CHAPTER 1

INTRODUCTION

1.1 Project Background

In this digital era, the rapid development of computer technology has encouraged its widespread use and utilization in various fields, including medicine and health. Computers, which were originally only used for data processing and mathematical calculations, can now be utilized as a provider of solutions to inputed problems (Muniar, n.d.). Through out its development, computers have various functions, one of which is its ability to act like an expert or specialist. The application of expert systems in the field of medicine or health can involve disease diagnosis and providing solution recommendations based on the available diagnosis results (Kirman et al., 2019).

Expert systems have significantly contributed to the field of medicine. Instead of depending solely on medical professionals, advanced diagnostic systems have emerged to diagnose diseases and provide expert guidance to patients. These diagnostic tools are utilized in medical facilities and clinics, with some being available as open-source resources for broader accessibility. The purpose of expert diagnostic systems is not to replace doctors but to support them in achieving quicker and more accurate diagnoses. They can also be particularly beneficial for patients residing in regions with limited and costly access to healthcare services. (Azeez et al., 2019).

Eating disorders are mental health conditions that have significant psychological and medical implications. Conditions like anorexia nervosa (AN) and bulimia nervosa (BN) are enduring illnesses characterized by disruptions in eating patterns or difficulties in weight management. The Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV), categorizes three forms of eating disorders: anorexia nervosa (AN), bulimia nervosa (BN), and binge-eating disorder (BED). AN is characterized by a refusal to maintain a normal weight, distorted body image, extreme fear of becoming fat, and highly disturbed eating behavior. BN is

characterized by eating large amounts of food often and repeatedly, then trying to vomit it back up, using laxatives, fasting, or excessive exercise (Krisnani et al., 2018). Examples of common eating disorders include extreme dieting, overeating or binge eating, fasting, calorie counting, and self-induced vomiting.

Over the last five decades, there has been a global rise in the number of individuals affected by eating disorders. Particularly since the 1980s, there has been a noticeable uptick in the prevalence of eating disorders within the Asian population. More recently, there has been a surge in the occurrence of eating disorders among young women in Singapore. In Singapore, the prevalence of young women at risk of developing eating disorders stands at a significant 7.4%. In 2007, a Singaporean media outlet highlighted a six-fold increase in teenagers grappling with eating disorders since 2002. Singapore General Hospital records indicate approximately 140 cases of eating disorders annually, yet only 10 to 20% of individuals seek treatment for these conditions. 0.05% of psychiatric patients in Malaysia had been diagnosed with AN, and this figure did not increase for 15 years (Krisnani et al., 2018). In Indonesia, 12-22% of women aged 15-29 suffer from chronic energy deficiency (BMI <18.5) in some areas (Atmarita, 2005). Surprisingly, Indonesia ranks 4th in the world below the USA, India, and China (Chairani, 2018).

In Indonesia, There haven't been many studies regarding eating disorders resulting from deviant eating behavior as it is still considered a trivial issue and not many cases have been revealed. In a quantitative study on the tendency of deviant eating behavior among teenagers in Jakarta, it was stated that 34.8% of teenagers in Jakarta experience deviant eating behavior, with 11.6% suffering from anorexia nervosa and 27% suffering from bulimia nervosa (Melani et al., 2021). However, it is difficult to know the exact statistics of the incidence of this disorder in Indonesia. Whether this deficiency is caused by eating disorders or other things is not explained in detail. However, there is still a lack of research on eating disorders in Indonesia, so its prevalence is not known for certain.

Given the problems outlined, I am interested in solving these issues by utilizing information technology, namely designing an expert system to diagnose unusual behavior of multiple categories of eating disorder patients using the certainty factor method and based on the web. With this system, it can make it easier for

people to know the symptoms and types of eating disorders without having to meet a doctor directly, and can also know the solution to prevent the occurrence of eating disorders.

1.2 Problem Statement

1. Many people with eating disorders difficulties in obtaining accurate diagnoses.
2. There was no preparation which resulted in the absence of appropriate treatment records.
3. Some people find it difficult to track their own progress effectively.

