

Evidence-Based Medicine

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Abstract

Background As the critical role of nutritional rehabilitation in the treatment of anorexia nervosa has become increasingly clear, relevant clinical guidelines in China and abroad have been continuously improved and updated, providing important references for clinical practice. However, the quality of existing guidelines varies, making it necessary to conduct a systematic evaluation to promote more scientific and standardized clinical practice. **Objective** To systematically evaluate guidelines related to nutritional rehabilitation for patients with anorexia nervosa, analyze the similarities and differences among their recommendations, and provide an evidence-based basis for clinical decision-making. **Methods** PubMed, Embase, CINAHL, Web of Science, Wanfang Data Knowledge Service Platform, China National Knowledge Infrastructure, Chinese Biomedical Literature Database, VIP Database, Guidelines International Network, the website of the National Institute for Health and Care Excellence, the National Guideline Clearinghouse, the Registered Nurses' Association of Ontario website, the Scottish Intercollegiate Guidelines Network, the Yimaitong Chinese Guidelines Network, and websites of relevant professional associations were systematically searched for guidelines related to nutritional rehabilitation in patients with anorexia nervosa. The search period was from database inception to 2025-05-31. Four researchers used the Appraisal of Guidelines for Research and Evaluation II to assess the quality of the included guidelines and summarized and analyzed their recommendations. **Results** A total of 14 guidelines were included, developed or updated between 2005 and 2023, including 5 from the United States, 3 from the United Kingdom, 2 from Scotland, 1 from Germany, 1 from France, 1 from Australia, and 1 from China. There were 11 grade A recommended guidelines and 3 grade B recommended guidelines. The relevant recommendations focused on the general principles of nutritional management, nutritional assessment and grading, nutritional rehabilitation plans (target values for weight gain, caloric intake prescriptions, micronutrients, and nutritional rehabilitation routes), complication management, and psychological interventions. **Conclusion** The overall methodological quality of guidelines related to nutritional rehabilitation in patients with anorexia nervosa is relatively high, but certain inconsistencies remain among their recommendations. It is recommended that multidisciplinary teams prudently integrate existing evidence-based evidence in clinical practice to formulate individualized nutritional rehabilitation plans for patients and facilitate their comprehensive recovery.

Full Text

Evidence-Based Medicine

Systematic Review of Guidelines for Nutritional Rehabilitation in Patients with Anorexia Nervosa

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[Abstract] Background With the increasingly apparent key role of nutritional rehabilitation in treatment for anorexia nervosa, relevant clinical guidelines at home and abroad have been continuously refined and updated, providing important references for clinical practice; however, the quality of existing guidelines varies, making it necessary to conduct a systematic review to promote more scientific and standardized clinical practice. **Objective** To systematically review guidelines related to nutritional rehabilitation in patients with anorexia nervosa, analyze similarities and differences among guideline recommendations, and provide evidence-based decision-making support for clinical practice. **Methods** PubMed, Embase, CINAHL, Web of Science, the Wanfang Data Knowledge Service Platform, CNKI, the Chinese Biomedical Literature Database, VIP, the Guidelines International Network, the website of the National Institute for Health and Care Excellence, the U.S. National Guideline Clearinghouse, the Registered Nurses' Association of Ontario website, the Scottish Intercollegiate Guidelines Network, the Chinese Medical Association guideline website, and websites of relevant professional associations were systematically searched for guidelines on nutritional rehabilitation in patients with anorexia nervosa. The search period was from database inception to 2025-05-31. Four researchers used the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument to assess the quality of included guidelines and summarized and analyzed their recommendations. **Results** A total of 14 guidelines were ultimately included, with publication or update years ranging from 2005 to 2023; among them, 5 were from the United States, 3 from the United Kingdom, 2 from Scotland, 1 from Germany, 1 from France, 1 from Australia, and 1 from

China. There were 11 grade-A recommended guidelines and 3 grade-B recommended guidelines. Related recommendations centered on general principles of nutrition management, nutritional assessment and grading, nutritional rehabilitation plans—including target values for weight gain, energy intake prescriptions, micronutrients, and routes of nutritional rehabilitation—complication management, and psychological interventions. **Conclusion** The overall methodological quality of guidelines related to nutritional rehabilitation in patients with anorexia nervosa is relatively high, but recommendations across guidelines remain somewhat inconsistent. It is recommended that multidisciplinary teams carefully integrate existing evidence-based evidence in clinical practice to develop individualized nutritional rehabilitation plans for patients and support comprehensive recovery.

