# RESEARCH

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# Global prevalence of eating disorders in children: a comprehensive systematic review and meta-analysis

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# Abstract

Background Eating disorders (EDs) are known as chronic mental disorders that can cause adverse physical and mental effects and affect different age groups, including children, and disrupt their growth and development. Based on this, the aim of this research is to determine the global prevalence of EDs in children.

Methods To conduct this research, each of the databases PubMed, Scopus, Web of science, Embase, ScienceDirect and Google Scholar search engine were systematically searched using relevant keywords ("prevalence,""outbreak,""ea ting disorder,""feeding disorder,"eating problem,"appetite disorder,"to find all the studies that refer to the prevalence of EDs in children until July 23, 2024 to obtain and perform further evaluations. After data extraction, their analysis was done by Comprehensive Meta-Analysis software (Version 2); Random effects model was used for analysis and I<sup>2</sup> index was also used to check the heterogeneity of studies.

**Results** Based on the global prevalence of EDs in children based on meta-analysis was 1% (95% CI: 0.6–1.6); Subgroup analysis based on the study of eating disorders in children showed that the prevalence of pica among children is 2.1% (95% CI: 1–4.6), the prevalence of binge eating disorder is 1% (95% CI: 0.6–1.8), and the prevalence of anorexia nervosa and Bulimia nervosa among children is 0.6% (95% Cl: 0.01–34.4) and 0.1% (95% Cl: 0–0.4), respectively.

**Conclusion** Considering the importance of nutrition in children and the report of EDs among them, healthcare workers and medical personnel must pay attention to this category of disorders by timely informing parents to reduce the complications caused by it.

Keywords Prevalence, Eating disorder, Eating problem, Children, Meta-analysis

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# Background

Eating disorders (EDs) are a group of psychological disorders characterized by changes in food consumption or the development of inappropriate eating behaviours [1, 2]. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM- 5), EDs include several types such as anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), pica, avoidant/restrictive food intake disorder (ARFID), among others [1, 3]. Although the etiology of these disorders is unknown [4], it has been proven in various studies that genetic, environmental, social factors, psychological problems (anxiety and stress), etc. can play a role in their occurrence [4–7].

Studies indicate that these disorders affect approximately 3% of children [4]. In one of the related studies, the prevalence of BED among children in the United States was reported as 0.66% [7] and in another study conducted among Egyptian children, the prevalence of AN, BED, and pica was found to be 0.6%, 5.7%, and 0.2%, respectively [6].

EDs are complex disorders that can leave adverse effects among sufferers [2, 4]; These disorders can contribute to the development of other health issues, such as heart problems, increased blood pressure, weight gain, etc. among the affected [8] and thus disturb the physical and mental health of affected children [4]. Also, some types of EDs such as AN can play a role in the occurrence of malnutrition and related symptoms [2]. However, other types of these disorders, such as pica disorder, can endanger the child's growth and development pattern or cause mental problems and cause many infectious, digestive and blood problems, all of which can reduce the quality of life and increase the risk of mortality [9–13].

The epidemiological study of this disorder shows that its prevalence is increasing worldwide. Reports show that between 2000 and 2018, its prevalence in the general population worldwide more than doubled, increasing from 3.4% to 7.8% [10]. In 2023, a systematic review and meta-analysis reported that the global prevalence of eating disorders in children and adolescents was 22.3% during 1999–2022 [11].

Health reports conducted in the United States between 2018 and 2022 show that health visits related to eating disorders among children under 17 years of age more than doubled, while health visits for all eating disorders in this age group increased by 107.4%, from about 50,000 visits in early 2018 to more than 100,000 visits in 2022 [14]. In France, the incidence of eating disorders among schoolchildren has also been reported to have doubled between 2009 and 2021, from 24% in 2009 to 46.6% in 2021 [15].

Considering the unpleasant complications that EDs create among children and the varying reports of different types of EDs among children in various studies, to conducting a meta-analysis and systematic review related to reporting a unified prevalence rate of different types of EDs among the child age group is crucial. Therefore, the aim of this research is to determine the global prevalence of EDs among children.

