



UNIVERSITI PUTRA MALAYSIA

***EATING DISORDER FACTORS AMONG FEMALE SCHOOL-GOING
ADOLESCENTS IN JEDDAH, SAUDI ARABIA***

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ADOLESCENTS IN JEDDAH, SAUDI ARABIA**

By

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**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia in
Fulfilment of the Requirements for the Degree of Master of Science**

February 2022

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

EATING DISORDER FACTORS AMONG FEMALE SCHOOL-GOING ADOLESCENTS IN JEDDAH, SAUDI ARABIA

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February 2022

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Background: Eating disorders are characterized by an abnormal attitude towards food that causes someone to change their eating habits and behaviour. People with an eating disorder may focus excessively on their weight and shape, leading them to make unhealthy choices about food with damaging results to their health, emotions, and ability to function in important areas of life. This study aimed to investigate the prevalence of eating disorders and its associated factors among female going-school adolescents in Jeddah, Saudi Arabia. Methods: A cross-sectional study was conducted in five schools in Jeddah, Saudi Arabia, among 554 female adolescent students from age 13 to age 18. Students with physical and psychological disabilities, were excluded from this study. A stratified random sampling technique and proportional stratified sampling technique (PSS) were used to select the participants. Data was collected via an online self-administered questionnaire including Eating Attitudes Test-26 (EAT-26), socio-cultural Attitudes Toward Appearance Questionnaire (SATAQ-4) and Eating Behaviours and Physical Activity Questionnaire from June to July 2021. Results: This study included 502 female school-going students with a response rate of 90.6%. Their median age was 16 (IQR 2, range 13-18 years). Most of the participations were Saudi (90.8%). Most fathers (44.2%) have undergraduate degrees or higher education levels, while most mothers (38.4%) have high school education levels. Among the participants, 47.8% have a moderate household monthly income (5000-14999 Saudi Riyal). Most of the participants (65.1%) were from secondary grade, and the prevalence of eating disorders was 53.6% (n=269). Their median (IQR) EAT-26 score for participants was 21 (IQR 22). Around 45% of the participants had family influences, 36.7% had peer influences, and 49.4% had media influences on their appearance and body shape. Family influences and food habits were significantly associated with the eating disorders ($p<0.05$). Conclusion: this study established that more than 50 % of female school-going students were found to have eating disorders. The high prevalence of eating disorders among schoolgirls in Jeddah, Saudi Arabia, is of great concern. In order to mitigate these problems, effective programs must be designed to change dietary habits while considering the effects of

family, peer and media influence, as well as focusing on the importance of breakfast and practicing physical activity



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FAKTOR GANGGUAN PEMAKANAN DALAM KALANGAN REMAJA BERSEKOLAH PEREMPUAN DI JEDDAH, ARAB SAUDI

