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# Prevalence of Eating Disorders and Disordered Eating Attitudes in Students in Arab Countries: A Scoping Review

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**Abstract**

Anorexia nervosa, bulimia nervosa, and binge-eating disorder represent the specific eating disorders. Although eating disorders (EDs) are a rare psychiatric problem globally, millions of people are exposed to severe health consequences including impairments in health, psychosocial functioning, and quality of life. Young people and adolescents, particularly females, are associated with a higher rate of disordered eating attitudes and EDs than the general population. The aim of this scoping review was to provide an overview or map of ED and disordered eating attitude prevalence in students in Arab countries, both female and male, and to identify contributing factors. Arksey and O'Malley's six-stage framework for scoping reviews was used to guide the process, which returned a total of 20 relevant articles covering 12 of the 22 member countries in the League of Arab States. The average prevalence of ED was 31.4% in a sample of 17,679 students aged 12-33, with a range from9.6% to 74.5%. Prevalence was higher in female students compared to male students, and the key contributing factors included age, gender, BMI, eating habits, and academic attainment. Given the limitations of this scoping review, especially the lack of a formal critical appraisal process for the included articles, future systematic reviews can use it as a baseline, while empirical researchers and policymakers might pursue its preliminary conclusions.

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## Introduction

As a group of mental illnesses that affects millions of people worldwide, particularly in Western cultures and young adult and adolescent populations, eating disorders (EDs) are characterised by complex and damaging relationships with food, and eating.[1] EDs are also associated with distorted body image perceptions, unsuitable weight control

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techniques, and severe purging or eating behaviours (or a combination of both), which lead to insufficient or excessive food intake.[2-3] The mortality rate of EDs is high.[4]

According to the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) eating disorders listed under the category of "Feeding & Eating Disorders" and describes that they are "characterized by a persistent disturbance of eating or eating-related behaviour that results in the altered consumption or absorption of food that significantly impairs physical health or psychosocial functioning.[5] Several categories of the psychiatric condition exist, including binge eating disorder (BED), anorexia nervosa (AN), and bulimia nervosa (BN). Each of these conditions is associated with a unique symptom profile and body weight or shape.[6-7] Specific treatment strategies and long-term, often life-threatening health consequences are also linked to these conditions.[3,8] Disordered eating attitudes, which can be defined as abnormal feelings, behaviours, and beliefs regarding food, are often considered milder types of ED that may or may not warrant a diagnosis of a specific ED. However,disordered eating is significant because they can precede ED, give rise to ED, or indicate ED presence.[9] The term of disordered eating is a descriptive phrase, not a diagnosis. Hence, while many people who have disordered eating may fit the criteria for Eating Disorder Not Otherwise Specified (EDNOS), it also is possible to have disordered eating that do not fit within the current confines of an ED diagnosis.

The lifetime prevalence rates for EDs are relatively low in the general population. However, based on Melisse *et al.*[10] review, 13–55% was at high risk for EDs. On ED-screening instruments, females (11.4–54.8%) displayed more to be at high risk for EDs than males (2–47.3%)with US studies involving female participants reporting that the estimated levels are 1.5% and 0.9% for BN and AN, respectively, which the median age of onset of those disorders among the participants are ranged from 18–21 years.[11] The public health burden associated with these conditions, the severity of their effects on every organ, and the significance of the comorbid conditions associated with EDs have contributed to the growing attention the condition has received in research studies.[12] For example, health-related outcomes of EDs include poor mental health, digestive disorders, cardiovascular problems, impaired reproductive function, fatigue, substance abuse, gestational diabetes, and pregnancy complications.[8] Furthermore, low bone mineral density (BMD) is a common complication of AN. BMD can develop osteoporosis, or fragile bones, which can cause lifelong debilitating consequences.[13]

An especially critical considerationthat has caught the attention of the research community in past years is that, despite the rare nature of EDs in the general population,[1] adolescents, young adults, and college-age individuals, especially females, are at much greater risk of suffering from EDs and disordered eating attitudes. As a case in point, several studies have reported that ED prevalence in college-aged students ranges from 8% to 20.5%, which is significantly higher than the prevalence of these conditions in the general population.[14-17]