[Keywords] anorexia nervosa; nutritional rehabilitation; guideline; systematic review; evidence-based medicine

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A Systematic Review of Guidelines for Nutritional Rehabilitation in Patients with Anorexia Nervosa

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[Abstract] **Background** With the increasingly recognized critical role of nutritional rehabilitation in the treatment of anorexia nervosa, relevant clinical guidelines domestically and internationally have been continuously developed and updated, providing important references for clinical practice. However, their quality varies, necessitating a systematic review to promote scientific and standardized clinical practice. **Objective** To systematically review guidelines on nutritional rehabilitation for patients with anorexia nervosa, analyze the similarities and differences in recommendations across guidelines, and provide

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evidence-based references for clinical decision-making. **Methods** Systematic searches were conducted in PubMed, Embase, CINAHL, Web of Science, Wanfang Data Knowledge Service Platform, China National Knowledge Infrastructure, Chinese Biomedical Literature Database, VIP Database, the International Guideline Collaboration website, the National Institute for Health and Care Excellence website, the National Guideline Clearinghouse, the Registered Nurses' Association of Ontario website, the Scottish Intercollegiate Guidelines Network website, the Chinese Medical Pulse guideline website, and related professional association websites for guidelines on nutritional rehabilitation for patients with anorexia nervosa. The search timeframe was from database inception to May 31, 2025. Four researchers used the Appraisal of Guidelines for Research & Evaluation Instrument to assess the quality of the guidelines and summarized and analyzed their recommendations. **Results** Fourteen guidelines were ultimately included, with publication or update dates ranging from 2005 to 2023. These included five from the United States, three from the United Kingdom, two from Scotland, and one each from Germany, France, Australia, and China. Eleven guidelines received Grade A recommendations, and three received Grade B. The relevant recommendations focused on general principles of nutritional management, nutritional assessment and staging, nutritional rehabilitation plans (target weight gain, caloric intake prescription, micronutrients, nutritional rehabilitation pathways), complication management, and psychological intervention. **Conclusion** The methodological quality of guidelines on nutritional rehabilitation for patients with anorexia nervosa is relatively high. However, inconsistencies in recommendations exist among different guidelines. It is recommended that multidisciplinary teams in clinical practice carefully integrate existing evidence to develop individualized nutritional rehabilitation plans for patients to promote their comprehensive recovery.

[Key words] Anorexia nervosa; Nutritional rehabilitation; Guidelines; Systematic review; Evidence-based medicine

Anorexia nervosa is a type of eating disorder characterized mainly by self-imposed dietary restriction, marked weight loss, and malnutrition, and is most

commonly seen in adolescent females^[1]. The number of outpatient visits for eating disorders in China has approached 3,000 person-visits, among which anorexia nervosa accounts for 63.6%^[2]. Malnutrition caused by excessive dieting can lead to multiple somatic complications, such as gastroduodenal ulcers, bradycardia, and osteoporosis^[3]; in severe cases, patients may die from multiple-organ failure. Other studies have shown that patients with anorexia nervosa often have comorbid psychological disorders such as depression and anxiety, which may be directly related to neuroendocrine disturbances caused by malnutrition^[4-5]. Therefore, several international authoritative organizations, including the American Psychiatric Association^[6], the Academy for Eating Disorders^[7], and the National Institute for Health and Care Excellence^[8], all regard nutritional rehabilitation as the most fundamental and critical intervention for patients with anorexia nervosa. Its purpose is to help patients restore normal body weight and stabilize their physical condition, while also reversing the various physical and psychological complications secondary to low body weight^[9]. At present, no unified, evidence-based, standardized nutritional rehabilitation protocol has yet been established internationally^[10], and the relevant recommendations on nutritional rehabilitation in existing guidelines are scattered, which is not conducive to clinical decision-making by healthcare professionals. Therefore, this study used the Appraisal of Guidelines for Research and Evaluation (AGREE)^[11] to evaluate the methodological quality of domestic and international guidelines related to nutritional rehabilitation for patients with anorexia nervosa, and to integrate and organize the recommendations from each guideline, with the aim of providing evidence-based references for nutritional rehabilitation work for patients with anorexia nervosa in China.

