ISSN Print: 2664-8962
ISSN Online: 2664-8970
Impact Factor: RJIF 5.44
IJPR 2025; 7(1): 47-57
www.psychiatryjournal.in
Received: 02-01-2025
Accepted: 05-02-2025

Ahmed Saad
Assistant Professor of Psychiatric and Mental Health Nursing, Al-Rayan Private Colleges, College of Health Sciences and Nursing, Al-Madinah Al-Munawarah, Saudi Arabia

Marwa Samy Elsaieed Elsheikh
Assistant Professor of Psychiatric and Mental Health Nursing, Al-Rayan Private Colleges, College of Health Sciences and Nursing, Al-Madinah Al-Munawarah, Saudi Arabia

Zeinab Mohammed Aysha
Assistant Professor, Critical Care & Emergency Nursing, Al-Rayan Private Colleges, College of Health Sciences and Nursing, Al-Madinah Al-Munawarah, Saudi Arabia

Abeer M Mohamed
Assistant Professor of Clinical Pathology and Clinical Chemistry, Al-Rayan Private Colleges, College of Health Sciences and Nursing, Al-Madinah Al-Munawarah, Saudi Arabia

Corresponding Author:
Ahmed Saad
Assistant Professor of Psychiatric and Mental Health Nursing, Al-Rayan Private Colleges, College of Health Sciences and Nursing, Al-Madinah Al-Munawarah, Saudi Arabia

Anorexia nervosa among Egyptian adolescence girls: The intersection of eating disorders and body image concern

Ahmed Saad, Marwa Samy Elsaieed Elsheikh, Zeinab Mohammed Aysha and Abeer M Mohamed

DOI: https://www.doi.org/10.33545/26648962.2025.v7.i1a.85

Abstract
Anorexia nervosa is a significant concern among adolescent girls, particularly in Egypt, where societal pressures and body image concerns play a crucial role in its development. This study explores the relationship between body image perceptions and the severity of eating disorders among this demographic, providing insights into a region that has been underrepresented in global research.
Methods: Design: A descriptive quantitative multicenter cross-sectional design was employed. Setting: The study was conducted in public schools across urban and rural areas in Egypt. Subjects: A convenient sample of 200 adolescent girls aged 12-18 years, diagnosed with anorexia nervosa, was included. Tools: Data collection was performed using a self-administered questionnaire developed based on recent literature, the Eating Disorder Inventory-3 (EDI-3), and the Body Shape Questionnaire (BSQ). The reliability of the tools was confirmed with Cronbach's Alpha coefficients of 0.901 for eating disorder measures and 0.862 for body image.
Results: The findings revealed that 58.5% of participants experienced moderate eating disorders, while 27% had severe and 14% had mild forms. Additionally, 44.5% showed moderate concern with body image, 29% experienced severe concern, and 16% had mild concern. Significant correlations were found between body image concern and eating disorder severity.
Conclusion: The high prevalence of moderate to severe eating disorders and body image concerns among adolescent girls in Egypt highlights the urgent need for targeted interventions. More than half of the participants experience moderate levels of eating disorders, with over one-quarter suffering from severe forms. According to concerns about body image, half of the girls exhibit moderate concern, more than one quarter experience severe concern.

Keywords: Anorexia nervosa, adolescent girls, body image, eating disorders, Egypt, cross-sectional study

Introduction
The adolescent phase is a crucial period of development, marked by significant physiological, psychological, and emotional changes (Vieira & Branco, 2023) [37]. During this stage, the emergence of eating disorders among teenagers can have severe and long-lasting consequences for their physical and mental well-being (Kjeldbjerg & Clausen, 2023) [22]. These disorders have become increasingly prevalent in recent decades and are now considered the third most common chronic condition among adolescent females (Zhang *et al.*, 2023).
Eating disorders are complex and multifactorial conditions that affect both physical and mental health and can be life-threatening. They are characterized by an excessive preoccupation with body weight and shape or a significant distortion of body image, accompanied by voluntary food restriction or episodes of binge eating that cause considerable distress and impair health and quality of life (Golden *et al.*, 2022; Milic *et al.*, 2022) [20, 24].
These disorders, including anorexia nervosa (AN), bulimia nervosa, and binge eating disorder (BED), are particularly associated with Western countries (Cella *et al.*, 2022) [6]. Among these, anorexia nervosa stands out due to its peak onset during adolescence and its status as the psychiatric illness with the highest mortality rate (Donato *et al.*, 2022) [13]. AN is often comorbid with other physical and mental health problems,

yet there is inconsistent training and working knowledge among clinicians dealing with underweight adolescents (Alnaher *et al.*, 2024) [1]. Globally, the lifetime prevalence of AN is reported to be approximately 0.91%, with females being the most vulnerable. The average age of onset is between 17 and 22 years. The global burden of AN has been rising, with the age-standardized disability-adjusted life-years (DALY) increasing from 8.5 per 100,000 in 1990 to 9.5 in 2017 (Safiri *et al.*, 2022) [30]. According to the DSM-V, anorexia nervosa is defined as a disorder predominantly occurring in adolescents and young adults, characterized by persistent weight loss due to permanently restricted calorie intake, leading to a significant reduction in body weight relative to age, sex, developmental stage, and physical health (Rossi *et al.*, 2023; Stern, 2023; Brown & Levinson, 2022) [4, 23, 29, 35].

Additionally, AN is marked by an intense fear of gaining weight, a distorted perception of body weight or shape, and a failure to recognize the seriousness of the current low body weight. The average age at onset is 17 years (Stice *et al.*, 2022; Gardner *et al.*, 2022) [18]. Understanding the specific characteristics of adolescents and the developmental process of adolescence is crucial when defining the diagnosis, course of treatment, or outcome of eating disorders (Filipponi *et al.*, 2022).

Adolescent eating disorders can arise due to various risk factors, including societal, psychological, and biological variables. Hormonal changes during puberty may influence body image concerns and increase the risk of developing an eating disorder (Gkintoni *et al.*, 2024) [18]. Psychological factors such as low self-esteem, perfectionism, and body dissatisfaction, along with social factors like peer pressure, media influence, and societal pressure to be thin, may encourage harmful eating habits (Breton *et al.*, 2022) [2].