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Latar belakang: Gangguan pemakanan dicirikan oleh sikap tak normal terhadap makanan yang menyebabkan seseorang mengubah tabiat dan tingkah laku pemakanan mereka. Individu yang mengalami gangguan pemakanan mungkin terlalu memfokuskan berat dan bentuk badan mereka yang mengakibatkan mereka membuat pilihan yang tidak sihat mengenai makanan yang memudaratkan kesihatan mereka. Gangguan pemakanan merupakan kondisi yang serius berkaitan dengan tingkah laku pemakanan persisten yang secara negatif memberi kesan terhadap kesihatan, emosi, dan keupayaan seseorang untuk berfungsi dalam ranah kehidupan yang penting. Kajian ini bertujuan untuk meneliti prevalens gangguan pemakanan dan faktor berkaitan dengan gangguan pemakanan dalam kalangan remaja bersekolah perempuan di Jeddah, Arab Saudi. Kaedah: kajian keratan rentas telah dijalankan di lima buah sekolah di Jeddah, Arab Saudi. Selepas memperoleh semua kebenaran yang diperlukan bagi menjalankan kajian dan mendapatkan persetujuan daripada pelajar dan ibu bapa mereka sebelum terlibat dalam kajian ini. Sesi atas talian telah dijalankan ketika pengumpulan data bagi menerangkan tujuan kajian. Satu set soal selidik swatadbir telah diedarkan kepada responden dari Jun hingga Julai 2021. Data telah dianalisis menggunakan SPSS versi 26. Statistik deskriptif telah digunakan untuk memaparkan data bagi menentukan min, median, sisihan lazim (SD) (pemboleh ubah berterusan), kekerapan dan peratusan bagi mempersembahkan data kategorikal (pemboleh ubah kategorikal). Ujian khi kuasa dua dan ujian Tepat Fisher telah digunakan untuk menentukan perkaitan antara pemboleh ubah kajian. Regresi logistik Binari telah digunakan untuk menentukan prediktor gangguan pemakanan. Dapatan: kajian ini merangkumi 502 pelajar bersekolah perempuan. Umur mereka berjalat antara 13 hingga 18 tahun, dengan keseluruhan umur median (IQR) ialah 16 (2). Kebanyakan partisipan ialah Saudi (90.8%). Kebanyakan bapa (44.2%) mempunyai ijazah prasiswazah atau tahap pendidikan tinggi, manakala kebanyakan ibu (38.4%) mempunyai tahap pendidikan sekolah tinggi. Dalam kalangan partisipan, 47.8% mempunyai pendapatan bulanan sederhana (5000-14999 Saudi Riyal). Kebanyakan partisipan (65.1%) adalah dari gred menengah. Median (IQR) skor EAT-26 bagi partisipan ialah 21 (22). Kebanyakan 269 (53.6%) daripada remaja perempuan

memperoleh skor 20 atau ke atas, yang merupakan titik pemisah EAT-26, menunjukkan gangguan pemakanan. Sekitar 45% partisipan mendapat pengaruh keluarga, 36.7% mendapat pengaruh rakan sebaya, dan 49.4% mendapat pengaruh media ke atas rupa dan bentuk badan mereka. Pengaruh keluarga dan tabiat makanan adalah secara signifikan berkaitan dengan gangguan pemakanan ($p < 0.05$). Kesimpulan: kajian ini memperjelaskan bahawa lebih daripada 50 % pelajar bersekolah perempuan didapati mempunyai gangguan pemakanan. Prevalens gangguan pemakanan yang tinggi dalam kalangan pelajar sekolah perempuan di Jeddah, Arab Saudi merupakan kepedulian utama. Bagi mengurangi masalah tersebut, program tingkah laku pemakanan efektif yang direka bentuk bagi mengubah tabiat dietari dan penegasan akan kepentingan pola pemakanan yang sihat serta akibat gangguan pemakanan remaja adalah perlu.

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LIST OF ABBREVIATIONS

ED	Eating Disorder
WHO	World Health Organization
AN	Norexia Nervosa
BN	Bulimia Nervosa
UPM	Universiti Putra Malaysia
SD	Standard deviation
IQR	Interquartile range
OR	An odds ratio
SPSS	Statistical Package for the Social Sciences
EAT-26	Eating Attitude Test
SATAQ-4	Socio-cultural Attitudes Toward Appearance Questionnaire
NND	Not normaly distributed
%	Percentage
e.g.	For example
X ²	Chi-square
SR	Saudi Riyal

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Eating disorders are considered when people undergo severe disturbances in their eating behaviours and associated perceptions and feeling (Hay, 2020). Typically, people with eating disorders get concerned mainly with food and their body weight (Hay, 2020). The effects of eating disorders are not always immediate but can appear years after recovery (Hay et al., 2017).

In the 1300s, eating disorders became more prevalent, and a book was published about a young woman who starved herself due to religious reasons (Brumberg, 1989). Eating disorders were hard to detect; doctors did not realise it was psychological and emotional until the 1930s. Basic eating disorders began to increase around the 1970s and 1980s. Other disorders, such as binge eating disorders, were discovered in the 1990s. Several historical events have traditionally been blamed for the rise in eating disorders. This is because the female body ideal became thinner throughout the twentieth century, particularly in the 1960s (Brumberg, 1989). According to Kazdin et al. (2017), 30 million people suffer from eating disorders, ultimately ending in chronic sickness or death.