# Methods

The present systematic review and meta-analysis was conducted in accordance with PRISMA guidelines to assess the global prevalence of EDs in children. A protocol has not been prepared for this study. For this purpose, a systematic search was conducted in databases including PubMed, Web of Science, Scopus, ScienceDirect, Embase, and Google Scholar using relevant keywords ("prevalence,""eating disorder,""feeding disorder,"eating problem,"appetite disorder,"combined with Boolean operators OR and AND) on July 23, 2024, without any restrictions on the year of publication. All the related studies published by the mentioned date, including those identified through manual searches, were added into information management software, EndNote, for further evaluation.

Relevant keywords were considered based on the PICO criteria. Population (P) was children in the world, Intervention (I): no intervention, Comparison (C): comparison with children who did not report eating disorders. Outcome (O) was: prevalence of eating disorders in children.

Search strategies for all databases: PubMed: (((((eating disorder [MeSH Terms]) OR ("Appetite Disorders")) OR ("Eating and Feeding Disorders")) OR ("Feeding Disorders")) AND ("Children")) AND (Prevalence).

Web of science: ALL =(eating disorder OR Appetite Disorders OR"Eating and Feeding Disorders"OR"Feeding Disorders"AND"Children"AND"Prevalence").

Scopus: TITLE-ABS- (eating disorder OR Appetite Disorders OR"Eating and Feeding Disorders"OR"Feeding Disorders"AND"Children"AND"Prevalence").

Embase: eating disorder: ti,ab,kw OR Appetite Disorders':ti,ab,kw OR'Eating and Feeding Disorders':ti,ab,kw OR'Feeding Disorders':ab,kw AND'Children':ti,ab,kw AND Prevalece:ti,ab,kw.

ScienceDirect: Title, abstract or author-specified keywords (eating disorder OR Appetite Disorders OR"Eating and Feeding Disorders"OR"Feeding Disorders"AND"Chil dren"AND"Prevalence").

# Identification of articles

#### Inclusion criteria

Studies were included in this research if they met the following criteria:

- 1. Studies that reported the prevalence of ED (EDs) or their subsets in children (according to the World Health Organization (WHO), individuals under the age of 10 are considered children; however, some related studies have considered different age ranges for children [12, 13]; and some have not specifically defined a particular age group as a child, in such cases, we used the WHO definition.
- 2. Studies published in English.
- 3. Cross-sectional and Longitudinal studies.
- 4. Case–control studies.
- 5. Cohort studies.

# Exclusion criteria

The following studies were excluded:

- 1. Case report studies.
- 2. Case series studies.
- 3. Interventional studies.
- 4. Review studies.
- 5. Animal studies.

# **Study selection**

In the present research, in the first stage, to obtain studies related to the title, all duplicate studies were removed, and the title and abstract of the remaining studies were examined and studied. According to the inclusion and exclusion criteria, all unrelated studies were excluded from the research process. In the next step, the researchers reviewed the full text of the remaining studies, and the studies that did not meet the necessary criteria for entering the research at this stage were also excluded from the research. Finally, the information obtained from the remaining studies was measured and extracted. To minimize errors and bias, all the above steps and also evaluate the methodological quality of each paper were carried out separately by two independent researchers, and if the two researchers disagreed, a third researcher performed the related evaluations.

### Qualitative evaluation of studies

The STORBE checklist is a validated tool to measure the quality of observational studies, and it has been commonly used in meta-analysis studies for quality assessment. This checklist was employed in the present study to assess the quality of the selected studies. This checklist consists of 6 scales and 32 subscales and generally evaluates the title, abstract, introduction, methods, results, and discussion of the studies. According to the mentioned checklist, the minimum and maximum points that the studies can get are 0 and 32, respectively. Studies that

have scored at least 16 points were considered of good quality, and those scoring below 16 points were excluded from the research [15].

