorexic is an individual that obsess in their weight and body image then they set their mind to become as thin as they can and become fear to fat. As a result they deny food and had extreme exercises. In order to change their thoughts, cognitive behaviour therapy is a good therapy to be use inside One Stop Centre for Anorexic.

2.6   FEATURES COMPARISON OF EXISTING WEBSITES

Author chooses three website to compare the features that been provided by the existing Anorexia websites, in order to make OSCA one of its kind. Unfortunately, there are no official website about Anorexia in Malaysia, that make OSCA will be the first Malaysia official website that focus on Anorexia Nervosa.

2.6.1   Anorexia Nervosa Treatment

Features available in Anorexia Nervosa Treatment website is information about anorexia like symptom, treatment and sign. These website also have facts and article column, where user can view latest article about anorexia, refer Figure 8.

Figure 8: Anorexia Nervosa Treatment website

Moreover, Anorexia Nervosa Treatment website also provides chat window, refer Figure 9, where user can chat with online intake counsellor, which will help them find treatment if they are looking for help.
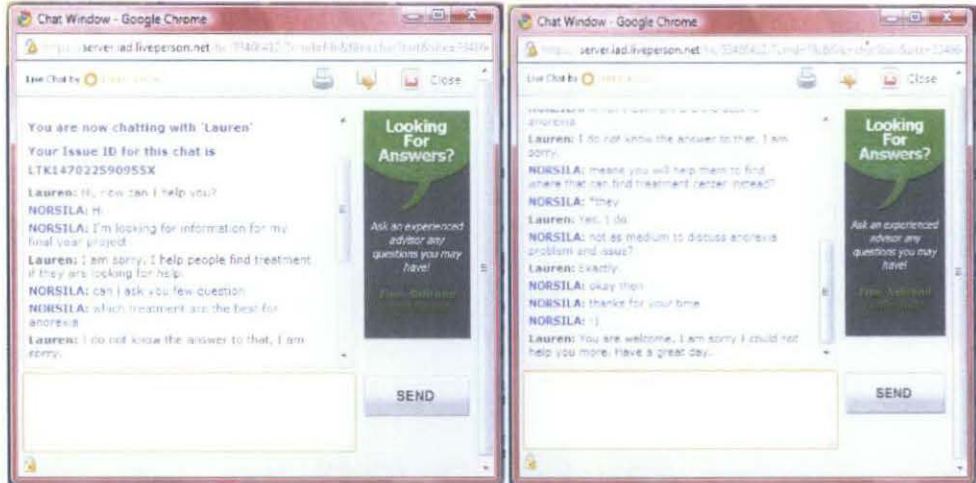
Figure 9: Chat window

2.6.2 Westwind – Eating disorder recovery Centre

Based on Figure 10, Westwind website focus in providing details about treatment program been offered for people that have eating disorder like program components, treatment and daily schedule.
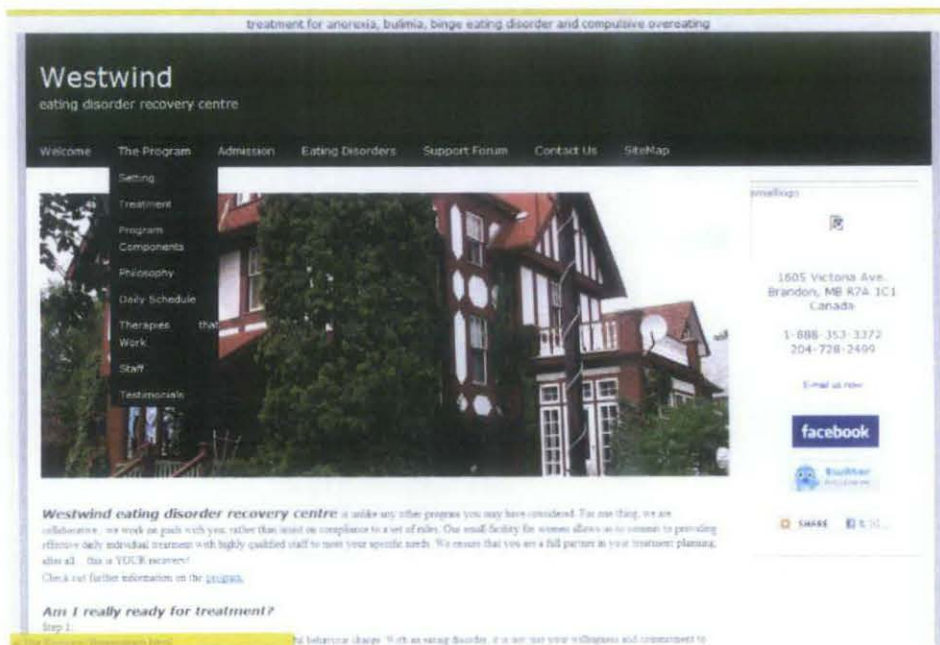

Figure 10: Westwind website

2.6.3   Helpguide.org

Figure 11: Helpguide.org website

Helpguide.org website contains information about anorexia like signs, symptoms, causes and treatment. These website provide search option features, which user can search other related page based on keyword that been provided by user. Helpguide.org also provide text size feature where user can choose text size when they view the website. User can directly go to sub topic they want to view by click on sub topic related under in this article header, Figure 12.