1 Materials and Methods

This systematic review has been registered on the International Prospective Register of Systematic Reviews (PROSPERO), registration number: CRD420261355871.

1.1 Literature search strategy

A systematic search was conducted of domestic and international guideline websites, professional association websites, and databases. Among them, guideline websites included the Guidelines International Network, the National Institute for Health and Care Excellence (NICE) website, the National Guideline Clearinghouse, the Registered Nurses' Association of Ontario website, the Scottish Intercollegiate Guidelines Network, and the Chinese Yimaitong guideline website. Professional association websites included those of the American Psychiatric Association, the Academy for Eating Disorders, the International Eating Disorder Collaboration, the World Federation of Societies of Biological Psychiatry, the Royal Australian and New Zealand College of Psychiatrists, the American Academy of Pediatrics, the American Academy of Child and Adolescent Psychiatry, the Royal College of Psychiatrists, the New South Wales Ministry of Health,

the Scottish Quality Improvement Centre website, and the French Federation for Anorexia and Bulimia. Databases included PubMed, Embase, CINAHL, Web of Science, Wanfang Data Knowledge Service Platform, China National Knowledge Infrastructure, Chinese Biomedical Literature Database, and VIP. The English search terms were “eating disorders/anorexia nervosa,” “nutrition/nutritional reconstruction/nutritional therapy/nutritional rehabilitation/nutritional management,” and “guideline/*standard*/consensus/recommendation*.” The Chinese search terms were “进食障碍 / 喂养及进食障碍 / 神经性厌食 / 厌食症,” “营养 / 营养重建 / 营养治疗 / 营养康复 / 营养管理,” and “指南 / 规范 / 标准 / 共识.” The search period was from database inception to 2025-05-31. Taking PubMed as an example, the search strategy is shown in Table 1.

1.2 Literature inclusion and exclusion criteria

Inclusion criteria: (1) guidelines related to anorexia nervosa that were publicly published domestically or internationally and whose content covered relevant recommendations on nutritional rehabilitation; (2) no restriction on the guideline development method, with both evidence-based guidelines and non-evidence-based guidelines included^[12-13]; (3) languages were Chinese or English. Exclusion criteria: (1) duplicate records or guidelines that had been updated; (2) guideline interpretations, translations, or post-publication evaluations; (3) brief versions containing only tables of contents, abstracts, or recommendations, or partial content from guidelines; (4) guidelines for which the full text could not be obtained.

Table 1 Search strategy of PubMed

Step	Search strategy
#1	anorexia nervosa <i>MeSHTerms</i> OR eating disorders <i>Title/Abstract</i> OR anorexia nervosa <i>Title/Abstract</i>
#2	nutrition <i>Title/Abstract</i> OR nutritional reconstruction <i>Title/Abstract</i> OR nutritional therapy <i>Title/Abstract</i> OR nutritional rehabilitation <i>Title/Abstract</i> OR nutritional management <i>Title/Abstract</i>
#3	guideline* <i>Title/Abstract</i> OR standard* <i>Title/Abstract</i> OR consensus <i>Title/Abstract</i> OR recommendation* <i>Title/Abstract</i>
#4	#1 AND #2 AND #3

1.3 Literature Screening and Data Extraction

Two researchers who had received standardized training in evidence-based methodology systematically searched the literature. After importing the records into NoteExpress software and removing duplicates, they independently screened titles and abstracts according to the inclusion and exclusion criteria for the preliminary screening, and then read the full texts for rescreening. For the included literature, data were extracted using specially designed forms for basic guideline information and guideline content, followed by cross-checking. In the event of disagreement, the researchers discussed the issue jointly or consulted a senior member of the research team for adjudication. For the included literature, data were extracted using a predesigned basic guideline information extraction form, including guideline title, publication time, country, publishing organization, intended users, version, and other items.