### **Data extraction**

Two researchers extracted the required data for the checklist designed to conduct the research. Information such as the names of the authors, year of publication, location, type of study, sample size, the prevalence of EDs or their subtypes in children, mean or age range of participants, and the tools necessary to measure the status of EDs in different studies were extracted and entered into the designed checklist.

#### Statistical analysis

Data analysis was conducted using the Comprehensive Meta-Analysis software, Version 2 (Biostat, Englewood, NJ 07631, USA). The  $I^2$  index was used to evaluate the heterogeneity, and publication bias was evaluated using the Funnel plot and Egger test (at a significance level of 0.05).

# Results

In the present study, an initial systematic search was conducted in different databases and 5264 studies were obtained; Then, 4 additional studies were obtained through manual search, resulting in 5268 studies importing to the Endnote information management software. The number was reduced to 3879 studies after removing duplicate studies. Further 3810 studies were excluded due to not meeting the entry criteria, leaving 69 studies for full-text evaluation. Of these, 45 studies were excluded based on the entry and exit criteria, and 5 more were also removed due to low quality (getting a score of less than 16 in the qualitative assessment). Finally, 19 studies with 42 prevalence and scrutinized data remained and were included in the final analysis (Fig. 1).

Table 1 shows the information from studies included in this research; As shown in this table, in the study by Amos Kroos and colleagues, none of the children showed evidence of some types of EDs [16]. A study conducted by Dursun et al. among children living in Turkey shows none of the participants met the full diagnostic criteria for EDs [17]. While Lieberman et al. conducted a crosssectional study in Canada and reported the prevalence of AN among 8–13-year-old children as 72.6% [18]; the highest reported prevalence among the explored studies (Table 1).

# General characteristics of the studies

In the review of 19 studies with 42 data and verifiable prevalence according to the types of EDin children with a sample size of 448,173 children 3 to 14 years old,



Fig. 1 PRISMA flow diagram for identifying relevant studies

the examination of the I<sup>2</sup> heterogeneity test indicated high heterogeneity (I<sup>2</sup>: 99.1). Hence, the random effects method was used to analyse the results. Based on the meta-analysis, the global prevalence of EDs in children was reported as 1% (95% CI: 0.6–1.6) (Fig. 2). Further, the Egger test included studies indicated no evidence of publication bias in the studies included (p: 0.590) (Fig. 3).

In examining the factors affecting the heterogeneity of studies and investigating the effect of sample size on this heterogeneity, it was reported that with the increase in sample size, the global prevalence of EDs in children decreased (p < 0.05) (Fig. 4) and also with the rise in the year of conducting studies, the global prevalence of EDs in children also decreases (p < 0.05) (Fig. 5).

According to the results presented in Table 2, reporting the global prevalence of EDin children by type of disorder, the most reported eating disorder in children is Pica with 2.1 (95% CI: 1–4.6) and Binge Eating Disorder at 1 (95% CI: 0.6–1.8) (Table 2). In addition, according to the results presented in Table 3 reporting the global prevalence of EDin children by continent, the highest prevalence of eating disorder in children was found in Australia at 5.2 (95% CI: 2.6–10). However, it should be noted that this estimate is based on only one study conducted in Australia. Among the continents with more studies, Europe had the highest prevalence of EDs in children at 2% (95% CI: 1.2–3.3), followed by North America at 1% (95% CI: 0.4–2.2). Given the importance of eating disorders in children, we included all studies and