Figure 12: In this article header

CHAPTER 3
METHODOLOGY

3.1   RAPID APPLICATION DEVELOPMENT (RAD) METHODOLOGY.

Rapid application development (RAD) is a development methodology that attempts to address weakness of structured design methodologies; waterfall and parallel development. Since the author has limited time in developing this project, RAD is a best methodology to be used because RAD have ability to adjust system development life cycle (SDLC) phases to get some part of system been develop quickly, Dennis, Wixom and Tegarden (2005). RAD involves iterative development, quick construction of prototypes by using techniques and computer tools such as CASE tools. CASE tools makes tasks are much faster to complete and alter, development information is centralized and information is illustrated through diagram, which typically is easier to understand. Example of CASE tools is functional modelling; activity diagram and use case diagram.
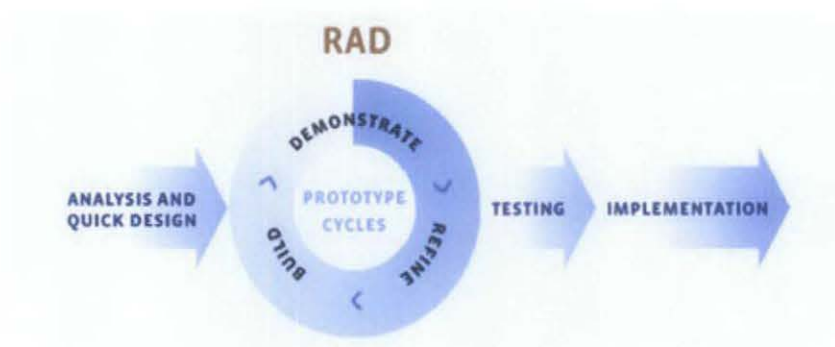
Figure 13: RAD Model

Under prototype cycle, build, demonstrate and refine phase will be performed repeatedly. Usually first prototype will be shown to user who will provide comments, which are used to re-analyze, re-design and re-implement a second prototype that provide a few more features. After the user is satisfied with the prototype, author will move to testing and implementation process.

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3.2 PROJECT ACTIVITIES

3.2.1 Planning

Planning phase is the fundamental process of understanding why should this be build and determining how to build it. First thing to do in planning phase is defined the suitable topic that will be developed. After the topic has been approved, author will move on to gather data related to this topic that will be used in analysis phase. There are several techniques that been used to gather data, there are by reading a books, article and journal, and requirement gathering by using questionnaires and observation techniques. Information about available development tools will be defined during this planning phase.

3.2.2 Analysis

Data that has been collected during planning phase will be analyzed during this analysis phase. From questionnaires, author will come out with requirement determination in order to determine knowledge level of user about anorexia and their expectation. From observation, author will analyze others website content and functionality that will be used in design phase. Which development tools to be used in developing this project also will be finalized.

3.2.3 Design

In design phase, functional modelling like activity diagram and use case diagram will be developed. Activity diagram support the logical modelling of business process and workflows. Use cases are used to describe the basic functions of the information systems. Both diagrams will be used during development phase. During this phase, user interface also will be designed and determined. The content of application will be finalized. The design phase must be carefully developed to ensure this website will meet the requirement mentioned in the analysis phase.

3.2.4 Development and Implementation

Application will be developed based on diagram and user interface that has been designed and determined. Coding will be generated in way to develop the application. After finishing with the development phase, this application will be tested and be delivered as a final product.

3.3 SYSTEM TOOLS

- PHP,HTML and XML
  - Language that been used to develop OSCA.

- phpMyAdmin
  - As MySQL database.

- Microsoft office tools.
  - For documentation purposes.

CHAPTER 4
RESULT AND DISCUSSION

The requirement-gathering process is used for building political support for the author's project and establishing trust and rapport with the users of the systems. It is important to gather all requirements thoroughly using any variety of techniques to make sure the needs for One Stop Centre of Anorexic is well understood before the author moving to design phase. Result gathered from research, survey, observation and feedback will be used to develop an effective and usability prototype.

4.1   QUESTIONNAIRE

Questionnaire is a set of written question for obtaining information from individuals Dennis et al. (2005). Questionnaire participants for the author's project consist of 40 respondents, 14 males and 26 females from age between 20 to 35 years old. From the questionnaire there are several results that has been received; 1) 80% from the respondents have heard about anorexia before. Which means anorexia nervosa is not new to them, mostly respondent have an idea what anorexia is about.
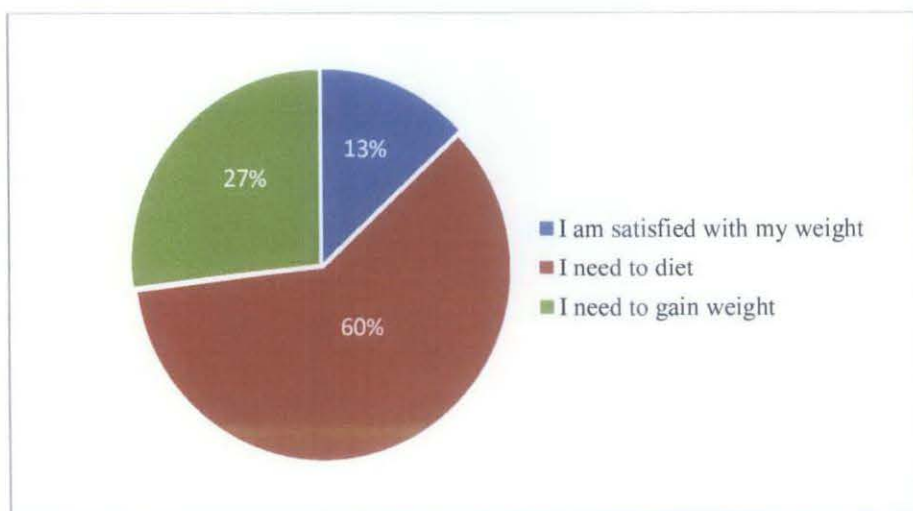
Figure 14: Body image percentage

Figure 14 show that 60% of total respondents think that they need to diet, 48% from them is female and another 12% is male. It is shown that female is more eager to have ideal weight rather than a male. According to Foo (2011), many young girls and

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even boys have fallen victim to anorexia. They strive to be perfect, which in their own skewed reality means to be stick thin and have a highly visible skeletal figure. They starve themselves by obsessing with every single calorie they take in and exercise fanatically without any food to fuel them, despite the fact that they are already underweight as it is and worst will leads them to death.