Eating disorders have massive effects on the cardiovascular, gastrointestinal, neurological, and endocrine systems. Lack of proper nutrition causes the body to feed on its tissue, breaking down muscle, including the heart (Health Consequences, 2018). Eating disorders cause low blood pressure and put a person at risk for heart failure. Low blood pressure can lead to the brain not getting enough blood, causing fainting or dizziness. Lack of proper nutrition can cause a deficit in fat, which is necessary to create a protective layer of lipids around the brain. Without this protective layer, tingling and numbness in the fingers, hands, and feet can occur (Plichta & Jezewska-Zychowicz, 2020).

Eating disorders also negatively impact the digestive system, causing blood sugar fluctuations, nausea, blocked intestines, and various bacterial infections. If continued for a long time, the intestines can stop working, so even after recovery digesting solid food would be a challenge. Fat and cholesterol are needed to produce sex hormones. Lack of these sex hormones hinders the beginning of menstruation and causes it to be irregular or completely stopped (Johnson et al., 2002; Izydorczyk & Sitnik-Warchulska, 2018; Schmitt et al., 2021). Eating disorders also cause bone loss, putting a person at a higher risk for broken bones and fractures. A meta-analysis of 36 studies found that a ratio of 5.9 of mortality rate with a follow-up duration of 12.8 years among those with eating disorders (Arcelus et al., 2011).

Anorexia nervosa (AN) is one of the many types of eating disorders. Anorexia nervosa is characterized by abnormally low body weight, excessive fear of excess weight, and a skewed weight interpretation. Anorexia is typically associated with diet, but it is more of a way to cope with mental issues. Often, people who suffer from anorexia relate their weight to their worth (Schlegl et al., 2020; Wonderlich et al., 2020).

Bulimia nervosa (BN) is another eating disorder in which someone eats large amounts of food, but to restrict weight gain, they vomit or purge, excessively exercise or use laxatives (Nakano, 2001; Stice et al., 2021). They usually have harsh feelings toward their body shape, and to deal with these emotions, they purge in the hope of undoing any damage to their figure. Orthorexia is made of Greek words in which ortho, which means good or correct and anorexia, means appetite. A person who has orthorexia intensely focuses on eating healthy to where it blocks out other life means (Stice et al., 2021).

Eating disorders, particularly anorexia nervosa and bulimia nervosa, have been significant problems in the care of adolescents and even children (Stice et al., 2021). These complex disorders are believed to arise from the interaction of multiple risk factors. Previous studies have found that several factors are associated with eating disorders behaviour among adolescents, such as environmental, behavioural, and psychological factors (Leme et al., 2020; Krueger & Osler, 2020). Marks et al. (2020) stated that eating disorders and body dissatisfaction among young women escalate as media attention and higher-resource lifestyles expand in limited-resource settings. Media exposure is one potential risk leading to the growth of eating disorders, particularly in adolescents, which are more susceptible to images conveyed by mass media that generate an unhealthy body image (Brown & Tiggemann, 2021). Media exposure is likely to be a significant risk factor. The study found that social appearance anxiety partly mediated the association between low self-confidence, eating-disorder risk, and body esteem among female adolescents (Brown & Tiggemann, 2021).

In addition, intellectual ability mediated the impact of body esteem on eating-disorder risk and adolescent social appearance (Micali, 2015). Chin et al. (2020) revealed that higher prevalence is seen in female college students with eating disorder symptoms and body image disappointment. Hence it is important to reduce the onset of mental health and behavioural disorders in the future to treat this subset of the population concerning these issues.

There are many psychological and physiological changes that occur during adolescence (Kadriu et al., 2014). It is well known that adolescents are particularly vulnerable to nutritional problems because of their lifestyles and eating habits (Latzer et al., 2014). Adolescent girls are reported to be overweight and obese (Musaiger et al., 2016). These rapid changes, combined with rapid socio-cultural changes, put them at risk for developing eating disorders, such as anorexia nervosa, bulimia nervosa, frequent dieting, binge eating, and partial syndrome (Latzer et al., 2014; Mousa et al., 2010).