#### Author Year Study Type risk of bias type of instrument Age range or Prevalence Sample size Country Disorders average of EDs in children (%) Lieberman et al. 2019 Cross-sectional Low AN EDI-C<sup>a</sup> 8 to 13(11.27 72.6 106 Canada $\pm 0.9)$ [18] Lieberman et al. 2019 Cross-sectional ARFID FDI-C 8 to 13(11.27 27.4 106 Canada low [18] +0.9Mohammadi 2020 Cross-sectional AN DSM-IV K-SADS-0 9274 Iran low 6 to 9 PI <sup>b</sup> et al.[19] Mohammadi 2020 Cross-sectional ΒN DSM-IV K-SADS- 6 to 9 0.01 9274 Iran low et al.[19] ΡI Mohammadi 2020 Cross-sectional BED DSM-IV K-SADS- 6 to 9 0.05 9274 Iran low et al.[19] ΡI Mohammadi 2020 Cross-sectional Low OSFED DSM-IV K-SADS- 6 to 9 011 9274 Iran et al.[19] ΡI BORTES et al. ED ICD-10<sup>c</sup> 0.98 266,664 Sweden 2022 prospectively low [20] Allen et al.[21] 2008 population-Moderate BED ChEDEd 8 to 13 5.19 154 Australia based cohort Amos-Kroohs 2016 Cross-sectional Low Pica A 6-page ques- $9.43 \pm 0.45$ 0 81 USA et al.[16] tionnaire Amos-Kroohs 2016 Cross-sectional 81 USA low Pica A 6-page gues- $9.43 \pm 0.45$ 0 et al.[16] tionnaire Amos-Kroohs 2016 Cross-sectional ΒN A 6-page ques-0 81 USA low $9.43 \pm 0.45$ et al.[16] tionnaire Amos-Kroohs 2016 Cross-sectional AN A 6-page ques- $9.43 \pm 0.45$ 0 81 USA low et al.[16] tionnaire Convertino & Longitudinal KSADS- 5<sup>e</sup> 9 to 10 0.1 11,718 USA 2021 Low AN Blashill[22] study Convertino & 2021 Longitudinal Low ΒN KSADS- 5 9 to 10 01 11,718 USA Blashill[22] study Convertino & 2021 Longitudinal low BED KSADS-5 9 to 10 0.8 11,718 USA Blashill[22] study Convertino & 2021 Longitudinal OSFED BN KSADS-5 9 to 10 0.1 11,718 USA Low Blashill[22] study Convertino & 2021 Longitudinal Low OSFED BED KSADS-5 9 to 10 0.6 11,718 USA Blashill[22] study Hartmann et al. 2018 Cross-sectional EDY-Q<sup>f</sup> 804 Low Pica 7 to 14 4.98 Germany [12] Hartmann et al. 2018 Cross-sectional RD EDY-Q 804 Germany low 7 to 14 1.49 [12] Hartmann et al. 2018 Cross-sectional ARFID EDY-Q 804 Germany low 7 to 14 3.11 [12] ChEAT<sup>g</sup> 705 Taiwan Wong et al.[23] 2011 Prospective Moderate ED 10& 12 10.6 cohort Al Agroudi et al. 2023 case-control Low AN DSM-5 6 to 12 0.6 528 Egypt [6] Al Agroudi et al. 2023 case-control low ARFID DSM-5 6 to 12 25 528 Egypt [6] Al Agroudi et al. 2023 case-control BED DSM-5 6 to 12 528 Egypt Low 5.7 [6] Al Agroudi et al. 2023 case-control Low NES DSM-5 6 to 12 0.8 528 Egypt [<mark>6</mark>] Al Agroudi et al. 2023 case-control Low Pica DSM-5 6 to 12 0.2 528 Egypt [<mark>6</mark>] Al Agroudi et al. 2023 case-control RD DSM-5 528 Low 6 to 12 0.4 Egypt [<mark>6</mark>]