1.4 Quality Appraisal of the Included Guidelines

1.4.1 Appraisal Tool The AGREE II instrument was used for quality appraisal of the literature. Four researchers performed the appraisal independently, and all four had received training in the AGREE II scoring criteria. Before the formal appraisal, five included guidelines were randomly selected for pre-appraisal, and the intraclass correlation coefficient (*ICC*) was used to test the consistency of the pre-appraisal results among the four researchers. The results showed that all *ICC* values were > 0.75 , indicating good consistency [14]. On this basis, the four researchers independently scored the guidelines according to the six domains of AGREE II—scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence—comprising a total of 23 items. Each item was scored from 1 to 7, where 1 indicated complete nonconformity and 7 indicated complete conformity. Standardized scores for each domain were calculated as follows: standardized score =

$$(actualscore - minimumpossiblescore) / (maximumpossiblescore - minimumpossiblescore)$$

$\times 100\%$; a higher score indicated higher quality in that domain. Based on the standardized scores in each domain, the recommendations for guidelines were classified into three grades: guidelines with scores $\geq 50\%$ in ≥ 4 domains were actively recommended and rated grade A; those with scores $\geq 50\%$ in 3 domains were recommended and rated grade B; and those with scores $\geq 50\%$ in ≤ 2 domains could be recommended under certain conditions and were rated grade C [15].

1.4.2 Statistical Methods SPSS 26.0 software was used for statistical analysis. The *ICC* was used to test the consistency of the four researchers' appraisal of guideline quality. An *ICC* < 0.40 indicated poor consistency, $0.40 \leq ICC < 0.75$ indicated moderate consistency, and *ICC* ≥ 0.75 indicated high consistency [14]. At the same time, the mean ($\bar{x}$) and standard deviation (s) of the

standardized scores in each domain of the included guidelines were calculated to describe the overall average quality level and dispersion of scores in that domain. The coefficient of variation (CV) was used to quantify heterogeneity in recommendations across different guidelines, with $CV = (\text{standard deviation}/\text{mean}) \times 100\%$. A $CV < 15\%$ indicated extremely high consistency of recommendations, whereas $CV \geq 30\%$ suggested a high degree of heterogeneity in recommendations [16].

1.5 Extraction and Integration of Recommendations

Two researchers used a unified recommendation extraction form to independently extract, translate, and organize the content, direction, strength, and supporting evidence quality of recommendations related to nutritional rehabilitation for patients with anorexia nervosa in the guidelines. Recommendations that were identical or similar were then integrated.

1.6 Grading of Evidence Quality and Recommendation Strength

The researchers referred to the original evidence-quality grading and recommendation-strength systems used in each guideline and applied the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system to grade the evidence quality and recommendation strength of recommendations related to nutritional rehabilitation for patients with anorexia nervosa in the guidelines [17]. This system classifies recommendation strength as strong recommendation (grade I) and weak recommendation (grade II), and classifies evidence quality from high to low into four levels: A for high-quality evidence, B for moderate-quality evidence, C for low-quality evidence, and D for very low-quality evidence.

2 Results

2.1 Literature Search Results

A total of 1,314 records were initially retrieved, including 123 Chinese-language records and 1,191 English-language records. After removing 41 duplicates, 1,241 records that clearly did not meet the criteria were excluded by reviewing titles and abstracts. Based on the inclusion and exclusion criteria, 18 records were excluded after full-text review, and 14 guidelines were ultimately included. The literature screening process is shown in Figure 1.

2.2 Basic Characteristics of the Included Guidelines

A total of 14 guidelines were included in this study [6-8,18-28]. Their formulation or update years ranged from 2005 to 2023, and four guidelines [6-7,18-19] had been published within the past five years. Two guidelines [6,8] used the GRADE system for evidence-quality grading and recommendation-strength grading; one guideline [23] proposed recommendations for best assessment and

treatment practices based on the strength of basic experiential and/or clinical support; and three guidelines [22,25,27] were based on the evidence-grading systems of the Oxford Centre for Evidence-Based Medicine, the U.S. National Health and Medical Research Council, and NICE, respectively. The basic characteristics of the included guidelines are shown in Table 2.

2.3 Quality Appraisal Results of the Included Guidelines

The *ICC* values for the appraisal of the 14 guidelines by the four researchers ranged from 0.75 to 0.968, all ≥ 0.75 , indicating good consistency. Among the included guidelines, 11 were grade A and 3 were grade B. The specific appraisal results are shown in Table 3.

2.4 Summary of Main Recommendations

The recommendations summarized in this study included five aspects: general principles of nutrition management, nutrition assessment and grading, nutritional rehabilitation plans, complication management, and psychological intervention.