Chronic illnesses like eating disorders significantly affect family life and psychosocial functioning, often leading to low self-esteem, social isolation, anxiety, and depression (Simic *et al.*, 2022) [33]. Adolescents with AN are best managed by a multidisciplinary team (MDT) providing collaborative medical, nutritional, and psychological interventions (Salvatelli, 2023) [32]. This approach typically involves the family, dieticians, psychiatrists, psychologists, occupational therapists, nurses, and pediatricians (Fahs, 2023) [15]. The integration of physical and mental health is recognized as a key priority for improving health care, with anorexia nervosa exemplifying the need for such an approach (Yager, 2024) [39].

This study provides a comprehensive examination of anorexia nervosa among adolescent girls in Egypt, a demographic and geographic focus that has been underrepresented in global research. The findings will offer valuable insights into the intersection of eating disorders and body image concerns within this specific cultural context. By addressing these issues, the study will help fill the knowledge gap and contribute to the development of culturally sensitive intervention strategies.

Furthermore, the research aims to inform healthcare providers, policymakers, and educators about the unique challenges faced by adolescent girls in Egypt concerning anorexia nervosa. This knowledge can guide the creation of targeted prevention and treatment programs, ultimately improving the mental and physical health outcomes for this vulnerable population.

Methods

Aim: The aim of this study is to explore the intricate relationship between body image perceptions and the development and severity of eating disorders, specifically anorexia nervosa, among adolescent girls.

Research Questions

What is the level of eating disorder and body image concern among adolescent girls?

What is the relationship between body image dissatisfaction and the severity of anorexia nervosa symptoms in adolescent girls?

Study Design

A descriptive, quantitative, multicenter cross-sectional design involves a systematic collection, analysis, and interpretation of data to give a clear picture of a particular situation, which was carried out at public preparatory and secondary females' schools from urban and rural areas in Al-Gharbiya governorate, Egypt.

Sampling and recruitment

A convenient sample of 200 adolescent girls from previous mentioned setting. To conduct this study, inclusion criteria were established, which included: age 12 - 18 years, suffered from Anorexia Nervosa at any category, and agree to participate in the study.

The data was collected at the end of the academic year during the school day. We send invitations to 230 adolescent girls, while thirty participants (13%) refused to participate in the study, so final subjects was 200 adolescents

Sample Size Formula:

The sample size nnn for a descriptive study is calculated using the formula: (Daniel, 1999) [12].

$$\frac{Z^2 \times P \times (1-P)}{E^2}$$

Given Data

- Z = 1.96 (for a 95% confidence level)
- P = 0.5 (assuming 50% prevalence)
- E = 0.05 (5% margin of error)

Data Collection Procedures and Study Instrument

Tool I: A self-administered questionnaire was prepared and developed by the researcher in the Arabic language after reviewing recent and relevant literature (Choukas-Bradley *et al.*, 2022; Ciao *et al.*, 2022 and Coelho *et al.*, 2022) [7, 8, 9]. It consists of the following parts:

Part 1: Characteristics of Studied Adolescent Girls with Anorexia Nervosa: Age, education level, residence, Weight, height, BMI to assess the physical state of patients, particularly underweight conditions common in anorexia nervosa.

Part 2: Family and Medical History of Studied Adolescent Girls with Anorexia Nervosa:

History of eating disorders in family, Describe the eating habits in your family growing up, Supportive is your family regarding your eating disorder and recovery, engage in regular physical activity, Have any dietary restrictions,

History of mental health disorder at family and there any significant stressors in your current environment (e.g., family conflict, academic pressure):

Tool II: Eating Disorder Inventory-3 (EDI-3)

The Eating Disorder Inventory-3 (EDI-3) is a widely used self-report questionnaire designed to assess a range of psychological traits and behavioral symptoms associated with eating disorders, particularly anorexia nervosa and bulimia nervosa. Developed as an update to its predecessors, the EDI-3 includes 91 items distributed across 12 subscales that measure specific aspects of eating disorder pathology and associated psychological conditions (Engel *et al.*, 2006) [14].

The EDI-3 subscales include Drive for Thinness, Bulimia, Body Dissatisfaction, Low Self-Esteem, Personal Alienation, Interpersonal Insecurity, Interpersonal Alienation, Interoceptive Deficits, Emotional Dysregulation, Perfectionism, Asceticism, and Maturity Fears. Each item is rated on a three-point Likert scale ranging from "Always 3", sometimes 2, "Never 1," with higher scores indicating greater severity or frequency of the symptom being assessed. The EDI-3 also provides composite scores that summarize broader domains of psychological functioning, such as Eating Disorder Risk and General Psychological Maladjustment.

Scoring

For each subscale, there are established cut-off points that help in identifying clinically significant levels of psychological distress or symptomatology. These cut-off points vary depending on the population and clinical setting, but a general guide is provided below:

- Drive for Thinness: > 14 (out of a possible 21) indicates significant preoccupation with dieting, fear of weight gain, and body image concerns.
- Bulimia: > 16 (out of a possible 24) suggests frequent binge eating and purging behaviors.
- Body Dissatisfaction: > 18 (out of a possible 27) reflects significant dissatisfaction with body shape and size.
- Low Self-Esteem: > 12 (out of a possible 18) indicates pervasive feelings of inadequacy and low self-worth.
- Personal Alienation: > 14 (out of a possible 21) points to a sense of loneliness and emotional emptiness.
- Interpersonal Insecurity: > 14 (out of a possible 21) suggests a fear of social interactions and relationships.
- Interpersonal Alienation: > 14 (out of a possible 21) indicates feelings of estrangement from others.
- Interoceptive Deficits: > 20 (out of a possible 30) suggests difficulty in recognizing and responding to bodily and emotional cues.
- Emotional Dysregulation: > 16 (out of a possible 24) reflects poorly controlled and intense emotional experiences.
- Perfectionism: > 12 (out of a possible 18) indicates an excessive drive for perfection and unrealistic personal standards.
- Asceticism: > 14 (out of a possible 21) suggests a tendency toward self-denial and disciplined self-control.
- Maturity Fears: > 16 (out of a possible 24) indicates fear or avoidance of adult responsibilities and roles.