# Table 1 Summary of characteristics of included studies of prevalence of EDs in children

Author	Year	Study Type	risk of bias	type of Disorders	instrument	Age range or average	Prevalence of EDs in children (%)	Sample size	Country
Al Agroudi et al. [6]	2023	case-control	Low	OSFED	DSM- 5	6 to 12	2.9	528	Egypt
Smith & Mason[24]	2022	Cross-sectional	Low	BED	K-SADS	9 to 10	0.1	7793	US
Nagata et al.[25]	2021	Prospective cohort	Low	BED	KSADS- 5	9 to 10(9.95 ±0.63)	0.7	11,025	US
Lamerz et al.[25]	2005	cross-sectional	Low	BED	DSM-IV	5 to7(5.8 ± 4)	2	1979	Germany
Lamerz et al.[25]	2005	cross-sectional	Low	NES	DSM-IV	5 to7(5.8 ± 4)	1.1	1979	Germany
Papini et al.[26]	2024	Longitudinal	Moderate	Pica	Asking related questions to the mother	3	2.29	9881	UK
Smith et al.[27]	2023	Prospective cohort	Low	BED	KSADS- 5	9 to 10	0.8	9438	US
Smith et al.[27]	2023	Prospective cohort	Low	SBED	KSADS- 5	9 to 10	0.6	9438	US
Olfson et al.[7]	2023	Cross-sectional	Low	BED	KSADS for DSM- 5	9 to 10	0.66	11,874	US
Olfson et al.[7]	2023	Cross-sectional	Low	OED	KSADS for DSM- 5	9 to 10	0.07	11,874	US
Ayaz et al.[28]	2012	Cross-sectional	Low	ED	ECI- 4 <sup>h</sup>	3 to5	2.9	34	Turkey
Shapiro et al. [29]	2007	Cross-sectional	Low	BED	C-BEDS <sup>i</sup> &SCID <sup>i</sup>	5 to 13(8.7 ±2.2)	9	55	US
Shapiro et al. [29]	2007	Cross-sectional	Low	SBED	C-BEDS&SCID	5 to 13(8.7 ±2.2)	22	55	US
Dursun et al.[17]	2020	Cross-sectional	Low	ED	DAWBA <sup>k</sup>	8.23 ±0.77	0	1080	Turkey
Dursun et al.[17]	2020	Cross-sectional	Low	SED	DAWBA	8.23 ±0.77	0.1	1080	Turkey
Chong et al.[13]	2017	Cross-sectional	Low	ED	ChEAT	10 to 11	30.8	816	Malaysi

Anorexia Nervosa, ARFID Avoidant Restrictive Food Intake Disorder, BN Bulimia Nervosa, BED binge-eating Disorder, OS FED Other specified feeding and ED, RD Rumination disorder, NES Night eating syndrome, SBED Subthreshold Binge eating disorder, SED Subthreshold ED, OED other EDs

<sup>a</sup> Eating disorders inventory for children

<sup>b</sup> Kiddie-Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version

<sup>c</sup> the 10 th revision of the International Statistical Classification of Diseases and Related Health Problems

<sup>d</sup> The Child Eating Disorder Examination

<sup>e</sup> the Kiddie Schedule for Affective Disorders and Schizophrenia

<sup>f</sup> Eating Disorders in Youth-Questionnaire

<sup>g</sup> Children's Eating Attitudes Test

<sup>h</sup> Early Childhood Inventory- 4

<sup>i</sup> the Children's Binge Eating Disorder Scale

<sup>j</sup> the Structured Clinical Interview for the Diagnosis of DSM-IV Disorders

<sup>k</sup> The researchers used the Development and Well-Being Assessment

methods of studies in this field, including cross-sectional, prospective cohort, longitudinal study, and case–control, in the analysis because we did not want to miss any study. However, including these studies will cause heterogeneity of results, because the method, structure, and sampling methods of these studies are different. Cross-sectional studies are population-based, case–control studies include two groups: case and control, and cohort studies include two groups: exposed and unexposed. Therefore, such a process in the methodology of studies can cause heterogeneity of prevalence results. Therefore, metaregression was used for the study, and meta-analysis was conducted based on each type of study separately. In subgroup analysis based on study design, the highest prevalence was reported in case–control and cohort studies with prevalence's of 1.3 (95%CI: 0.6–2.8) and 1.3 (95%CI: 0.6–2.9), respectively. Also, in the population-based cohort study design, there was only one study [21], which did not allow for meta-analysis for one study (Table 3).