1.3 Objective of the Project

1. To create an expert system that can be used to diagnose eating disorders.
2. To suggest the treatment based on eating disorder category.
3. To provide tracking on the improvement based on acitivity by the user.

1.4 Significance of the Project

Contribution to understanding eating disorders : This project has significant theoretical impact as it will contribute to our understanding of eating disorders, particularly among the Generation Z. Eating disorders are a mental health issue that is becoming increasingly relevant in modern society, and this project will help identify unusual behaviors related to it.

Early detection and intervention: The expert system can aid in the early detection of eating disorders in Generasi Z individuals. Early intervention is crucial for successful treatment outcomes and preventing the progression of these disorders, which can have severe physical and mental health consequences.

Improving diagnostic effects: This expert system can be used as an aid for mental health professionals in diagnosing eating disorders, allowing them to focus more on other aspects of patient care.

Increasing access to care: With this system, individuals who may not have direct access to professionals, also can gain initial insights into their condition and seek further help if needed.

Fulfilling public health service needs: This project will help meet the needs of public health services by providing an expert system for diagnosing eating disorders. It can also accelerate better medical responses and more efficient handling.

1.5 Scope of the Project

1.5.1 User Scope

- User are required to register first
- User can login to existing account
- User can manage their profile
- User can answer the questionnaire set
- User can view result after they answer the questionnaire
- User can view treatment
- User can view detection history

1.5.2 System Scope

- **Eating disorder classification**: This project will include the development of an expert system that can identify and analyze various types of eating disorders, including anorexia nervosa, bulimia nervosa, binge eating disorder, and other eating disorders that may exist among the Generation Z.
- **Questionnaire Set**: Based on the answers given in the questionnaire set, the expert system can analyse and determine a possible diagnosis.
- **Diagnosis Result**: The system will provide diagnostic results to the user based on the symptoms or information that has been inputted.
- **History of Diagnosis**: The diagnosis history can be used to monitor the user's progress. By looking at the previous history, users can see if any changes have occurred, as well as compare them with the current examination results.
- **Treatment Recommendations**: The system will provide appropriate treatment recommendations based on the given diagnosis. These recommendations may include psychological therapy, family support, and changes in eating patterns.
- **Patient Information Collection**: The system will allow users to input patient information, including observed symptoms, behaviors, and risk factors. This information will be used as a basis for diagnosing patients.

1.6 Assumptions and Limitations

In the context of the "Development of Expert System for Diagnosing Unusual Behaviour of Multiple Categories of Eating Disorder Patients in Gen Z Using Certainty Factor Method" project, several key assumption and limitations are recognized, which frame the project's scope and potential constraints:

1.6.1 Assumptions

- **Patient Data Availability**: The assumption is that patient data with eating disorders among Generation Z is available and accessible for the purpose of this research. This data includes information about eating behavior, medical history, and eating disorder-related data.
- **Patient Compliance:** The assumption is that patients will provide accurate and honest information about their eating disorder-related behavior. Patient compliance in providing relevant information is important for accurate diagnosis.
- **Successful Clinical Implementation**: The assumption is that the developed expert system can be effectively implemented in clinical settings and provide benefits in diagnosing eating disorders in patients.
- **Inability to Distinguish from Other Diseases**: The assumption is that the expert system will be able to distinguish eating disorder symptoms from other diseases that have similar symptoms.
- **Data Security and Privacy:** The assumption is that patient data security and privacy will be well maintained in accordance with ethical and legal guidelines applicable to this research.

1.6.2 Limitations

- **Limited Medical Knowledge:** This expert system depends on the medical knowledge available at the time of development. Limitations in certain medical understanding or research may affect the accuracy and comprehensiveness of the diagnosis.
- **Eating Disorder Category Changes and Additions:** Over time, there may be changes or additions to the medically recognized classifications of eating disorders. The system may not automatically be able to accommodate these changes without manual updates.

- **Depends on Accurate Input Data:** The accuracy of the system in diagnosing depends on the accuracy and completeness of the data entered by the user or mental health professional. Inaccurate or incomplete data may affect the diagnosis results.