3) 90% of respondents more prefer to undergo for treatment plan via online which is website. Based on result in Figure 15, it shown that respondents are more prefer to undergo an online treatment rather that private treatment that cost them RM 1,000 per treatment. There are 0% of respondent that choose for government treatment. As a technology era, treatment via online a possible now and from the result, author assume One stop Centre for Anorexic can be a successful website that offer online treatment to help Anorexic in improving their lifestyle.
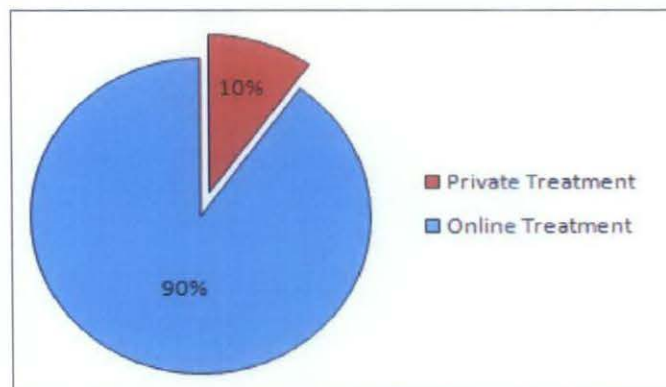
Figure 15: Treatment choices

4.2   OBSERVATION

Observation is the act of watching process being perform, in this context author use observation as a technique to observe existing Anorexia website in order to compare the content and feature available, to ensure One Stop Centre for Anorexic is one of its kind. Author observes three website; Anorexia Nervosa Website, Helpguide.com and Westwind eating disorder recovery Centre. For website comparison details, refer to Chapter 2 section 2.6, Features comparison of existing websites. From the comparison author summarize that below section need to be included in One Stop Centre for Anorexic:

- Home
- Sign and symptoms
- Treatment
- Forum

4.3 FUNCTIONAL MODELLING

Functional model describe business process and the interaction of an information systems with its environment. For this project, two types of models are used to describe the functionality of One Stop Centre for Anorexic: activity diagram and use case diagram. Activity diagram can be viewed as sophisticated data flow diagrams that are used in conjunction with structured analysis. Activity diagram for One Stop Centre for Anorexic refer Figure 16.
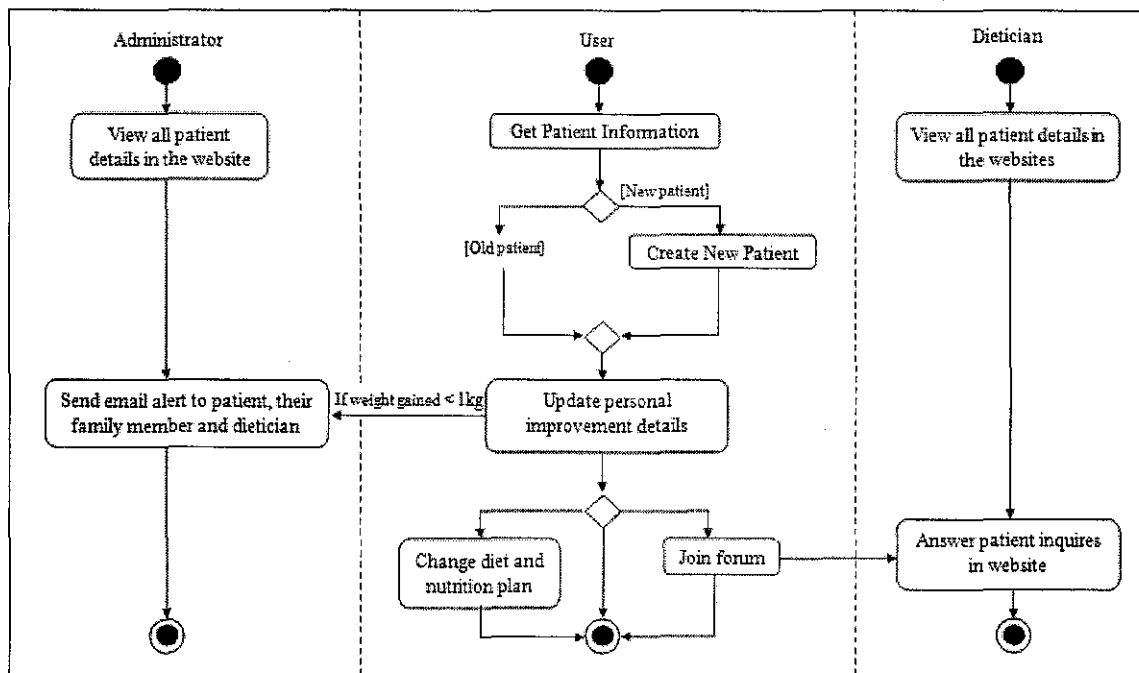
Figure 16: Activity Diagram for One Stop Centre for Anorexic

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Administrator will view all patient information and their progress, if patient gained less than 500 gram for that week administrator will send an email to patient, patient's family member and dietician to alert them that patient progress not meeting the target. New patient need to fill up information details form for administrative purpose and they need to choose their preferable nutrition plan. For the existing patient they need to update their treatment progress once a week. Then they can change their nutrition plan, join forum column if they have anything to share or ask or just end the session. Dietician can view all patient information and communicate with them via forum column. Dietician will privately call the patient, who has low improvement or progress during that week to ensure they follow diet and nutrition plan accordingly.

Use cases are simple descriptions of a system's function from the bird's eye view of the users. Use case will portray the basic functions of the system; what the users can do and how the system should respond to the user's actions. There are three types of actors in One Stop Centre of Anorexic (OSCA):

1. **Administrator:** Can access OSCA and do the following task:

   - Manage Patient include:
     - Delete inactive patient
     - View all patient details in OSCA
     - Send email alert to patient, patient's family and dietician if patient gained less than 500 gram for that week.

   - Control OSCA include:
     - Add new link to other site in the homepage
     - Update the URL and name of link in the homepage
     - Manage and maintain the homepage design and content.