# Meta Analysis



Fig. 2 Forest plot of the global prevalence of eds in children based on the random-effects model

# Discussion

The global prevalence of EDs in children was estimated to be 1% in the current meta-analysis and systematic review investigation, which was carried out to ascertain this prevalence; Additionally, because there are numerous varieties of these diseases, the prevalence of each form of ED was determined independently among the children in this study. As a result, the global prevalence of AN, BN, BED, and Pica among children was 0.6%, 0.1%, 1%, and 2.1% respectively.

As mentioned, EDs are known worldwide as a category of psychiatric disorders with significant impact, usually appearing during adolescence [3, 30]. However, this category of disorders has also affected children's age groups



Funnel Plot of Standard Error by Logit event rate

Fig. 3 Funnel plot assessing publication bias in the reviewed studies



Fig. 4 Meta-regression of sample size's impact on global prevalence of EDs in children

in recent years [3]. As in many recently published studies, they have mentioned the prevalence of some types of EDS among children [7, 24, 27].

For example, Bortes et al. conducted a related study in Switzerland and reported the prevalence of EDs among children to be 0.98% [20]. In the study of Convertino and Blashill, conducted in the USA, the prevalence of different types of EDs was calculated separately, and the prevalence of BN and BED in children was 0.1% and 0.8%, respectively [22]. Also, in other related studies, the prevalence of AN in Egyptian children is 0.6% and the prevalence of BED in American children is 0.8% [6, 27]. In a cross-sectional study by Olfson et al., 0.66% of 9–10-year-old children met the diagnostic criteria of BED [7]. In another study conducted in the UK, 2.29% of 3-year-old children showed symptoms based on Pica [26]. These findings are in line with the results of the current study.

However, some studies reported much higher prevalence rates for EDs, or specific types compared to the results of this study [13, 18, 21, 23]. For example, in Chong et al.'s study, EDs were observed among 30.8%



Regression of Years on Logit event rate

Fig. 5 Meta-regression of the impact of study year on the global prevalence of EDs in children

Table 2	Global	prevalence	of EDs in	children	bv tv	pe of d	isorde
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Type of eating disorder	Ν	Sample size	l <sup>2</sup>	Egger test	Prevalence (95% CI)
Anorexia nervosa	5	21,707	99.2	0.448	0.6 (95%Cl: 0.01-34.4)
Bulimia nervosa	3	21,073	69.3	0.883	0.1 (95%CI: 0-0.4)
Binge eating disorder	10	63,838	96.6	0.676	1 (95%Cl: 0.6-1.8)
Pica	4	11,294	89.6	0.884	2.1 (95%Cl: 1-4.6)

Table 3 Global prevalence of EDs in children by continent and study design

Sub-group		N	Sample size	l <sup>2</sup>	Egger test	Prevalence (95% Cl)	
Continent (geographic variations)	Europe	7	282,915	97.9	0.059	2 (95%Cl: 1.2-3.3)	
	Asia	16	44,507	98.4	0.0001	0.6 (95%Cl: 0.2-1.6)	
	America	18	120,597	98.7	0.754	1 (95%Cl: 0.4-2.2)	
	Australia	1	154	0	-	5.2 (95%Cl: 2.6-10)	
Study design	Cross-sectional	23	78,582	99.03	0.043	1 (95%Cl: 0.4-2.7)	
	Prospective cohort	5	297,270	99.08	0.658	1.3 (95%Cl: 0.6-2.9)	
	Longitudinal study	6	68,571	98.6	0.003	0.3 (95%Cl: 0.1-0.8)	
	case-control	7	3696	86.9	0.0004	1.3 (95%CI: 0.6-2.8)	

of children [13] and in another study conducted among Taiwanese children, 10.6% of children were identified as having EDs [23]. In the study of Lieberman et al., the prevalence of AN in Canadian children was reported as 72.6% [18], in other related studies, 5.7% of Egyptian children and 5.19% of children living in Australia are known as BED [6, 21].