- **Records retrieved in total ($n = 1314$):**

1. **Guideline-related websites ($n = 26$):** Guidelines International Network ($n = 0$), National Institute for Health and Care Excellence website ($n = 2$), National Guideline Clearinghouse ($n = 5$), Registered Nurses' Association of Ontario website ($n = 3$), Scottish Intercollegiate Guidelines Network ($n = 2$), China Medlive Guideline Network ($n = 14$).
2. **Professional association websites ($n = 571$):** American Psychiatric Association ($n = 1$), Academy for Eating Disorders ($n = 21$), International Collaboration on Eating Disorders ($n = 22$), World Federation of Societies of Biological Psychiatry ($n = 2$), Royal Australian and New Zealand College of Psychiatrists ($n = 8$), American Academy of Pediatrics ($n = 381$), American Academy of Child and Adolescent Psychiatry ($n = 36$), Royal College of Psychiatrists ($n = 48$), New South Wales Ministry of Health ($n = 2$), Scottish Intercollegiate Guidelines Network / Quality Improvement Centre website ($n = 17$), French Federation for Anorexia and Bulimia ($n = 33$).
3. **Databases ($n = 717$):** PubMed ($n = 293$), Embase ($n = 127$), CINAHL ($n = 91$), Web of Science ($n = 83$), Wanfang Data Knowledge Service Platform ($n = 35$), CNKI ($n = 24$), Chinese Biomedical Literature Database ($n = 54$), VIP Database ($n = 10$).

- ↓ **Records obtained after deduplication ($n = 1273$)**

→ **Excluded after reading titles and abstracts ($n = 1241$):** non-guideline articles ($n = 592$); study content inconsistent with the topic ($n = 643$); not Chinese- or English-language literature ($n = 6$).

↓ **Records obtained** ($n = 32$)

→ **Excluded** ($n = 18$): outdated guidelines ($n = 5$); not Chinese- or English-language literature ($n = 4$); no recommendations related to nutritional rehabilitation.

↓ **Guidelines finally included** ($n = 14$)

Figure 1 Flow chart of literature screening

In these aspects, there were 91 items in total. The extracted recommendations were summarized and organized; after duplicates were removed and items were merged, 30 recommendations were ultimately obtained. The researchers uniformly graded the quality of evidence and strength of recommendations in the guidelines according to the GRADE system, as shown in Table 4.

2.5 Heterogeneity Analysis of Recommendations

This study selected weekly target weight gain and initial caloric prescription as key indicators and used *CV* to assess their heterogeneity. The results showed that, in terms of weekly target weight gain, there was high heterogeneity among guidelines. For inpatients, the recommended weekly target weight gain ranged from 0.5 to 2.0 kg/week [6–7, 24, 26, 28], with a *CV* of 33.2%; for outpatients, the differences in recommendations were even more pronounced, with the *CV* reaching 38.1%. Some guidelines recommended values as low as below 0.5 kg/week [28], whereas another guideline recommended 1.0 kg/week [26], suggesting substantial divergence in clinical practice regarding expectations for the rate of weight gain. By contrast, recommendations for the initial caloric intake prescription were highly consistent. Although some guidelines provided stratified recommendations according to the severity of malnutrition—for example, 1 000–1 880 kcal/d [20]—the overall dispersion of the data was low, with a *CV* of only 5.5%, indicating that the guidelines had reached broad consensus on the baseline for initial energy provision (Table 5).

3 Discussion

3.1 Overall Quality of the Guidelines

The 14 guidelines included in this study were of relatively high overall quality. In the AGREE II appraisal results, 11 guidelines were rated as grade A recommendations and 3 guidelines as grade B recommendations. Among the domains, scope and purpose, clarity, and independence scored relatively high, whereas rigor, applicability, and stakeholder involvement scored relatively low. In the rigor domain, 5 guidelines [7, 19–20, 24, 28] scored <50%. Some guidelines, such as the guideline on nutritional therapy for eating disorders [20], did not provide a systematic evidence-search method and did not clearly describe the strength and limitations of the evidence or the method used to formulate recommendations. As a result, their recommendations—such as an initial caloric prescription