2. **Patient:** Can access OSCA and do the following task:

- Manage account include:
    - Register online in OSCA
    - Join nutrition plan
    - Change diet and nutrition plan
    - Update personal improvement or progress like current weight.
    - Join forum in order to communicate with dietician

3. **Dietician:** Can access OSCA and do the following task:

- Manage patient include:
    - View all patient details in OSCA
    - Communicate with patient via forum column
    - Reply patient inquiries
    - Follow up patient progress and improvement

Refer Figure 17 for OSCA Administrator Use Case:
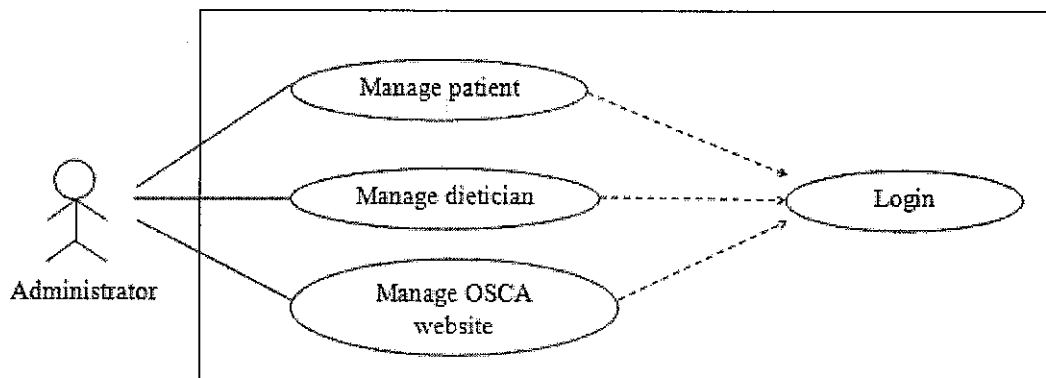
Figure 17: Administrator Use Case

Figure 18 illustrate One Stop Centre for Anorexic Use Case:
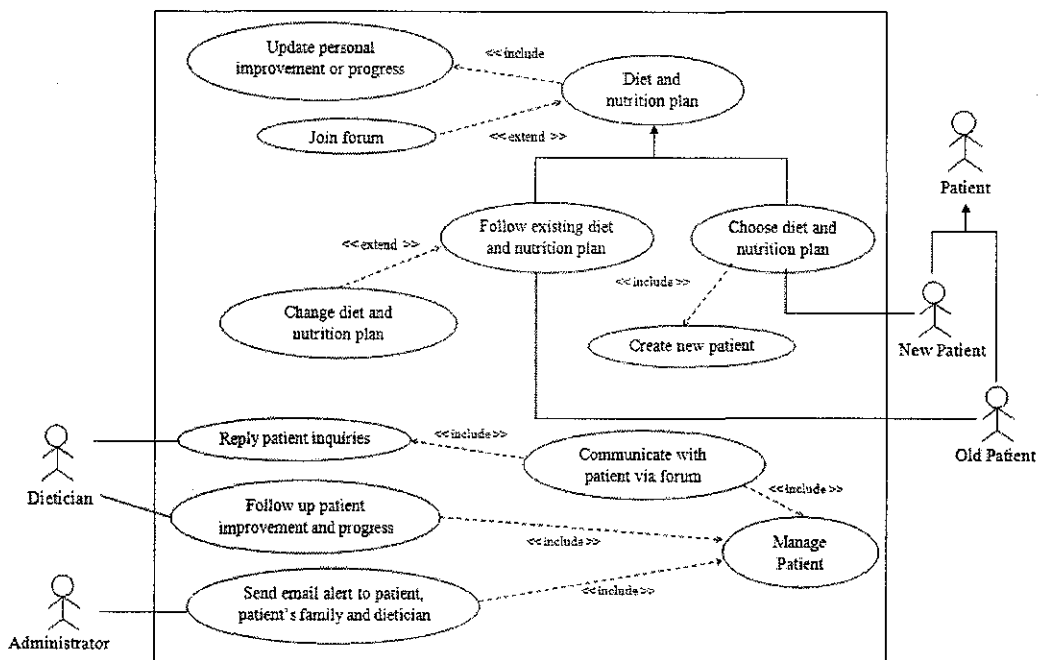
Figure 18: One Stop Centre for Anorexic Use Case

4.4   INTERFACE DESIGN

This section presents the interface design that has been developed for the prototype. This design was the product after caring out the research, questionnaire and observation.

According to Webber (2010), cognitive therapy is all about learning how our thoughts and feelings will create our behaviour. Based on research done by Atkinson (2004), colour can give an impact to individual emotions. From that the author chooses turquoises and pale blues as main colour of One Stop Centre for Anorexic website. Combination of turquoises and pale blues will helps if there is emotional anxiety or hyperactivity, it will make user become calm, cool and it will encourage rest.

At the home page, author includes information about Anorexia nervosa to give a clear picture to the user what Anorexia nervosa is about. Author put You Tube video about My Anorexic Story and anorexic picture at home page with intention to give early awareness to user, which thin is beauty is not really like their think it is actually give negative impact to their life.

There are four sidebars in home page; Home, Sign and Symptoms, Treatment and Forum. In order to join the Treatment and Forum, users need to sign up and login. It is to ensure all discussing topic in forum column is confidential from unauthorized user. It will make user feels more secure to share their thoughts and problem with dietician and among other users.

Figure 19: Home Page

Sign and symptoms page allowed user to check their Body Mass Index (BMI) using Anorexic BMI Calculator. The BMI calculator is not a diagnos that tell user they have Anorexia disorder or not. If user BMI is less than 18.5 kg/m^2, user is under a risk to had this eating disorder. If it so, user can continue read sign and symptoms been provided, then if they have more than one sign and symptoms listed, they are encourge to join the treatment plan and forum column.