Total scoring systems categorized into (Mild 91 - 135, Moderate 136 - 190, Severe 191 - 273)

Tool III: Body Shape Questionnaire (BSQ): The Body Shape Questionnaire (BSQ) is a widely used self-report measure designed to assess concerns related to body shape and the level of body image distortion in individuals, particularly those with eating disorders such as anorexia nervosa. The BSQ was developed by Cooper *et al.* (1987) [10] and consists of 34 items that focus on the respondent's experience of body dissatisfaction and their preoccupation with weight and body shape (Cooper *et al.*, 1987) [10].

Structure and Scoring

- **Items:** The BSQ contains 34 items that are rated on a six-point Likert scale ranging from "Never" to "Always." The items ask about feelings and behaviors related to body shape over the past four weeks.
- **Scoring:** Scores are summed to produce a total score, with higher scores indicating greater concern about body shape and more significant body image distortion. Typically, a total score above 110 is considered to indicate a high level of concern with body shape, which is often associated with eating disorders. Total 34 to 204.

The Body Shape Questionnaire (BSQ) uses cut-off points to categorize the severity of body shape concerns, which are particularly useful in clinical settings to identify individuals at risk for or suffering from eating disorders such as anorexia nervosa.

BSQ Cut-off Points

- **Less than 80:** No Concern - Scores below 80 suggest that the individual has little to no concern about body shape, which is considered within the normal range.
- **80 to 110:** Mild Concern - Scores in this range indicate mild body shape concerns. Individuals may have some preoccupation with body shape, but it is not typically severe enough to warrant clinical attention.
- **111 to 140:** Moderate Concern - This range suggests moderate concern with body shape. Individuals may experience noticeable distress and preoccupation with their body shape, which may impact their daily functioning.
- **141 or above:** Severe Concern - Scores above 140 indicate severe body shape concerns. This level of concern is often associated with significant distress and dysfunction, commonly seen in individuals with eating disorders like anorexia nervosa.

Procedure

After securing official permissions from the designated public shools that mentioned previously, the fieldwork was conducted over two months, from April 2024 to June, 2024. The researchers first introduced themselves to the adolescent girls, explaining the study's purpose, objectives, and content to gain their cooperation. They assured the subjects that their responses would remain anonymous and that the data would be used exclusively for scientific research, maintaining strict confidentiality.

A pilot study involved 20 adolescent girls (10% of the total sample size) to test the clarity, applicability, relevance, and feasibility of the tools and to determine the time for data collection. After analyzing the pilot study's results, the necessary modifications were made. Finally, the girls involved in the pilot study were included from the study sample later.

Data collection occurred twice a week, on Sunday and Monday, at the specified settings until the required sample

size was achieved. Each participant underwent a 20-minute individual interview using the adolescent girls' body image and eating disorder.

Validity & Reliability

The researcher ensured that the questionnaire content and the alignment of the questions addressed the aims, objectives, and research questions of this study. The questionnaire was guided by a comprehensive literature review and assessed for content validity by a panel of five experts who evaluated its representativeness for the target construct. The reliability of the tool was measured through Cronbach's Alpha test, yielding the following results: Body Image ($\alpha = 0.862$), and Eating disorder ($\alpha = 0.901$).

Ethical Consideration

This study was performed in accordance with the principles of the Helsinki Declaration. The relevant guidelines and regulations. Ethical approval to conduct the research was obtained from the Research Ethical Committee at the Faculty of Nursing, Tanta University, Egypt. All subjects were given adequate information about the study's purpose and objectives as well as its benefits. Written informed consent was obtained from each adlosecent girls. The researchers emphasized that girls' participation in the study was voluntary, and there was a possibility to withdraw at any time without repercussions. Confidentiality was also ensured by coding the data.

Statistical analysis

The data were analyzed using SPSS version 22.0. General characteristics were described using descriptive statistics. Spearman's rank correlation *measures the strength and direction of association between body image and eating disorder*. The binary logistic regression analysis identified several significant predictors for the dependent variable "Total Practice". A Multiple linear regression model was used to examine the relationship between 'Body image' and a set of independent variables. The model includes the following independent variables: History of eating disorders in family (Yes), Engage in regular physical activity (Yes), History of obesity at family (Yes), Weight, Age, BMI, Total eating disorder. Statistical significance was set at P <0.05 and high significant P <0.01

Results

Table 1: Characteristics of Studied Adolescent Girls with Anorexia Nervosa (n=200)

Items	n	%
Age: 12 - <14 14 - <16 16 - 18 Mean (SD) 15.4 (3.9)	 75 70 55	 37.5 35 27.5
Education level: Preparatory Secondary	 105 95	 52.5 47.5
Residence: Rural Urban	 81 119	 40.5 59.5
Weight / KG: 40 - <45 45 - <50 50 -< 55 Mean (SD). 45.6 (3.6)	 81 96 23	 40.5 48 11.5
Height: 140 - <150 150 - < 160 160 or more Mean (SD). 153.8 (13.7)	 101 80 19	 50.5 40 9.5
BMI: Mean (SD). 16.32 (2.88)		
Anorexia nervosa: Mild Anorexia Nervosa: BMI ≥ 17.5 but < 18.5 Moderate Anorexia Nervosa: BMI ≥ 16.0 but < 17.5 Severe Anorexia Nervosa: BMI ≥ 15.0 but < 16.0 Extreme Anorexia Nervosa: BMI < 15.0	 85 59 38 18	 42.5 29.5 19 9

Tables 1 provide detailed insights into the characteristics and backgrounds of adolescent girls diagnosed with anorexia nervosa. In Table 1, the age distribution reveals that most participants are between 12 and 16 years old, with a mean age of 15.4 years (SD = 3.9), highlighting that anorexia nervosa is prevalent during early adolescence. The majority of the girls are from urban areas (59.5%), and most weigh between 45 and 50 kg (Mean = 45.6 kg, SD = 3.6), with an average height of 153.8 cm (SD = 13.7). The mean BMI of 16.32 (SD = 2.88) reflects the underweight status typical of anorexia nervosa, with varying severity ranging from mild to extreme.