However, in a cross-sectional study conducted in Turkey by Dursun et al.'s, none of the children participating in the research fully met the diagnostic criteria of EDs [17]. In Mohammadi et al.'s study, which was conducted in Iran, only 0.01% of children aged 6 to 9 years were diagnosed with BN [19]. Also, in another related study, which investigated the prevalence of pica, 0.2% of children showed symptoms of pica [6], and these values are very small compared to the results of the present study and many other studies.

the occurrence and persistence of EDs are affected by many factors, which has turned it into a very complex disorder [9]. Evidence suggests that genetics and psychological and social factors can be effective in creating this category of disorders [9]; In addition to individual

factors, parents' personality traits or their dietary styles can also affect children's eating behaviours [4, 6]. Also, many environmental factors such as traumas and accidents experienced in children can also be considered as a risk factor for developing EDs [31] in the reviewed studies, and these diverse factors might explain the variation in reported prevalence rates.

In this study, the highest prevalence of EDs was observed primarily in children from Australia, followed by Europe, and the lowest prevalence was among children from the continent of Asia; Considering that studies have pointed out the role of dietary styles of parents and those around them in the occurrence of inappropriate eating behaviours [4, 6], this issue can be influenced by the difference in dietary styles and types of nutrition of children or parents and their peers in geographically different regions. Also, the impact of diets and the influence of different trends in the relationship between specific types of dietary practices and eating disorder behaviors among girls, women, boys, and men have been reported [32]. Also, the development of urbanization and the excessive use of media and social networks can have a great impact on eating disorders in children and different regions based on this development. In a report, the importance of unhealthy eating behaviors caused by these media has been emphasized [33].

# Limitations and recommendations

One of the main limitations of this study was the high heterogeneity of studies in terms of age groups. Many studies that did not differentiate between children and teenagers were excluded because they were pooled, leaving out many relevant studies. Another limitation is the small sample sizes and non-random sampling in many studies. In addition, the lack of studies conducted on some continents (like the continents of Africa and Australia) shows the necessity of conducting more related research in different places. It is recommended that future meta-analysis studies focus on examining the long-term consequences of this disorder, such as health and physical and mental development, in order to obtain new dimensions of this disorder.

# Conclusion

Considering the prevalence of EDs among children and the range of forms they can take, the findings of this study offer valuable insights for health policymakers to act in raising awareness among caregivers and parents; helping parents with early detection and intervention to mitigate the onset and development of Eds and the longterm health difficulties linked with ED. The necessary training to raise awareness among families can be considered by health policymakers through social media so that by providing early diagnostic guidance to families, they can be informed through the recognition of early symptoms in children, and families can provide the basis for reducing the consequences of this disorder by visiting a doctor early. Attention to regional inequalities through the World Health Organization's structures can be considered in terms of paying attention to different regions based on the economic and social situation in less-privileged areas, as well as paying attention to increasing awareness in more-privileged areas.

# Abbreviations

FD

Eating disorders DSM-5 Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

AN Anorexia Nervosa

RΝ Bulimia Nervosa

BED Binge Eating Disorder

ARFID Avoidant/Restrictive Food Intake Disorder

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#### Authors' contributions

NS and PH and MM2 contributed to the design, MM2 statistical analysis, participated in most of the study steps. MM2 and AD and ZC and MJT and MM1 prepared the manuscript. MM1 and MM2, PH and MN and MJT and SHF and SHSH assisted in designing the study, and helped in the interpretation of the study. All authors have read and approved the content of the manuscript.

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#### Data availability

Datasets are available through the corresponding author upon reasonable reauest.

#### Declarations

#### Ethics approval and consent to participate

Ethics approval was received from the ethics committee of deputy of research and technology, Kermanshah University of Medical Sciences (IR.KUMS. REC.1403.415).

#### **Consent for publication** Not applicable.

#### **Competing interests**

The authors declare that they have no conflict of interest.

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