Figure 20: Sign and Symptoms Page
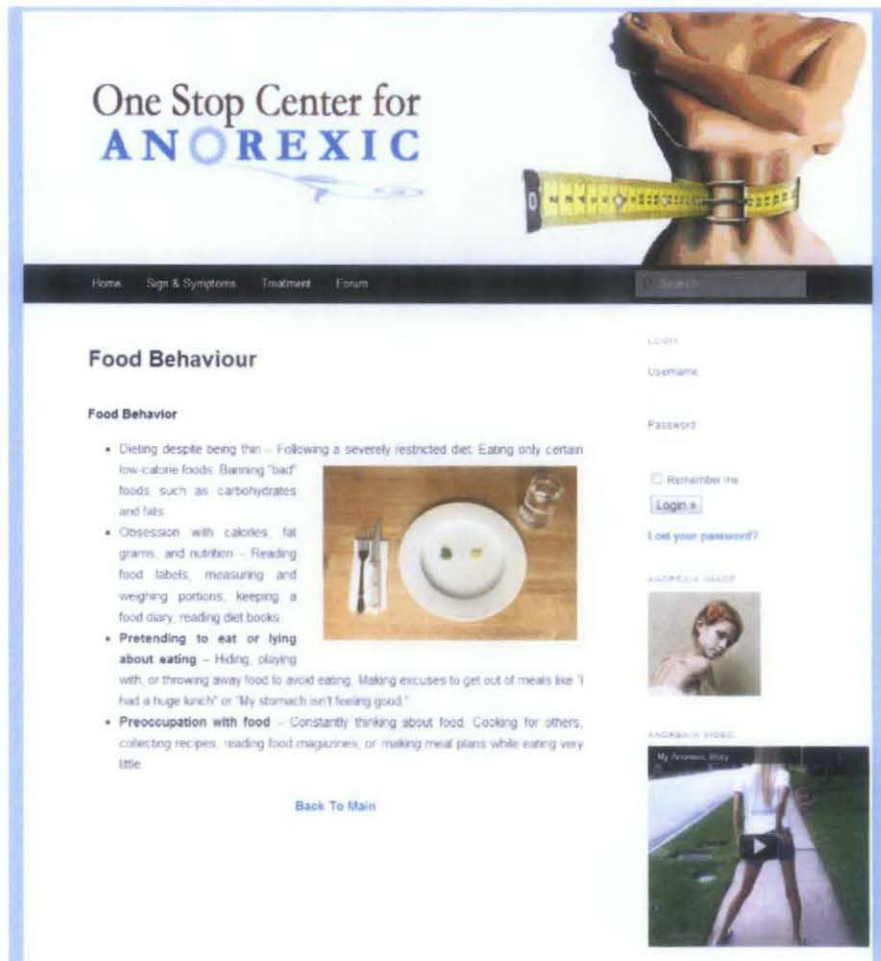
Figure 21: Sign and symptoms for food behaviour

Basically the author used picture and sentence that potientialy will persuade user to join the online treatment and make them to revise back their negative thoughts and change it to more positive thoughts, one of the example is in Figure 22.

Anorexia Nervosa can damage your health and even threaten your life. But you're not alone. There's help available when you're ready to make a change. You deserve to be happy. Treatment will help you feel better and learn to value yourself.

Let's Sign up and join our Treatment Plan and Forum with dietician for free! Change is ahead, but choice is in your hand.

Figure 22: Persuasive method

At Treatment page there will be two sub pages; my nutrition plan and my treatment progress. My nutrition plan contain existing meal plan chosen by user from his last login. According to Page (2010) a meal plan is vitally important in the early days of recovery where weight gain is of greatest need. By having a meal plan it will makes daily meals simple, keeps intake regular so helpful for maintenance and gives free head space that would otherwise be focused on calories. User can simply followed the meal plan they choose rather than think personally what they should take. This situation can make them feel stress; as a result they will stop to take a proper meal because they already tired to think what they should eat at every meal time.
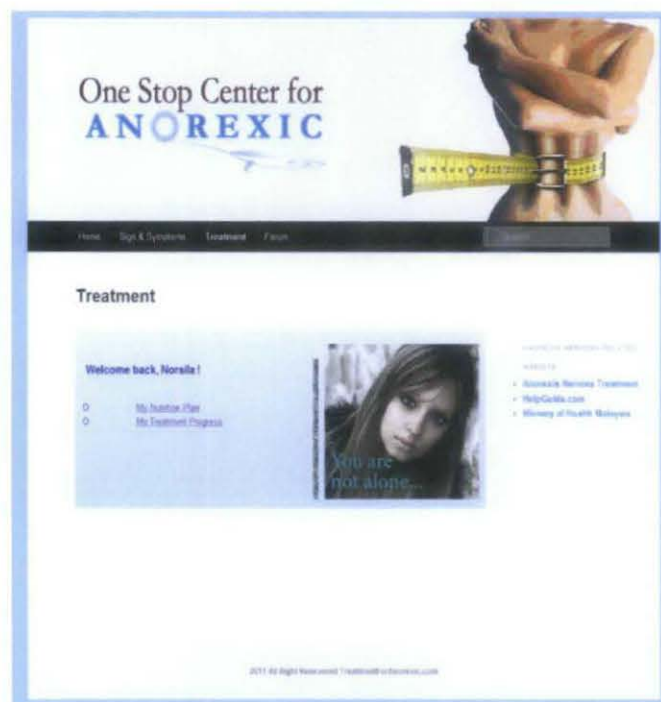

Figure 23: Treatment Page

My treatment progress will act as weekly diary for user. They need to key in their progress and activity once a week like follow the nutrition plan, exercise per week and most important is the weight gained for that week. Administrator and dietician will monitor user weekly progress. If user gained less than 500 gram for that week, administrator will email user, user's family members and dietician to inform that user progress does not meet the treatment target. For user that has good progress continuously they also will get an email from administrator that rewards them with a free voucher, to encourage user to go out, meet people and socialize with them.