There are several characteristics of eating disorders, such as chronicity, relapse, and disordered eating behaviour, in which a person's attitudes toward weight and body shape are distorted, in addition to their perceptions of their own body shape. This complex illness negatively impacts the physical and mental health of adolescents and is associated with significant morbidity. In addition, among all mental disorders, eating disorders have the highest mortality rate (Quick et al., 2013).

At one time, eating disorders were believed to occur mostly in affluent Western countries (Abdollahi & Mann, 2001; Chang et al., 2015; Nasser, 1986). However, according to epidemiological data, eating disorders have increased dramatically worldwide in the past two decades, and they affect people from all ethnic, cultural and socioeconomic backgrounds. Girls and young women aged 15 to 24 are most vulnerable to eating disorders (Cummins et al., 2005; Grigg et al., 1996; Szabo & Hollands, 1997).

Ritchie & Roser (2018) states that 16 million people have an eating disorder globally; women are more likely to encounter an eating disorder than men. Eating disorders lead to be more common among adolescents. Statistics on lifespan prevalence indicate that about 0.5% of girls and 0.1% of boys would meet anorexia requirements over their lifespan (Keski-Rahkonen et al., 2007).

The prevalence of eating disorders in the Arab world has been increasing. In the Arab world, 13–55% are at high risk for eating disorders; the prevalence was higher among females than males, and the prevalence increased during adolescence (Melisse et al., 2020). Studies reported that Western socio-cultural influences might have catalyzed the eagerness toward body thinness and muscularity in the East, increasing body dissatisfaction and unhealthy eating behaviours in adolescents (Rauof et al., 2015; Melisse et al., 2020; Izydorczyk et al., 2020; Marks et al., 2020; Brown, & Tiggemann, 2021). In Jordan, 33% had eating disorders among adolescents girls (Mousa et al., 2010). In a systematic review study, the prevalence of eating disorders was varied from 11.5% in Egypt, 49.1% in the UAE, 36.6% in Saudi Arabia, and 36.4% in Oman in adolescents of Arab countries. The highest prevalence was reported in UAE and Saudi adolescents (Galmiche et al., 2019).

In the last few decades, rapid cross-cultural social changes have occurred in many Arabian countries, and the attitudes and behaviours of the new generation have borrowed Western values (Amir, 2015; Bas et al., 2004; Fath et al., 2012; Latzer et al., 2014). The attitudes and behaviours of the new generation in many Arab countries have been influenced by Western values over the last few decades (Amir, 2015; Bas et al., 2004; Fath et al., 2012; Latzer et al., 2014). Despite this, the majority of Arab populations have traditionally viewed plumpness as a sign of beauty, fertility, and health (Abdollahi & Mann, 2001). As a result, adolescent girls are experiencing an increasing conflict between Western values and Arabic customs. This cultural clash between traditional values and adopting Western values in harmony is a source of conflict in Arab populations, which increases the risk of eating disorders (Latzer et al., 2014). Nonclinical studies have recently confirmed a high prevalence of abnormal eating attitudes and behaviours among adolescents in several Arab countries (Fath et al., 2012; Haleama,

2016; Kazim, 2017; Rafia Bano, 2013). As disordered eating attitudes can become eating disorders with potentially severe consequences during adolescent growth and development stages, early identification is essential to reduce the complications of eating disorders (Souza et al., 2005).

The number of studies conducted in Arab countries, particularly Saudi Arabia, is small, despite the high prevalence of disordered eating attitudes (between 15.9% and 49.1%) (Al-Subaie, 1998; Rafia Bano, 2013; Fallatah, 2015; Galmiche et al., 2019). Therefore, The present study was conducted in Jeddah city, Saudi Arabia, taking the seriousness of the problem on the one hand and the lack of knowledge of eating behaviour on the other.