of 1 000–1 200 kcal/d—differed significantly from those of other guidelines. In the applicability domain, 4 guidelines [7, 19–20, 24] scored <50%. Some guidelines did not clearly describe facilitators and barriers—especially barriers—during guideline implementation, or the relevant resources available for clinical use. In the stakeholder involvement domain, some guidelines [7, 19] did not incorporate patients’ perspectives and preferences during development. Therefore, when developing or updating guidelines related to nutritional rehabilitation for anorexia nervosa in the future, guideline development groups should practice a “patient-centered” philosophy and regard patients’ subjective preferences and wishes as a core logic of guideline development. Systematic, scientific, and reproducible evidence-search strategies should be provided; consideration may be given to extracting the evidence content and recommendations into a summary table, so as to present the correspondence between evidence and recommendations in a structured and visual form, thereby improving the rigor of guideline development. In addition, potential barriers during guideline implementation should be analyzed in depth, and practical and feasible resources should be provided for clinical practice, so that guidelines can truly and effectively serve the clinic.

3.2 General Principles of Nutritional Management

Clinical guidelines generally recommend adopting a multidisciplinary collaborative model to promote nutritional rehabilitation in patients with anorexia nervosa. Existing studies have confirmed that this model can simultaneously improve patients’ BMI and psychological health [29]. The American Psychiatric Association further emphasizes that multidisciplinary collaboration should run through the entire course of patient treatment [6]. Specifically, psychiatrists serve as the core hub of the team and are responsible for leading the formulation and dynamic adjustment of nutritional rehabilitation plans; registered dietitians collaborate with physicians to tailor individualized, progressive nutritional rehabilitation plans for patients; and psychiatric nurses serve as a bridge for communication and coordination within the team. By continuously monitoring key indicators such as patients’ body weight, vital signs, and eating adherence, they ensure effective advancement of the nutritional rehabilitation process and continuity of treatment. Therefore, psychiatric specialty medical institutions in China may, on the basis of drawing on the core concept of multidisciplinary collaboration and considering the characteristics of psychiatric resource allocation in China, explore nutritional management models suited to local clinical practice.

3.3 Nutritional Assessment and Grading

Nutritional assessment is the primary step in nutritional rehabilitation for patients with anorexia nervosa. Assessment tools currently used in China and abroad include the 24-hour dietary recall method (24-h dietary recall, 24 hDR) [30], Nutritional Risk Screening 2002 (nutritional risk screening 2002, NRS-2002) [31], and body-weight-related indicators [32], which lack comprehensiveness and

specificity. In terms of assessment content, guidelines generally recommend covering changes in patients' intake and dietary patterns, restrictions on specific foods or food groups, current body mass index, electrolytes, liver and kidney function, and other objective physiological indicators, and they emphasize that graded nutritional management should be implemented based on assessment results. However, different guidelines show certain differences in nutritional grading criteria: the Royal College of Psychiatrists in the United Kingdom uses only BMI as a single...

Table 2 Basic characteristics of included guidelines (n=14)

Guideline name	Publication year	Version	Country (region)	Issuing organization	Evidence grading system	Pages
G1 Practice Guideline for the Treatment of Patients with Eating Disorders, Fourth Edition [6]	2023	Updated edition	United States	American Psychiatric Association	Clinicians (practitioners) GRADE	112
G2 Eating Disorders [18]	2022	Updated edition	Scotland	Scottish Intercollegiate Guidelines Network	Primary, — secondary, and tertiary health-care professionals	86

Guideline name	Publication year	Version	Country (region)	Issuing organization	Guideline users	Evidence grading system	Pages
G3 Eating Disorders: Guidelines for Medical Care [7]	2021	Updated edition	United States	Eating Disorders Society	Professional health-care practitioners		26
G4 Identification and Management of Eating Disorders in Children and Adolescents [19]	2021	First edition	United States	American Academy of Pediatrics	Pediatricians		25

Guideline name	Publication year	Version	Country (re-gion)	Issuing organization	Guideline users	Evidence grading system	Pages
G5 Eating Disorders: Recognition and Treatment [8]	2020	Updated edition	United Kingdom	National Institute for Health and Clinical Excellence	Health-care professionals; other professionals providing public services for eating disorders (including those in education and criminal-justice institutions); people with suspected or diagnosed eating disorders and their families and carers	GRADE	45