An important outcome of the growing level of attention paid in the literature towards EDs and disordered eating attitudes has been the publication of systematic literature reviews (SLRs) seeking to collate and synthesise results from epidemiological studies conducted in specific settings (e.g., world regions or in specific populations such as medical students).[18] Prompted by the recognition that the epidemiology of EDs, as is the case with other health conditions, varies from context to context,[19] SLRs such as Kolar *et al.*[20] and Dahlgren *et al.*[21] have sought to offer accurate estimates of ED prevalence in Latin American and the Nordic countries, respectively. In both cases, the reviewers stressed that accurate information about ED prevalence can play a vital role in evidence-based policy making and practice, particularly regarding the manner in which ED-focused public health interventions should be designed and implemented. Therefore, the aim of this study was to conduct a scoping review that collates, synthesises, and – to the greatest possible extent – critically appraises the results from a growing body of literature pertaining to ED and disordered eating attitude prevalence in students in Arab countries. A cursory literature search indicated that multiple empirical studies have sought to investigate ED prevalence, as well as the risk of disordered eating attitudes, in student populations in Arab countries such as Kuwait, the Kingdom of Saudi Arabia (KSA),

United Arab Emirates (UAE) and Jordan, among others. However, to the best of our knowledge, no previous review study has been conducted to synthesise these findings. Thus, as this scoping review is the first to synthesise results from existing studies relevant to the Arab countries, it has implications for evidence-based policy and further research. Additionally, the scoping review's focus on the factors that contribute to ED and disordered eating attitudes in Arab countries can play a role inguiding healthcare initiatives and future empirical and review studies across the region.[22]

Based on the above, the following research question was established: "What is the prevalence of ED and disordered eating attitudes in students in Arab countries, and what are the contributing factors?". In addition, the aim of the research was decided as follows: "To provide an overview or map of ED and disordered eating attitude prevalence in students in Arab countries, and to identify contributing factors". Finally, to guide the reviewers in addressing this research question and aim, two objectives were established: (i) To synthesise data regarding ED and disordered eating attitude prevalence in students in Arab countries; and (ii) To identify the main factors that can account for ED and disordered eating attitude prevalence in the target population.

## Methodology

### Scoping Review

Arksey and O'Malley's[23] six-stage framework for scoping reviews was used to guide the process of completing this review. Although refinements have been made to this framework in the years since its publication,[24] and although systematic literature reviews (SLRs) address many of the core limitations associated with scoping reviews,the rationale for choosing a scoping review over an SLR was based on an important consideration. Specifically, the aim was to provide an overview or map of the available evidence regarding ED prevalence in students in Arab countries, given the lack of previous reviews. As Munn *et al.*[25] noted, this is one area in which scoping reviews are valuable, not least because an overview or map of a research issue can inform subsequent systematic reviews.

The six stages of the scoping review framework proposed by Arksey and O'Malley[23] are the following: (i) selecting a research question; (ii) identifying relevant studies; (iii) selecting relevant studies; (iv) interpreting and synthesising the data; (v) collating, summarising, and reporting the results; and (vi) an optional consultation initiative. With the exception of the final consultation initiative, which typically involves using stakeholder discussions for validation, the rest of the framework was applied. To promote the trustworthiness of the review, which is important given this review's aim of using its results to inform further research and evidence-based policy,[26] the process adopted for this scoping review is described in the rest of this section.

### Search Strategy

The electronic databases included in the search were Pub Med, Psych Info, Google Scholar, and MEDLINE. To identify relevant studies for inclusion in this scoping review, the following search term was constructed and entered into the databases without field restriction: ("prevalence") AND ("eating disorder" OR "binge eating disorder" OR "anorexia nervosa" OR "bulimia nervosa" OR "eating disorder not otherwise specified" OR "disordered eating attitudes") AND ("Arab" OR "Gulf Cooperation Council") AND ("young adult" OR "adolescent" OR "university student" OR "student" OR "college student" OR "secondary school").

The search was undertaken in accordance with the PRISMA guidelines, and the selection of relevant studies was informed by the process advocated by Aveyard.[27] Specifically, a reference manager was used to store the search results; duplicate records were excluded; article titles and abstracts were manually screened against the inclusion and exclusion criteria (see Section 2.3); reference lists were searched for further relevant articles; full texts were screened to against the same criteria to assess their eligibility for inclusion; and finally, the remaining articles were included in the scoping review.