1.2 Problem Statement

Eating disorders have harmful effects on health, and they are more common among female adolescents. Research suggests that females are more concerned with body perfectionism in terms of weight and height, resulting in eating disorders (Ata et al., 2006). Thus (Galmiche et al., 2019), females worldwide exhibit higher rates of disordered eating. Furthermore, the high rates of disordered eating are increasing. During the study period, the prevalence of eating disorders among females increased, from 3.5% in 2000–2006 to 7.8% in 2013–2018, an alarming issue for public health and healthcare providers. Eating disorders are highly prevalent in adolescents, affecting from 6% to 8% of the populations examined in several studies. These results are understudies reporting the early onset of eating disorders, especially anorexia nervosa (AN) and bulimia nervosa (BN). In support of this, Tuffa et al. (2020) state that the lifetime prevalence of eating disorders is 2.7%.

A study conducted by Musaiger et al. (2013) assessed the extent of eating disorders among adolescents in seven Arab countries, namely Algeria, Jordan, Kuwait, Libya, Palestine, Syria, and Emirates reported that females were twice as likely to have disordered eating attitudes than males. The risk of disordered eating attitudes in obese adolescents was two to three times higher than that in non-obese adolescents across both genders. In addition, eating disorders were more than twice as prevalent among female adolescents (20.9%) than among men adolescents (9.3%). The prevalence rose modestly with age (Fatima et al., 2020). Efforts to address the problem of eating disorders are consistently targeted at females. Moreover, in their study, Tuffa et al. (2020) found that in an urban setting, there are substantial rates of unhealthy dietary behaviour among young females. To address this rising public health challenge, researchers and policymakers must concentrate their efforts and build relevant strategies.

Eating disorders have serious short and long-term consequences that can affect adolescents' physical and psychological wellbeing. Adolescents with eating disorders may experience pubertal delays, growth retardation and/or bone mineral acquisition impairments (Nussbaum, 1985). Eating disorders can also cause further physical conditions, such as seizures and diabetes (Alasiri, 2017). According to Alharbi et al. (2018), There are immediate physical effects as the body struggles to function without

the nutrients and fuel that it needs. The sufferer is also at risk of developing long-term, potentially life-threatening health problems, particularly if the condition has been untreated for many years.

The development of eating disorders is complex, and no single factor can explain it. It has been reported that sociodemographic characteristics, body weight status and psychological, socio-cultural and behavioural factors are associated with eating disorders (Aish et al., 2018; Alfarisi et al., 2006; Gan et al., 2018; Yasser et al., 2009). Early findings have reported that socio-economic factors are associated with eating disorders among female adolescents (Aish et al., 2018; Alfarisi et al., 2006). Furthermore, Gan et al. (2018) reported that psychological factors, including depression and body image, are associated with eating disorders among female adolescents.

However, there is still a lack of studies investigating the combination of socio-economic, environmental, psychological, and behavioural factors on eating disorders in Saudi Arabia. Most of the study that has been done in Saudi Arabia focused on the prevalence of eating disorders and sociodemographic factors (Allihaibi et al., 2015; Bano et al., 2013; Fallatah et al., 2015; Fatima et al., 2015; Fatima et al., 2018). A study has been done in Jeddah, a city in Saudi Arabia, reported the highest rate of Eating Disorder (ED) among underweight students (32.9%). In contrast, the lowest rate was reported among obese students (7.1%) and no significant association between sociodemographic characteristics (Allihaibi et al., 2015). Other studies were representing Saudi adolescent students in different cities, including Hail and Makkah, found that eating disorders were 36% and 26.1%, respectively (Bano et al., 2013; Allihaibi, 2015). A cross-sectional survey design in which 314 adolescent's females (age: 15-19 years) were selected from 4 schools of Arar city, Saudi Arabia, found a 25.47% prevalence of eating disorders (Fatima et al., 2015). Another study found that 26.66% of female college students had a prevalence of eating disorders (Fatima et al., 2018). Therefore, there is a need to conduct a study on eating disorders that investigate the factors associated with eating disorders among female adolescents in Saudi Arabia.