Forum is a medium where user can get direct support and share their thoughts, problem and any issue regarding anorexia nervosa with dietician and other registered users. Under Forum, there are 3 sub topic; Anorexia Problem, General Health and Info Centre. Under Info Centre, user can get information about related event happened around them like talk, seminar or any related outdoor activities that they can joined. By joining these outdoor activities anorexic will spend more time in socializing with others so they will have less time to think about their body image and weight.
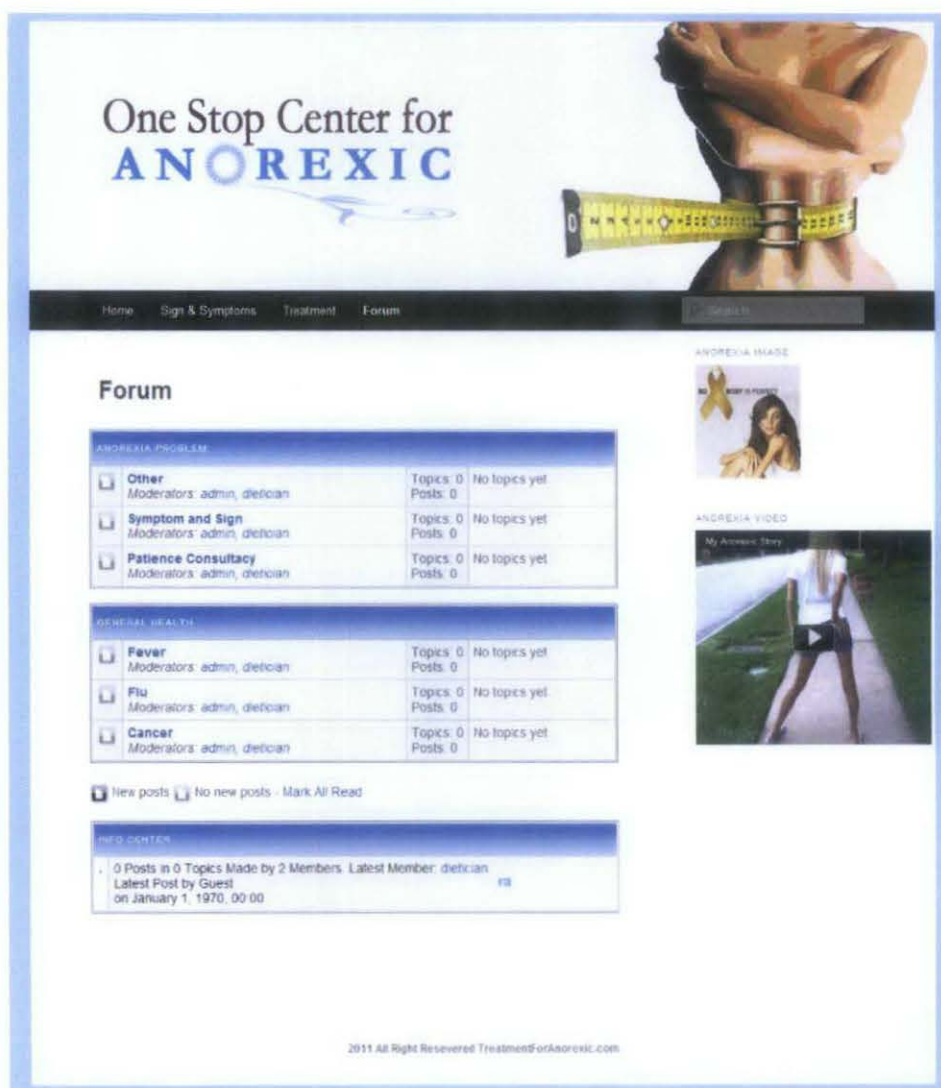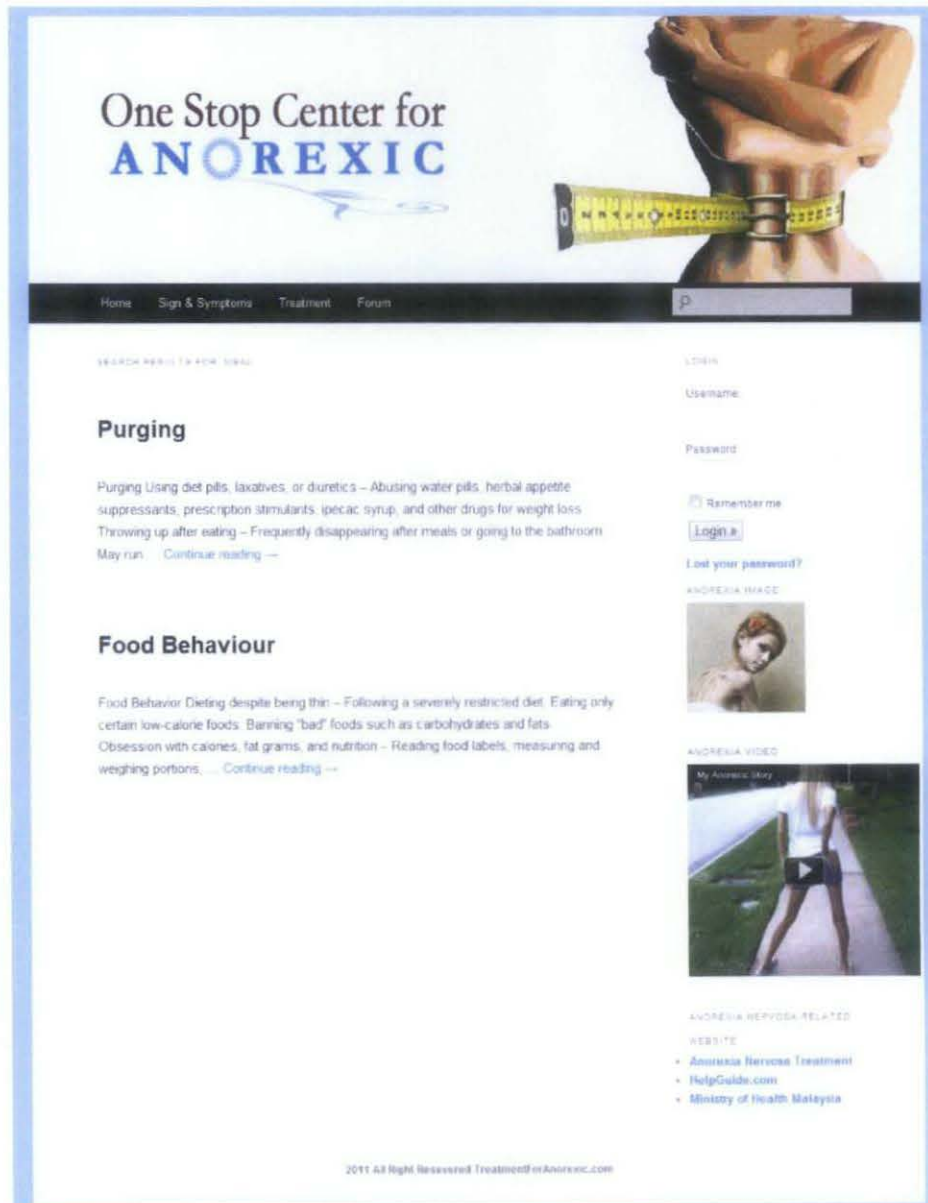