### Inclusion and Exclusion Criteria

Since search results are likely to containarticles that are unrelated to the research aim,[28] inclusion and exclusion criteria were established in advance to ensure that only relevant articles were considered in the scoping review. To ensure that up-to-date evidence was included in the review, only those articles published after 2012 were included. Additionally, to avoid difficulties arising from the need to translate non-English articles, articles

were included only if they were written in English. Since no formal critical appraisal process was utilised in this scoping review, only peer-reviewed articles were included (quantitative, qualitative, mixed methods, and review studies). Epidemiological measures (e.g. incidence or mortality) and dissertations were excluded.

A key criterion for including articles in this scoping review was that the measurement tool used for assessing ED and disordered eating attitudes in Arabic student populations was a revised version of the eating attitudes test (EAT-26 that including restrictive dieting, fasting, using of laxatives and diureticsself-induced vomiting and/or binge eating). The rationale for this was that EAT-26 has been validated and is considered internally consistent and reliable in both clinical and non-clinical Arabic samples.[29] Additionally, since young people, adolescents, and students are an at-risk population for ED and disordered eating attitudes, only those studies addressing this population were included in the scoping review. Finally, literature was excluded if it did not pertain directly to one of the 22 member countries in the League of Arab States.[30]

## Results

### Search Summary

We have collected 49 studies following the EAT-26 survey. However, 29 papers were excluded due to factors, such as being non-Arab population, age group was younger or older than college age, not using the EAT-26 survey, and being published before 2005. An overview of the studies included in this scoping review (n = 20) is given in Table 1. Each study adopted a quantitative, cross-sectional design, which is suitable given the aim of taking a snapshot of the target populations at a particular point in time.Additionally, most were conducted in the KSA (n = 10), one study involved 7 Arab countries 31, and the other countries included in this sample of studies were Kuwait (n = 2), Jordan (n = 2), Sudan (n = 1), Lebanon (n = 1), the UAE (n = 1), Egypt (n = 1), and Morocco (n = 1). Therefore, 12 of the 22 members countries in the League of Arab States were addressed in this scoping review.

The total sample size addressed by this scoping review was 17,679 students aged 12-33. The smallest sample (n = 100) was associated with Bano *et al.*[32] study and the largest (n = 4,698) with Musaiger *et al.*[31] cross-sectional analysis of students in 7 Arab countries. Most of the studies included both males and females in their sample (n = 11), followed by only females (n = 8) and only males (n = 1). In each case, the outcome measures addressed in the study included ED prevalence or the risk of disordered eating attitudes, and EAT-26, among other measurement tools (e.g., anthropometric measurements of height and BMI, as well as the BSQ and SATAQ-4), were used to collect data.

### Prevalence of ED and Disordered Eating Attitudes

The average prevalence of disordered eating attitudes and ED reported across the 12 included member countries in the League of Arab States was 31.4%. Notably, significant variations in prevalence were observed between the countries. For example, the countries with the highest prevalence were Egypt (73.3%)[33] and Lebanon (74.5%)34, but it should be emphasised that only one study was included from each of these settings. The lowest prevalence rate was reported in Morocco (9.6%),[35] but this study only assessed bulimia nervosa (BN), thereby excluding other EDs.

Average prevalence across the studies conducted in the KSA (n = 10) amounted to 29.7%,with a range of 21%in Ha'il[32] to 45.5% in Dammam.[36] As for the average prevalence associated with the other countries included in this scoping review, Sudan, Jordan, and the UAE were lower than the KSA at 21.1%, 18.9%, and 20%, respectively. Average prevalence from the studies conducted in Kuwait (n = 2) was higher compared to the KSA at 46.4%.

All of the studies which included both females and males reported that the prevalence of ED and disordered eating attitudes were higher in the former population when compared to the latter (n = 8). In certain studies, the difference in ED prevalence and disordered eating attitude was significant (e.g., 30% higher for females),[32] while in other studies, the difference was comparatively small (e.g., 5.1% higher for females).[37] For the studies which included only females (n = 8), the average prevalence was 30.9%, compared to 20.4% for the only all-male study in this scoping review.