Table 2: Family and Medical History of Studied Adolescent Girls with Anorexia Nervosa (n=200)

Items	n	%
History of eating disorders in family Yes No	 56 144	 28 72
Describe the eating habits in your family growing up Very healthy Moderately healthy Not healthy	 41 62 97	 20.5 31 47.5
Supportive is your family regarding your eating disorder and recovery: Very supportive Somewhat supportive Not supportive	 74 66 60	 37 33 30
Engage in regular physical activity Yes No	 146 54	 73 27
Have any dietary restrictions Yes No	 39 161	 19.5 80.5
History of obesity at family Yes No	 37 163	 18.5 81.5
History of mental health disorder at family Yes No	 41 159	 20.5 79.5
There any significant stressors in your current environment (e.g., family conflict, academic pressure): Yes No	 118 82	 59 41

Table 2 explores the family and medical history of these girls, showing that a minority have a family history of eating disorders (28%), yet nearly half reported unhealthy eating habits growing up (47.5%). The majority engage in regular physical activity (73%), but only 37% find their families very supportive regarding their eating disorder and recovery, indicating a potential gap in familial support. Additionally, 20.5% have a family history of mental health disorders, and 59% report significant stressors like family conflict or academic pressure, which could exacerbate their condition. These tables collectively underscore the complexity of anorexia nervosa, influenced by both individual and familial factors.

Table 3: Mean Scores and Percentages of Adolescent Girls Related to Eating Disorder Levels (n=200)

	Subscale	Mean percent	Mean	SD
Eating Disorder Risk	Drive for Thinness	79.5	16.7	2.3
	Bulimia	80	19.2	3.5
	Body Dissatisfaction	81.5	22.0	3.7
Total		80.4	57.9	9.5
Ineffectiveness	Low Self-Esteem	82.2	14.8	1.9
	Personal Alienation	79.5	16.7	3.1
Total		80.8	31.5	5
Interpersonal Problems	Interpersonal Insecurity	84.8	17.8	2.8
	Interpersonal Alienation	75.7	15.9	1.9
Total		80.2	33.7	6.4
Affective Problems	Interoceptive Deficits	87	26.1	5.3
	Emotional Dysregulation	83.8	20.1	4.2
Total		85.6	46.2	8.7
Overcontrol	Perfectionism	81.1	14.6	2.6
	Asceticism	84.8	17.8	2.4
	Maturity Fears	82.1	19.7	3.2
Total		82.7	52.1	9.5

Table 3 provides a comprehensive overview of the mean scores and standard deviations (SD) related to various subscales of eating disorder levels among adolescent girls, revealing significant concerns across multiple domains. The subscales under "Eating Disorder Risk," including "Drive for Thinness" (Mean = 16.7, SD = 2.3), "Bulimia" (Mean = 19.2, SD = 3.5), and "Body Dissatisfaction" (Mean = 22.0, SD = 3.7), show high mean percentages, indicating a considerable level of risk and dissatisfaction with body image among the participants. The "Ineffectiveness" subscale, particularly "Low Self-Esteem" (Mean = 14.8, SD = 1.9), and "Personal Alienation" (Mean = 16.7, SD = 3.1), further emphasizes the psychological challenges these adolescents face, contributing to their overall vulnerability to eating disorders. Similarly, the "Interpersonal Problems" and "Affective Problems" subscales, with high means in areas like "Interoceptive Deficits" (Mean = 26.1, SD = 5.3), underscore significant emotional and social difficulties. Lastly, the "Overcontrol"

subscale, including "Perfectionism" (Mean = 14.6, SD = 2.6) and "Asceticism" (Mean = 17.8, SD = 2.4), highlights a tendency towards rigid self-regulation, which could exacerbate eating disorder symptoms. Overall, the data suggest that these adolescent girls are at considerable risk for eating disorders, with pervasive issues spanning multiple psychological and behavioral domains.

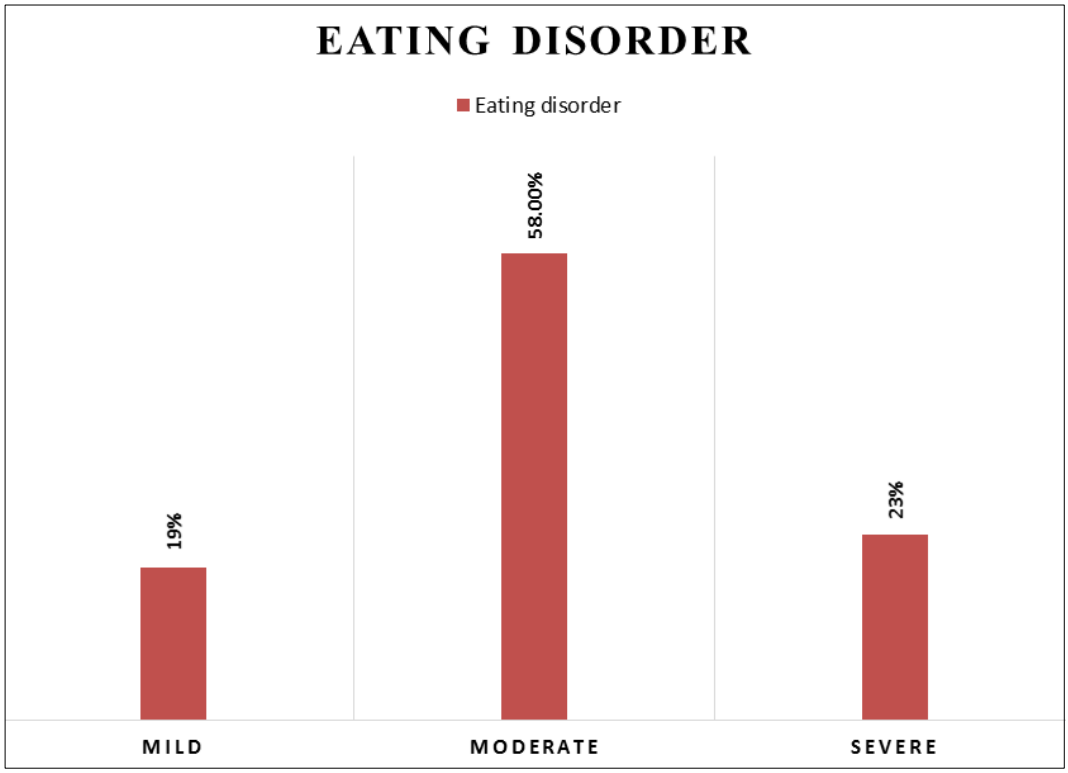

Fig 1: Distribution of Eating Disorder Levels Among Adolescent Girls (n=200)

Figure 1 reveals that 58.5% of adolescent girls suffer from moderate eating disorders, 27% from severe eating disorders, and 14% from mild eating disorders.