Figure 24: Forum Page

In order to make One Stop Centre for Anorexic is a user friendly website, the author provide search function. User can simply enter keywords in the search box and related result will come out. Example user enters keyword meal and below result will come out:

Figure 25: Search Result

One Stop Centre for Anorexic also provide clear instruction what user need to do when their using this website. Example in Home page, after user finished reading about Anorexia nervosa, mentioned clearly that user can go to Sign and Symptoms page for further information.
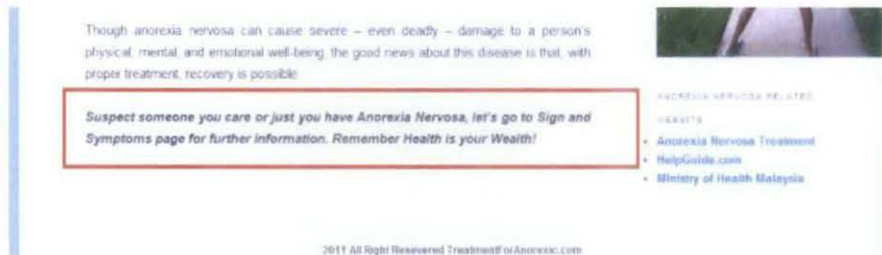
Figure 26: Home page snapshot

Based on research done by Page (2010), there are five key tools forming the cornerstone of health recovery; meal plan, exercise contract, support groups, cognitive behaviour therapy model and diary. One Stop Centre for Anorexic website has covered all the five key tools.

Table 2: Health recovery key tools

Health recovery key tools	One Stop Centre for Anorexic
Meal Plan	Treatment Page
Exercise contract	Treatment Page
Support groups	Forum Page
Cognitive behaviour therapy	Entire website
Diary	Treatment Page

4.5   TESTING

A usability testing was conducted to test the usability of One Stop Centre for Anorexic. Ten students were asked to use the website. These are among the aspect that been tested during the usability testing:

Nine of ten users agreed that this website successfully persuade them to change and try the treatment plan:

Figure 27: Website persuasiveness

In Figure 28, eight users agreed that One Stop Centre of Anorexic is creating awareness about Anorexia nervosa and the importance to change to be a healthier person:
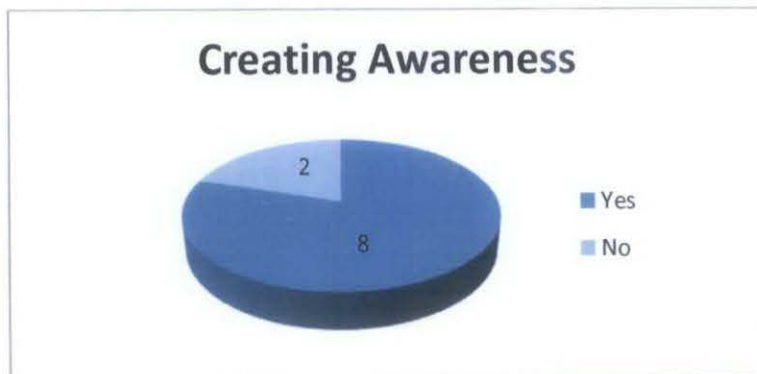
Figure 28: Creating awareness

In Figure 29, four users stated that One Stop Centre for Anorexic is offering an effective treatment plan. Another four user's rate the treatment effectiveness to medium level and the balance rate it as low:

Figure 29: Effective Treatment Plan

Figure 30 shows that this website is easy to use and the instructions are also clear. This is based on the result where there were no users who felt clueless while using One Stop Centre for Anorexic. It shows that the interface is user friendly.

Figure 30: User Friendly

CHAPTER 5

CONCLUSIONS AND RECOMENDATIONS

This project involves development of website that contains information about anorexia nervosa and provides daily services and support to anorexic; nutrition plan and treatment progress update. Cognitive behaviour therapy is been used as a persuasive theory to persuade anorexic overcome their eating disorder. Cognitive behaviour therapy incorporates anorexic thoughts and emotion in order to improve their behaviour to the healthy one.

As a conclusion, One Stop Centre for Anorexic will be a first website in Malaysia that allow anorexic to communicate directly with dietician in forum column also provide online treatment and daily support for anorexic. All the objectives have been met after completing the website and conducting the testing with real users. The website can be maintained by updating the meal plans to different types of food and change the picture or video to the current one since that existing anorexic will stay to the treatment plan for a long time in order to fully recover from anorexia nervosa.