**Table 1: Overview of Included Studies**

| Author(s) | Date | Design | Setting | Population | Sample Size | Age Group (years) | Male/Female /Both | Measurement Tools | Results |
|---|---|---|---|---|---|---|---|---|---|
| Abdelrahim *et al.* | (2012)[38] | Cross-sectional | Sudan | University students | 340 | 17-23 | Both | EAT-26 and Body Shape Questionnaire (BSQ) | 21.1% at risk of ED |
| Bano *et al.* | (2013)[32] | Cross-sectional | Ha'il, KSA | Adolescents and young adults | 100 | 18-25 | Both | EAT-26 | 36% and 6% at risk of ED for females and males, respectively |
| Schulte and Thomas | (2013)[39] | Cross-sectional | UAE | Adolescents | 361 | 19 (mean) age | Both | EAT-26 | 20% at risk of ED |
| Musaiger *et al.* | (2013)[31] | Cross-sectional | Algeria, Jordan, Kuwait, Libya, Palestine, Syria, and UAE | Adolescents | 4,698 | 15-18 | Both | EAT-26 and obesity reference | 26.7% (Libya), 31.7% (Palestine), 22.9% (Syria), and 33.5% (UAE) at risk of ED |
| Allihaibi | (2015)[40] | Cross-sectional | Makkah, KSA | Secondary school students | 180 | 15-19 | Female | EAT-26 | 26.1% at risk of ED |
| Fallatah *et al.* | (2015)[41] | Cross-sectional | Jeddah, KSA | Secondary school students | 425 | 15-18 | Female | EAT-26 | 32.9% at risk of ED |
| Kilani | (2017)[37] | Cross-sectional | Jordan | University students | 4,565 | 18-22 | Both | EAT-26 | 14.2% at risk of ED (15.7% and 10.6% for females and males, respectively) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| El-Bagoury *et al.* | (2017)[33] | Cross-sectional | Egypt | University students | 445 | 17-26 | Both | EAT-26 | 73.3% at risk of ED |
| Makdad *et al.* | (2017)[35] | Cross-sectional | Morocco | High school and university students | 367 | 12-19 | Both | EAT-26 and hospital scale anxiety and depression (HAD) | 9.6% bulimia prevalence (13.5% and 5.3% in females and males, respectively) |
| Alwosaifer *et al.* | (2018)[36] | Cross-sectional | Dammam, KSA | University students | 670 | 18-23 | Both | EAT-26 and socio-cultural attitudes towards appearance questionnaire (SATAQ-4) | 45.5% at risk of ED |
| Gharaibah *et al.* | (2018)[42] | Cross-sectional | Jordan | Secondary school students | 738 | 14-16 | Both | EAT-26 | 23.6% ED risk (29.4% and 16.4% for females and males, respectively) |
| Taha *et al.* | (2018)[43] | Cross-sectional | Taif, KSA | University students | 1,200 | 17-33 | Female | EAT-26 | 35.4% at risk of ED |
| Alkazemi *et al.* | (2018)[44] | Cross-l sectiona | Kuwait | University students | 1,147 | 19-25 | Female | EAT-26 | 46.4% at risk of ED |
| Almuhlafi *et al.* | (2018)[45] | Cross-sectional | Tabuk, KSA | Secondary school students | 480 | 16 (mean age) | Female | EAT-26 | 30.8% reported binge eating, 7% reported purging, 5.3% reported laxative usage |
| Fatima *et al.* | (2018b)[46] | Cross-sectional | Arar, KSA | University students | 120 | 18-23 | Female | EAT-26 | 26.6% at risk of ED |
| Fatima *et al.* | (2018a)[47] | Cross-sectional | Arar, KSA | University students | 160 | 18-23 | Female | EAT-26 | 24.1% at risk of ED |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Fatima and Ahmad | (2018)[48] | Cross-sectional | Arar, KSA | Secondary school students | 314 | 15-19 | Female | EAT-26 | 25.5% at risk of ED |
| Farchakh *et al.* | (2019)[34] | Cross-sectional | Lebanon | University students | 627 | 19-24 | Both | EAT-26 | 74.5% at risk of ED |
| Alhazmi and Al-Johani | (2019)[49] | Cross-sectional | Medina, KSA | University students | 342 | 22 (mean age) | Both | EAT-26 | 28.7% at risk of ED |
| Ebrahim *et al.* | (2019)[50] | Cross-sectional | Kuwait | University students | 400 | 21 (mean | Male | EA-26 | 20.4% at risk of ED |

**Discussion**

After discussing the results from the previous section against those reported elsewhere in the literature, this section draws on evidence from the included studies (n = 20) to achieve the second review objective: namely, to identify the main factors that can account for ED and disordered eating attitude prevalence in the target population.