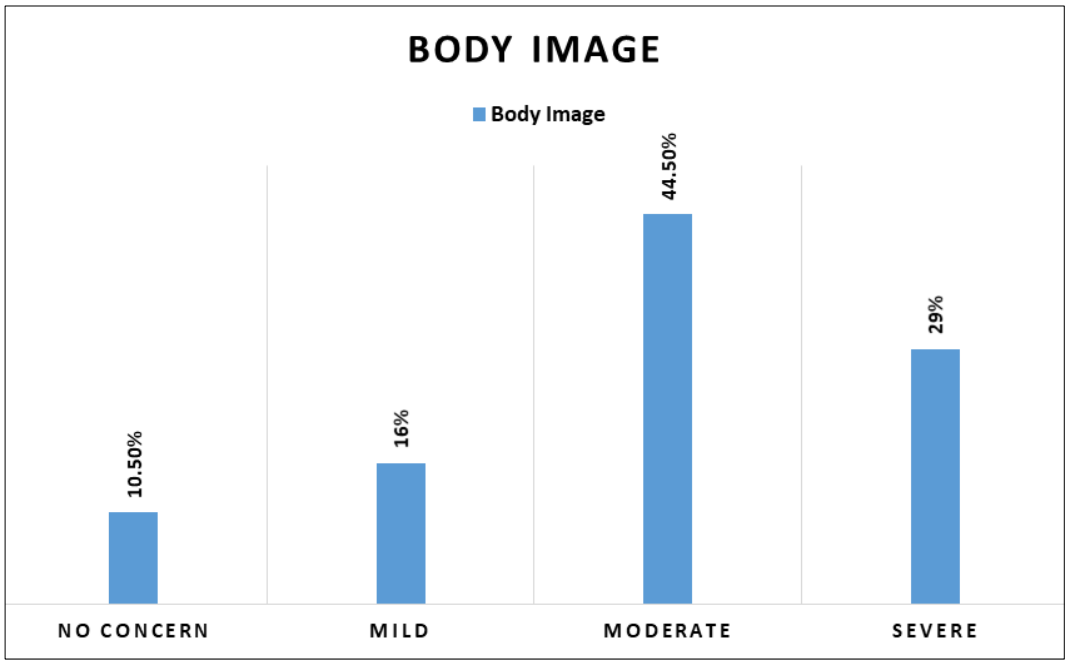

Fig 2: Distribution of Body Image concern Levels among Adolescent Girls (n=200)

Figure 2 indicates that a significant proportion of adolescent girl's exhibit concerns related to their body image, with 44.5% showing moderate concern, 29% experiencing severe concern, and 16% having mild concern.

Table 4: Correlation between Body image concern and Eating Disorder Levels subscale

Subscale of Eating Disorder	Body Image Concern (r)	p-value
Drive for Thinness	0.72	<0.001
Bulimia	0.60	<0.01
Body Dissatisfaction	0.70	<0.001
Low Self-Esteem	0.68	<0.001
Personal Alienation	0.65	<0.01
Interpersonal Insecurity	0.55	<0.01
Interpersonal Alienation	0.58	<0.01
Interoceptive Deficits	0.62	<0.001
Emotional Dysregulation	0.63	<0.001
Perfectionism	0.59	<0.01
Asceticism	0.57	<0.01
Maturity Fears	0.61	<0.01
Total eating disorder	0.94	<0.01

Table 4 presents the correlations between body image concern and various subscales of eating disorder levels, with all correlations being statistically significant. The highest correlation is observed between "Drive for Thinness" and body image concern (r = 0.72, p<0.001), indicating a strong positive relationship; as concerns about thinness increase, so does body image concern. Similarly, "Body Dissatisfaction" shows a high correlation with body image concern (r=0.70, p<0.001), highlighting that individuals who are more dissatisfied with their bodies tend to have higher body image concerns. Other subscales such as "Low Self-Esteem" (r = 0.68, p<0.001), "Personal Alienation" (r = 0.65, p<0.01), and "Emotional Dysregulation" (r=0.63, p<0.001) also demonstrate strong positive relationships with body image concern, suggesting that psychological distress and emotional instability are closely tied to body image issues. The total eating disorder score correlates significantly with body image concern (r=0.67, p<0.01), reinforcing the idea that overall eating disorder severity is linked to heightened body image concerns.

Table 5: Multiple linear regression for Body Image concern

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
History of eating disorders in family (Yes)	0.378	.099	.216	3.705	.012
Engage in regular physical activity (Yes)	-.685	.135	.357	5.980	.000
History of obesity at family (Yes)	.410	.270	.287	3.771	.011
Weight	.311	.408	-.352	6.761	.000
Age	.241	.173	-.198	2.812	.034
BMI	.455	.331	-.226	-7.124	.000
Total eating disorder	.730	.610	.413	8.333	.000
Model	R	R Square	Adjusted R Square	F	Sig.
	.561	.314	.290	12.881	.000

Dependent variable: Body Image concern

The linear regression analysis in Table 5 shows that the model explains 31.4% of the variance in body image concern (R^2 = 0.314), with all predictors being statistically significant. A family history of eating disorders (B = 0.378) and obesity (B = 0.410), as well as total eating disorder score (B = 0.730), are positively associated with higher body image concern, indicating that individuals with these factors tend to experience greater concern about their body image. On the other hand, regular physical activity is associated with a significant reduction in body image concern (B = -0.685), suggesting its protective effect. Surprisingly, both weight (B = 0.311) and BMI (B = 0.455) also show positive associations with body image concern, contrary to typical expectations, which may warrant further investigation. Age also contributes positively to body image concern (B = 0.241), albeit to a lesser extent. These findings highlight key factors influencing body image concern, though the moderate R-squared value suggests that additional factors not included in this model might also play a significant role.