Among the recommendation given for the website is it might be able to send a short message service to anorexic and their family member to remind anorexic about their meal time. Besides, the website could automatically send email to anorexic's family members and dietician if anorexic gained less than 500 gram for that week rather than administrator need to do it manually.

REFERENCES

Books:

[1] Darlington, K. (2005). *Effective Website Development. Tools and Techniques.* Dorset: Pearson.

[2] Dennis, A., Wixom B.H., & Tegarden, D. (2006). *System Analysis and Design with UML version 2.0.* United States of America: Wiley.

[3] Frisch, N. C., & Frisch L. E. (2002). *Second Edition: Psychiatric Mental Health Nursing.* United States of America : Delmar Learning.

[4] Fitzgibbon, M. L., & Stolley, M. R. (2001). *Dying to be thin: Minority women: The untold story.* Retrieved from http://www.pbs.org/wgbh/nova/thin/minorities.html

[5] Glanz, K., Rimer, B.K. & Lewis, F.M. (2002). *Health Behavior and Health Education. Theory, Research and Practice.* San Fransisco: Wiley & Sons.

[6] Hammerich, I., & Harrison, C. (2002). *Developing Online Content.* Unites States of America: Wiley.

[7] Otong, D. A. (2003). *Psychiatric Nursing: Biological & Behavioural Concepts.* United States of America: Delmar Learning.

[8] Simons, H.W., Morreale, J., & Gronbeck, B. (2001). *Persuasion in society.* Thousand Oaks, CA: Sage.

[9] Stiff, J. B., & Mongeau, P. A. (2003). *Persuasive Communication* (2nd ed.). Unites States of America: Guilford.

[10] Treasure, J., Schmidt, U., & Furth E. V. (2003). *Handbook of Eating Disorder* (2nd ed.). Britian: Wiley.

Online Article:

[1] Atkinson, C. (2004). Colour for living and learning. *Resene*. Retrieved on 02 August 2011, from: http://www.resene.co.nz/homeown/use_colr/coloursforliving.htm

[2] Foo, J. (2011, Jan 7). Dying to be thin. *Malaysian Today*. Retrieved 28 February 2011, from: http://www.malaysiantoday.com.my/node/1857

[3] Ng, C. Y. (2007, June 24). Expert: One in 10 young girls are prone to eating disorders. *The Star Online*. Retrieved 1 March 2011, from: http://thestar.com.my/news/story.asp?file=/2007/6/24/nation/17817717&sec=nation.

[4] Page, K.L. (2010, Jan 21). Tools for Anorexia Recovery. *Eating disorder Suite 101*. Retrieved 2 August 2011, from: http://www.suite101.com/content/tools-for-anorexia-recovery-a193308

[5] Steele, M. (2007). The slow suicide. *National statistics for Anorexia with Anorexia charts*. Retrieved 5 April 2011, from: http://www.teen-beauty-tips.com/national-statistics-for-anorexia.html

[6] Webber, C. (2010, July 5). Cognitive therapy and cognitive behaviour therapy. *Diseases and condition*. Retrieved 8 August 2011, from: http://www.netdoctor.co.uk/diseases/ depression/cognitivetherapy_000439.htm

Website:

[1] Eating Disorders. Retrieved 1 March 2011, from http://www.rcpsych.ac.uk/mentalhealthinfoforall/problems/eatingdisorders/eating disorders.aspx

[2] Miniwatts Marketing Group (2009). *Internet world stats*. Retrieved 3 March 2011, from http://www.internetworldstats.com/stats.htm

[3] Anorexia Nervosa Survey. *FYP Survey*. Retrieved on 5 April 2011, from http://www.surveymonkey.com/s/LPLZK9C

[4] Anorexia Nervosa Website. Retrieved 1 March 2011, from http://www.anorexia-nervosa-treatment.com

[5] Helpguide.com. *Anorexia Nervosa*. Retrieved 1 March 2011, from
http://www.helpguide.org/mental/anorexia_signs_symptoms_causes_treatment.htm

[6] Westwind eating disorder recovery Centre. Retrieved 8 March 2011, from
http://www.westwind.mb.ca

Task Name	Jan 4	Feb 1	Feb 2	Feb 3	Feb 4	Mar 1	Mar 2	Mar 3	Mar 4	Apr 1	Apr 2	Apr 3	Apr 4	May 1	May 2	May 3	May 4	Jun 1	Jun 2	Jun 3	Jun 4	Jul 1	Jul 2	Jul 3	Jul 4	Aug 1	Aug 2	Aug 3	Aug 4
FYP 1																													
Selection of project topic and supervisor	■	■																											
Submission of proposal			■																										
Planning Phase				■	■	■	■																						
Project Initization				■																									
Gathering Data : Research on topic and tools					■	■																							
Submission of extended proposal						■																							
Gathering Data: Interview and questionnaires							■	■																					
Proposal Defense								■																					
Analysis Phase										■	■	■	■																
Analyze data collected										■	■																		
Finalized development tools											■																		
Submission of interim report												■																	
Requirement gathering												■																	
FYP 2																													
Design Phase																		■	■	■									
Design Strategy																		■											
Design Functional Modelling																			■	■									
Design User interface																				■									
Development and Implementation phase																						■	■	■	■	■	■	■	■
System construction																						■	■						
Coding and website development																							■	■					
System integration																									■				
Pre - EDX																										■			
Dissertation																											■		
VIVA																												■	
Final dissertation and Technical Report																													■

Note: The May column (May 1–4) is marked "Study and Examination week".

Appendix B: Questionnaire

1. Gender

   o Male

   o Female

2. Have you heard about Anorexia Nervosa before?

   o Yes

   o No

3. Are you satisfied with your body weight?

   o Yes. Sure

   o I need to diet

   o I need to gain weight

4. Preferable way of treatment?

   o Go to Government Hospital which is time consuming

   o Go to Private Hospital that will cost you RM 1000 per treatment

   o Follow treatment plan via online (Website)