During adolescence and young adulthood, countless studies have demonstrated that individuals are at heightened risk for ED and disordered eating attitudes. This is especially true in females, who often become extremely conscious of their body image, and consequently adopt inappropriate weight loss methods.[1] Empirical studies of students have been published in diverse research contexts, indicating that both females and males are more likely to develop EDs and disordered eating attitudes during adolescence and young adulthood.[21,51] While disordered eating attitudes are not always considered types of ED, they are critical to consider because they represent an important precursor to ED, and they can also indicate the presence of ED.[9]

Therefore, the results of this study regarding the prevalence of ED and the risk of disordered eating attitudes in adolescent and young adult students in Arab countries are largely consistent with the literature. Interestingly, despite the fact that males in Arab countries, including the KSA, are typically associated with greater levels of overweight and obesity.[52] Females were identified as having a higher prevalence of EDs and disordered eating attitudes in the 12 Arab countries included the scoping review. Nevertheless, it is important to emphasise that, similar to the results reported elsewhere in the literature in other research settings, EDs and disordered eating attitudes were still found to affect 5-30% of the participating male students.

The studies included in this scoping review, as well as those published elsewhere in the literature, have highlighted several factors that can account for this study's results regarding the heightened prevalence of ED and disordered eating attitudes in students, particularly in females.Increasing levels of body image consciousness in female students, including those in Arab countries, have been linked

to pressures from mass media and Westernisation, which often imply a connection between beauty standards and thinness.[38,42,45,49-50] In the case of male students, Ebrahim *et al.*[50] emphasised that similar pressures can even lead to body dissatisfaction in this population, but typically for reasons associated with body fat and muscle mass rather than a pre occupation with thinness.

Empirical results from various research settings, including Latin America, Western Europe, and the Nordic countries, have found that strong predictors of ED and disordered eating attitudes in the general population are age and gender.[3,8,18,20-21] The results of this scoping review provide a preliminary confirmation of these results for the Arab countries, particularly given the well-documented, reliable, and valid connections between the female gender, adolescent or young adult student status, and the heightened risk of ED and disordered eating attitudes.

The studies included in this scoping review highlighted several other factors that are correlated with and, to a certain extent, may contribute to ED and disordered eating attitude prevalence. In Alhazmi and Al-Johani[49] KSA-based study, the researchers reported a link between obesity (i.e., BMI) and a high risk of ED, as well as academic attainment and a high risk of ED.While the connection between obesity and ED risk, as an extensively researched issue, has been documented else where in the literature, contrasting results have been reported regarding the connection between academic attainment and ED risk. For example, Alhazmi and Al-Johani[49] found that low academic attainment was associated with an increased risk of ED, whileSundquist *et al.*[53] Sweden-based study reported the opposite. In a sample of Malaysian students, Zuman *et al.*[54] results were consistent with those of Alhazmi and Al-Johani,[49] but further research is certainly warranted in the Arab countries to explore this issue. Finally, three of the included studies documented that, in adolescent females in the KSA, vegetarianism was significantly associated with a greater risk of ED and disordered eating attitudes.[46-48] Evidence suggests that among patients with AN, about 50% report eating some form of vegetarian diet (45-54%), compared to about 6-34% of adolescent and young adult women overall.[55] The obtained findings confirm those reported in the United States, where vegetarianism in females was identified as a risk factor for ED.[55] While this is an interesting relationship, each of the studies suffers from significant methodological concerns which prevent the identification of confounding variables and the nature of the causal relationship between vegetarianism and EDs. Hence, further exploration of the underexplored factors that may be implicated in EDs and the risk of disordered eating attitudes should be investigated, particularly in the Arab context.

**Conclusion**

Eating disorders are potentially life-threatening conditions with severe long-term health consequences. Studies from around the world, including the Arab countries, indicate that ED prevalence is greater in adolescent and young adult populations than it is in the general population. Therefore, understanding the risk factors for EDs, as well as the prevalence of EDs and disordered eating attitudes, is essential, particularly in terms of resource allocation, capacity building, and guiding the design and implementation of evidence-based public health interventions. Although scoping reviews suffer from clear limitations when compared to systematic literature reviews, this review has provided baseline data that future researchers can use as a foundation for further study of this issue in the Arab countries. Conducting an SLR would benefit from a systematic critical appraisal of the studies included in this review and a more comprehensive search strategy. Additionally, future empirical research initiatives could target the key considerations highlighted in this review. In particular, the connection between academic attainment, vegetarianism, and ED risk is an area that merits further attention.

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**Conflicts of Interest**

All authors mentioned no conflicts of interest in this research.

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