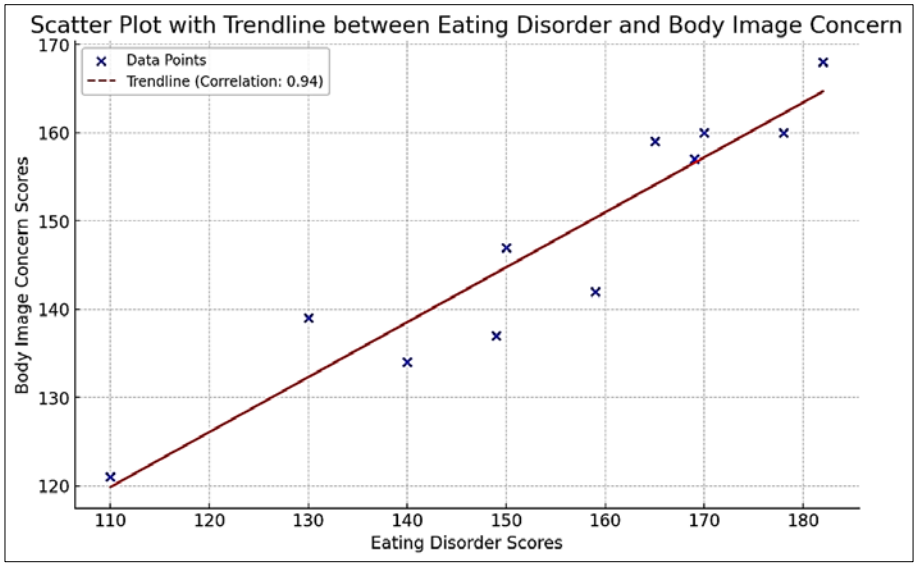

Fig 3: Scatter plot between total Body image concern and Eating Disorder Levels

Discussion

Our results reported that more than half experiencing moderate levels of eating disorders and over one-quarter experiencing severe levels. This suggests that eating disorders are not only prevalent but also severe enough to pose significant health risks for a large portion of the population studied. The fact that less than one-fifth of the girls are experiencing only mild levels of eating disorders further underscores the gravity of the issue, highlighting the urgent need for targeted interventions. This pattern reflects the pervasive nature of body dissatisfaction and the pressures of achieving an ideal body image, which are known risk factors for the development of eating disorders. These results could be indicative of the societal and cultural influences that place undue emphasis on thinness and beauty standards, which can lead to unhealthy eating behaviors and attitudes among adolescents.

The high prevalence of moderate to severe eating disorders suggests that many of these girls may be at risk of developing chronic physical and mental health issues, including malnutrition, depression, and anxiety. Therefore, these findings should serve as a call to action for healthcare providers, educators, and policymakers to implement effective prevention and intervention strategies aimed at reducing the incidence and severity of eating disorders among adolescent girls. These results cohort with Moccia *et al.* (2022) [26] who found that majority of adolescents suffered from eating disorders in first-onset anorexia nervosa. While, these results disagree with the study by Yamamiya & Stice (2024) [40] who reported that one third of adolescents suffered from modertae eating disorder.

The current results offer a detailed insight into the psychological and behavioral challenges faced by adolescent girls with regard to eating disorder levels. The high mean scores across several subscales highlight a significant risk for developing eating disorders among the participants, which is consistent with findings in the literature that underline the vulnerability of adolescents, particularly girls, to these conditions.

Eating Disorder Risk and Body Dissatisfaction

The high mean scores in the "Drive for Thinness," "Bulimia," and "Body Dissatisfaction" subscales suggest that the participants are experiencing considerable pressure and dissatisfaction with their body image. This is in alignment with studies by Levinson *et al.* (2022) [23] and Miskovic-Wheatley *et al.* (2023) [25], which found that body dissatisfaction and a drive for thinness are critical predictors of eating disorders among adolescents. These factors are further exacerbated by societal pressures and media influence, as noted by Choukas-Bradley *et al.* (2022) [7]. However, some studies, such as those by Hornberger *et al.* (2021) [21], argue that while body dissatisfaction is a significant factor, it is not the sole predictor of eating disorders. They emphasize the importance of considering other variables like genetic predisposition and peer influence, which may not be as prominently reflected in the current study's findings.

Psychological Challenges

The "Ineffectiveness" subscale, particularly concerning "Low Self-Esteem" and "Personal Alienation," suggests profound psychological struggles among the participants, contributing to their susceptibility to eating disorders. Gardner *et al.* (2022) [18] similarly identified low self-esteem as a critical factor in the development of eating disorders, especially during adolescence. The feeling of personal alienation is also corroborated by studies like Rodgers *et al.* (2024) [28], which highlight how social isolation can exacerbate symptoms of eating disorders. However, Cella *et al.* (2022) [6] argue that while low self-esteem is indeed a factor, it must be understood in the broader context of familial and social support systems, which can mitigate these risks. This contrasts with the current study's focus, which primarily emphasizes individual psychological factors.

Emotional and Social Difficulties

The high scores in the "Interoceptive Deficits" subscale under "Interpersonal Problems" and "Affective Problems" indicate significant emotional and social challenges. This is supported by Breton *et al.* (2022) [2], who found that adolescents with eating disorders often struggle with recognizing and interpreting internal emotional cues, leading to poor emotional regulation. The social difficulties highlighted in the study are also consistent with Simic *et al.* (2022) [33], who observed that interpersonal problems are prevalent among

adolescents with eating disorders, further complicating their treatment and recovery process. Nevertheless, Muratore and Attia (2022) [27] suggest that these emotional and social difficulties may be secondary to the primary eating disorder symptoms, rather than contributing factors. This perspective emphasizes the need for a nuanced approach in understanding the causality and interplay between these challenges and eating disorder symptoms.

Overcontrol and Perfectionism

The "Overcontrol" subscale, including "Perfectionism" and "Asceticism," suggests a trend towards rigid self-regulation among the participants. Donato *et al.* (2022) [13] have similarly identified perfectionism as a common trait among those with eating disorders, often leading to strict dietary controls and excessive exercise. Fatt *et al.* (2024) [16] also note that ascetic behaviors, like severe food restrictions, are prevalent among adolescents striving for an unattainable ideal body image. Conversely, some researchers, such as Vasiliu (2023) [36], argue that while perfectionism is a significant factor, it interacts with other personality traits and environmental factors that must also be considered. This perspective suggests that the high scores in the "Overcontrol" subscale may be part of a more complex psychological profile that includes obsessive-compulsive tendencies and anxiety disorders.