1.3 Significance of Study

Based on previous studies, eating disorders are a significant health concern in Arab countries, where a high prevalence of eating disorders was ranged between 13% to 50%, especially among the adolescent population (Waseem & Ahmad, 2018; Melisse et al., 2020). A range of risk factors related to eating disorders exposes the adolescent population to impact their health negatively, such as weight loss, gastrointestinal complaints, fatigue, hair loss and dehydration (Solmi et al., 2020). Moreover, the high prevalence of complications (39%) was detected among eating disorders people results in high morbidity (27%) and mortality rates (5.6% per year) (Hoek, 2006). Thus, continuity of uncontrolled risk factors exposes the high-risk adolescent populations to the risk of eating disorders and complications.

At present, although there have been many studies of eating disorders among adolescents, risk factors associated with eating disorders have not been well recorded among female adolescents in Saudi Arabia. Thus, this study will provide baseline information about the prevalence and associated factors of eating disorders among female adolescents in Jeddah, Saudi Arabia, for future research or intervention programs targeting the Saudi community. In addition, this study provides information to the health and education authorities of the current statuses. It may recommend suitable solutions in favour of prevention and control of eating disorders among female adolescents to improve the health of the adolescents.

1.4 Research Questions

1. What is the prevalence of eating disorders among female school-going adolescents in Jeddah, Saudi Arabia?
2. What are the socio-economic, socio-cultural, and behavioural factors (frequency of food consumption, eating habits and physical activity) among female school-going adolescents in Jeddah, Saudi Arabia?
3. Is there a significant association between eating disorders with the socio-economic, socio-cultural, and behavioural factors (eating habits and physical activity) among female school-going adolescents in Jeddah, Saudi Arabia?
4. What are the predictors of the eating disorders among female school-going adolescents in Jeddah, Saudi Arabia?

1.5 Objectives

1.5.1 General Objective

The study aims to investigate the prevalence of eating disorders and the factors associated with eating disorders among public-school female adolescents in Jeddah, Saudi Arabia.

1.5.2 Specific Objectives

The objectives of the study are:

- a) To estimate the prevalence of eating disorders among female school-going adolescents in Jeddah, Saudi Arabia.

- b) To determine the socio-economic, socio-cultural, and behavioural factors (frequency of food consumption, eating habits and physical activity) among female school-going adolescents in Jeddah, Saudi Arabia.
- c) To determine the association between eating disorders with the socio-economic, socio-cultural, and behavioural factors (eating habits and physical activity) among female school-going adolescents in Jeddah, Saudi Arabia.
- d) To determine the predictors of the eating disorders among female school-going adolescents in Jeddah, Saudi Arabia.

1.6 Research Hypothesis

- H1. There is a significant association between the socio-economic factors with eating disorders among female school-going adolescents in Jeddah, Saudi Arabia.
- H2. There is a significant association between the socio-cultural factors with eating disorders among female school-going adolescents in Jeddah, Saudi Arabia.
- H3. There is a significant association between behavioural factors (eating habits and physical activity) and eating disorders among female school-going adolescents in Jeddah, Saudi Arabia.
- H4. There are predictors of the eating disorders among female school-going adolescents in Jeddah, Saudi Arabia.

1.7 Conceptual Framework

Figure 1.1 shows the conceptual framework for the association of risk factors with eating disorders among female school-going adolescents in Jeddah, Saudi Arabia. The study was intended to investigate the prevalence of eating disorders and the factors associated with eating disorders among public-school female adolescents in Jeddah, Saudi Arabia. The dependent variable in this study is eating disorders. The independent variables in this study are categorized into four sections, including socio-economic, socio-cultural, behavioural, and psychological factors. The dependent variable is in the black box, while independent variables are indicated in green boxes. In addition, the arrows signify the association between the dependent/outcome and the independent/explanatory variables. However, although psychological factors are an important component, they were not studied. This framework was developed based on relevant literature reviews on eating disorders and associated factors among adolescents (Allihaibi et al., 2015; Fatima et al., 2018).