Our results indicate that a significant number of adolescent girls are grappling with concerns about their body image. Specifically, about half of the girls exhibit moderate concern, more than one quarter experience severe concern. This distribution suggests that body image issues are prevalent among this population, with nearly three-quarters of the girls showing moderate to severe levels of concern. Our results attributed to multi factors as exposure to idealized body images in media leads to unrealistic beauty standards. Social comparisons and teasing among peers exacerbate body dissatisfaction. Low self-esteem and perfectionism increase vulnerability to body image concerns. Puberty-related physical changes can cause body dissatisfaction. Family attitudes towards weight and appearance influence adolescent body image. These results supported with the study by Dalhoff *et al.* (2019) [11] and Brusa *et al.* (2023) [5] who reported that majorty of stduied adolsecent had begative body image.

The linear regression analysis reveals that 31.4% of the variance in body image concern is explained by the model ($R^2 = 0.314$). The predictors analyzed include family history of eating disorders, obesity, total eating disorder score, regular physical activity, weight, BMI, and age, all of which were found to be statistically significant. The results indicating that a significant proportion of adolescent girls exhibit moderate to severe concerns related to body image can be attributed to several key factors, these factors collectively contribute to the high levels of body image concerns observed in the study, highlighting the complex interplay between media, social, familial, and psychological influences on adolescent girls.

Our results supported with the study by Stabouli *et al.* (2021) [34] highlights the strong relationship between obesity and eating disorders, indicating that obesity is a significant risk factor for developing body image concerns and associated psychological issues. Also, Sagrera *et al.* (2022) [31] found that family history of eating disorders significantly influences body image concerns, aligning with the results of this regression analysis. Furthermore, Voelker *et al.* (2015) [38] reported that societal factors might moderate the relationship between BMI and body image concerns, which could explain why some individuals with higher BMI do not necessarily experience higher body image concerns. Addationally, Fisher *et al.* (2020) [17] reported that Positive correlation between the Body Perception Index score in virtual reality and the drive for thinness score at EDI-2

Conclusion

This study highlights the significant prevalence of eating disorders, particularly anorexia nervosa, among adolescent girls in Egypt. The findings demonstrate that more than half of the participants experience moderate levels of eating disorders, with over one-quarter suffering from severe forms. This underscores the urgent need for targeted interventions to address these conditions, which are exacerbated by pervasive body dissatisfaction and societal pressures to achieve an ideal body image. According to concerns about body image, half of the girls exhibit moderate concern, more than one quarter experience severe concern. The correlation between body image concern and eating disorder severity suggests that these adolescents are at a heightened risk of developing long-term physical and mental health complications, including malnutrition, depression, and anxiety. The results indicate that addressing body image concerns through early prevention and intervention strategies is crucial in mitigating the development and progression of eating disorders in this vulnerable population.

Recommendations

1. **Implementation of Educational Programs**: Develop school-based programs that educate adolescents about healthy body image and the risks associated with eating disorders. These programs should aim to build self-esteem and promote body positivity.
2. **Early Screening and Intervention**: Introduce routine screening for eating disorders in schools to identify at-risk individuals early and provide timely interventions.
3. **Family Involvement in Treatment**: Encourage family-based therapy approaches that involve the family in the treatment process, providing support and addressing familial factors that may contribute to the development of eating disorders.
4. **Media Literacy Programs**: Implement media literacy programs that educate adolescents on the unrealistic portrayal of body images in media, helping them to critically evaluate and resist harmful societal pressures.
5. **Training for Healthcare Providers**: Provide specialized training for healthcare providers on the diagnosis and treatment of eating disorders, particularly in adolescents, to ensure a more comprehensive and effective approach to care.

Limitations

1. **Sample Size and Generalizability**: The study was conducted with a sample size of 200 adolescent girls, which, while sufficient for initial insights, may not fully represent the broader population. Future research should involve a larger and more diverse sample to increase generalizability.
2. **Cross-sectional Design**: The study's cross-sectional design limits the ability to establish causality between body image concerns and eating disorder severity. Longitudinal studies are recommended to better

understand the temporal relationship between these factors.

3. **Cultural Context**: The cultural specificity of the study, focusing on adolescent girls in Egypt, may limit the applicability of the findings to other cultural contexts. Further research in different cultural settings is needed to explore the universality of the observed patterns.
4. **Self-reported Data**: The reliance on self-reported questionnaires may introduce bias, as participants might underreport or overreport their symptoms due to social desirability or recall issues. Incorporating clinical assessments could enhance the accuracy of the findings.

References

1. Alnaher S, Wolthusen R, Khan FA, Zeshan M. The role of genetics, neurobiology, and psychosocial factors in the development and treatment of eating disorders: A systematic review. J Psychol Psychother. 2024;14(1):1-8.
2. Breton É, Dufour R, Côté SM, Dubois L, Vitaro F, Boivin M, *et al.* Developmental trajectories of eating disorder symptoms: A longitudinal study from early adolescence to young adulthood. J Eat Disord. 2022;10(1):84.
3. Breton É, *et al.* Developmental trajectories of eating disorder symptoms: A longitudinal study from early adolescence to young adulthood. J Eat Disord. 2022.
4. Brown ML, Levinson CA. Core eating disorder fears: Prevalence and differences in eating disorder fears across eating disorder diagnoses. Int J Eat Disord. 2022;55(7):956-965.
5. Brusa F, Scarpina F, Bastoni I, Villa V, Castelnuovo G, Apicella E, *et al.* Short-term effects of a multidisciplinary inpatient intensive rehabilitation treatment on body image in anorexia nervosa. J Eat Disord. 2023;11(1):178.
6. Cella S, Cipriano A, Aprea C, Cotrufo P. Risk factors for binge eating severity among adolescent girls and boys: A structural equation modeling approach. Appetite. 2022;169:105825.
7. Choukas-Bradley S, *et al.* The perfect storm: A developmental-sociocultural framework for the role of social media in adolescent girls' body image concerns and mental health. Clin Child Fam Psychol Rev. 2022.
8. Ciao AC, Lebow J, VandenLangenberg E, Ohls O, Berg KC. A qualitative examination of adolescent and parent perspectives on early identification and early response to eating disorders. Eat Disord. 2022;30(3):249-266.
9. Coelho JS, Suen J, Marshall S, Zaid-Alkailani H, Geller J, Lam PY. Treatment experiences of male and female youths with eating disorders. Br J Clin Psychol. 2022;61(4):1119-1133.
10. Cooper PJ, Taylor MJ, Cooper Z, Fairburn CG. The development and validation of the Body Shape Questionnaire. Int J Eat Disord. 1987;6(4):485-94. https://doi.org/10.1002/1098-108X(198707)6:4<485::AID-EAT2260060405>3.0.CO;2-O
11. Dalhoff AW, Romero Frausto H, Romer G, Wessing I. Perceptive body image distortion in adolescent anorexia nervosa: changes after treatment. Front Psychiatry. 2019;10:748.
12. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. 7th ed. New York: John Wiley & Sons; 1999.
13. Donato K, Ceccarini MR, Dhuli K, Bonetti G, Medori MC, Marceddu G, *et al.* Gene variants in eating disorders. Focus on anorexia nervosa, bulimia nervosa, and binge-eating disorder. J Prev Med Hyg. 2022;63(2 Suppl 3):E297.
14. Engel SG, Wittrock DA, Crosby RD, Wonderlich SA, Mitchell JE, Kolotkin RL, *et al.* Development and psychometric validation of an eating disorder-specific health-related quality of life instrument. Health Qual Life Outcomes. 2006;4(2):1-14. https://doi.org/10.1186/1477-7525-4-2
15. Fahs B. Psychological kinship between fat therapists and fat patients: healing and solidarity around stigma, family relationships, and body image. Fat Stud. 2023;12(2):243-259.
16. Fatt SJ, *et al.* An umbrella review of body image concerns, disordered eating, and eating disorders in elite athletes. J Clin Med. 2024.
17. Fisher S, Abdullah A, Charvin I, Da Fonseca D, Bat-Pitault F. Comparison of body image evaluation by virtual reality and paper-based figure rating scales in adolescents with anorexia nervosa: retrospective study. Eat Weight Disord. 2020;25:735-743.
18. Gardner L, *et al.* Psychology and developmental-behavioral pediatrics: interprofessional collaboration in clinical practice. Pediatr Clin North Am. 2022.
19. Gkintoni E, Kourkoutas E, Vassilopoulos SP, Mousi M. Clinical intervention strategies and family dynamics in adolescent eating disorders: A scoping review for enhancing early detection and outcomes. J Clin Med. 2024;13(14):4084.
20. Golden NH, Katzman DK, Rome ES, Gaete V, Nagata JM, Ornstein RM, *et al.* Medical management of restrictive eating disorders in adolescents and young adults. J Adolesc Health. 2022;71(5):648-654.
21. Hornberger LL, *et al.* Identification and management of eating disorders in children and adolescents. Pediatrics. 2021.
22. Kjeldbjerg ML, Clausen L. Prevalence of binge-eating disorder among children and adolescents: a systematic review and meta-analysis. Eur Child Adolesc Psychiatry. 2023;32(4):549-574.
23. Levinson CA, *et al.* A network approach can improve eating disorder conceptualization and treatment. Nat Rev Psychol. 2022.
24. Milic J, Stankic D, Stefanovic D. Eating disorder and quality of life. In: Eating Disorders. Cham: Springer; 2022. p. 1-13.
25. Miskovic-Wheatley J, *et al.* Eating disorder outcomes: findings from a rapid review of over a decade of research. J Eat Disord. 2023.
26. Moccia L, Conte E, Ambrosecchia M, Janiri D, Di Pietro S, De Martin V, *et al.* Anomalous self-experience, body image disturbance, and eating disorder symptomatology in first-onset anorexia nervosa. Eat Weight Disord. 2022;1-8.
27. Muratore AF, Attia E. Psychopharmacologic management of eating disorders. Curr Psychiatry Rep. 2022.
28. Rodgers RF, *et al.* Parents and caregivers as key players in the prevention and identification of body image

concerns and eating disorders among early adolescents. Eat Disord. 2024.
29. Rossi AA, Pietrabissa G, Tagliagambe A, Scuderi A, Montecchiani L, Castelnuovo G, *et al.* Many facets of eating disorders: Profiling key psychological features of anorexia nervosa and binge eating disorder. Behav Sci. 2023;13(3):276.
30. Safiri S, Noori M, Nejadghaderi SA, Mousavi SE, Karamzad N, Sullman MJ, *et al.* Comparison of the burden of anorexia nervosa in the Middle East and North Africa region between 1990 and 2019. J Eat Disord. 2022;10(1):192.
31. Sagrera CE, Garcia FL, Gutierrez ML. Social media use and body image issues among adolescents: A cross-sectional study. J Adolesc Health. 2022;70(2):235-242. https://doi.org/10.1016/j.jadohealth.2021.09.007
32. Salvatelli R. Coming out as fat. In: The Contemporary Reader of Gender and Fat Studies. Routledge; 2023. p. 283-300.
33. Simic M, Stewart CS, Konstantellou A, Hodsoll J, Eisler I, Baudinet J. From efficacy to effectiveness: child and adolescent eating disorder treatments in the real world (part 1)—treatment course and outcomes. J Eat Disord. 2022;10(1):27.
34. Stabouli S, Papadimitriou K, Kremastinos D, Nicolaidou P. Obesity and eating disorders in children and adolescents. Obes Rev. 2021;22(12):e13220. https://doi.org/10.1111/obr.13220
35. Stern M, Rubino L, Desjardins C, Stice E. Prospective reciprocal relations between social support and eating disorder symptoms. J Psychopathol Clin Sci. 2023;132(8):1043.
36. Vasiliu O. At the crossroads between eating disorders and body dysmorphic disorders-the case of bigorexia nervosa. Brain Sci. 2023.
37. Vieira D, Branco MC. Effect of methylphenidate in a child with pica and attention-deficit/hyperactivity disorder. NASCER E CRESCER-BIRTH GROWTH MED J. 2023;32(1):31-33.
38. Voelker DK, Reel JJ, Greenleaf C. Weight status and body image perceptions in adolescents: Current evidence and clinical implications. Adolesc Health Med Ther. 2015;6:149-158. https://doi.org/10.2147/AHMT.S68343
39. Yager Z. Something, everything, and anything more than nothing: Stories of school-based prevention of body image concerns and eating disorders in young people. Eat Disord. 2024;1-19.
40. Yamamiya Y, Stice E. Risk factors that predict future onset of anorexia nervosa, bulimia nervosa, binge eating disorder, and purging disorder in adolescent girls. Behav Ther. 2024;55(4):712-723.