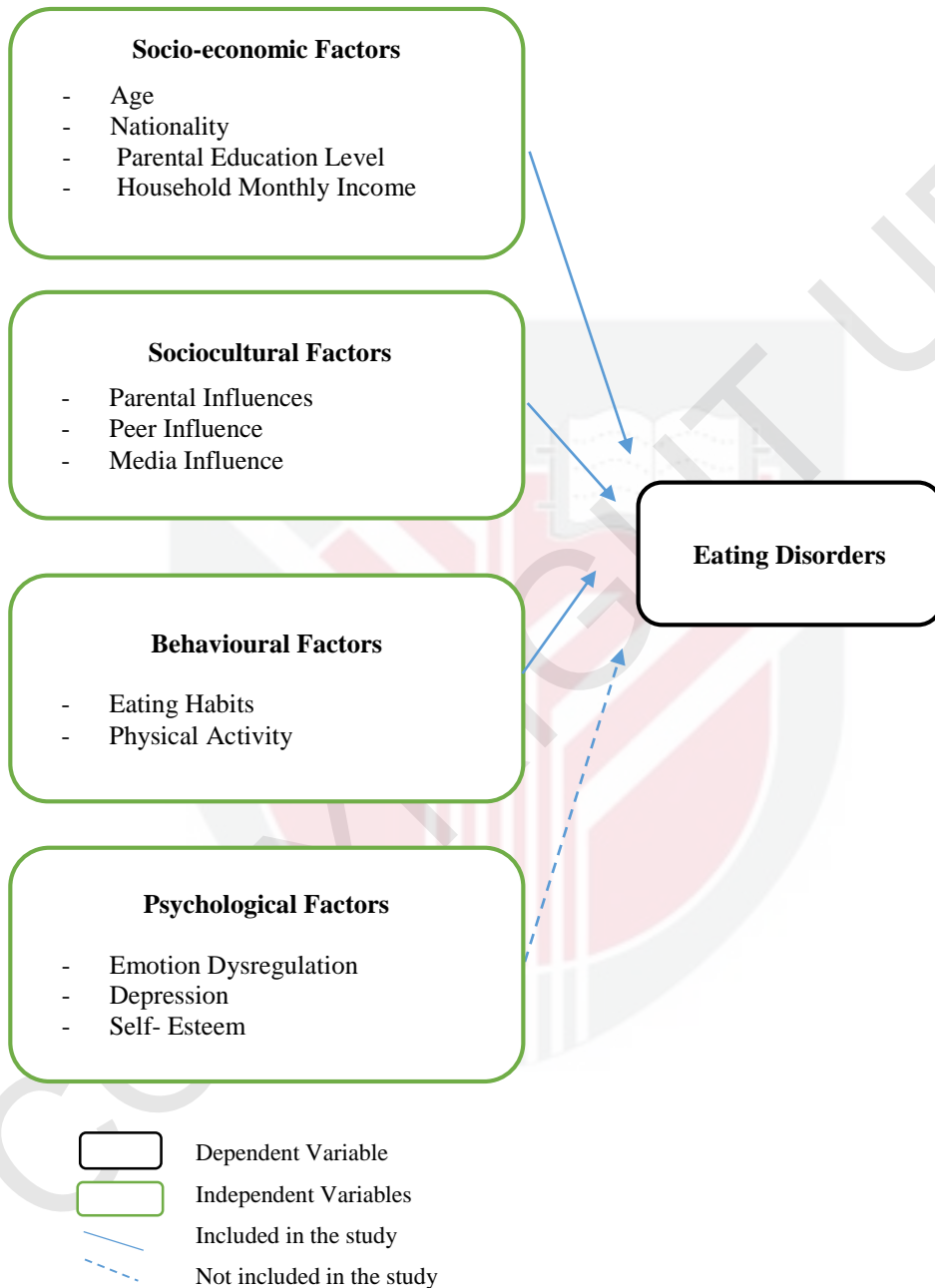


Figure 1.1: Conceptual Framework

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