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Guideline name	Publication year	Version	Country (region)	Issuing organization	Guideline users	Evidence grad- ing system	Pages
G6 Guide- lines for Nutri- tional Treat- ment of Eating Disor- ders [20]	2020	First edition	United States	Eating Disor- ders Soci- ety	Clinicians— in mul- tidisci- plinary teams who pro- vide nutri- tional inter- ven- tions, or per- sons other- wise in- volved in the care of these pa- tients		63
G7 Man- age- ment of Severely Ill Pa- tients with Anorexia Ner- vosa [21]	2019	Updated edition	United King- dom	Royal Col- lege of Psy- chia- trists	Clinicians—		60

Guideline name	Publication year	Version	Country (re-gion)	Issuing organization	Guideline users	Evidence grad-ing system	Pages
G8 Diag-nosis and Treat-ment of Eating Disor-ders [22]	2018	Updated edition	Germany	Association of the Scien-tific Medi-cal Soci-eties in Ger-many	Health-care profes-sionals	Oxford Centre for Evidence-Based Medicine	447
G9 Prac-tice Pa-rame-ter for the Assess-ment and Treat-ment of Chil-dren and Ado-les-cents with Eating Disor-ders [23]	2015	First edition	United States	American Academy of Child and Ado-lescent Psy-chia-try	Child psychiatrists, other medi-cal and mental-health profes-sionals	Recommendations for best assess-ment and treat-ment prac-tices based on the strength of foun-da-tional empiri-cal and/or clini-cal sup-port	14

Guideline name	Publication year	Version	Country (re-gion)	Issuing organization	Guideline users	Evidence grad-ing system	Pages
G10 Chi- nese Guide- line for the Pre- ven- tion and Treat- ment of Eating Disor- ders [24]	2015	First edition	China	Medlive Guide- lines Net- work of China	Clinical work- ers	—	181
G11 Clini- cal Prac- tice Guide- line for the Treat- ment of Eating Disor- ders [25]	2014	Updated edition	Australia	Royal Aus- tralian and New Zealand Col- lege of Psy- chia- trists	Psychiatrists and other health profes- sionals	Evidence- based grad- ing system of the U.S. Na- tional Health and Medi- cal Re- search Coun- cil	62

Guideline name	Publication year	Version	Country (region)	Issuing organization	Guideline users	Evidence grading system	Pages
G12 Anorexia Nervosa: Management [26]	2010	First edition	France	French Association for the Development of Eating Disorder Professionals	All health-care professionals and social workers who may participate in caring for patients with anorexia nervosa	—	36
G13 Recommendations for the Management and Treatment of Eating Disorders in Scotland [27]	2006	First edition	Scotland	Scottish Quality Improvement Centre	Health-care professionals	NICE evidence grading system	52

Guideline name	Publication year	Version	Country (region)	Issuing organization	Evidence grading system	Pages
G14 Guidelines for the Nutritional Management of Anorexia Nervosa [28]	2005	First edition	United Kingdom	Royal College of Psychiatrists	Clinicians—	42

Note: GRADE = Grading of Recommendations Assessment, Development and Evaluation; NICE = National Institute for Health and Clinical Excellence; — indicates that the original literature did not specify.

Table 3 Results of quality evaluation of included guidelines (n=14)

Guideline name | Standardized domain score (%) —Scope and purpose | Standardized domain score (%) —Stakeholder involvement | Standardized domain score (%) —Rigor of development | Standardized domain score (%) —Clarity of presentation | Standardized domain score (%) —Applicability | Standardized domain score (%) —Editorial independence | Number of domains with score ≥ 50% | Recommendation grade |

|—|—|—|—|—|—|—|—|—| | G1 Practice Guideline for the Treatment of Patients with Eating Disorders, Fourth Edition [6] | 100.0 | 97.2 | 93.2 | 97.2 | 76.2 | 100.0 | 6 | A | | G2 Eating Disorders [18] | 100.0 | 93.1 | 89.6 | 98.6 | 91.7 | 100.0 | 6 | A | | G3 Eating Disorders: Guidelines for Medical Care [7] | 91.7 | 47.2 | 24.5 | 75 | 44 | 68.8 | 3 | B | | G4: Identification and Management of Eating Disorders in Children and Adolescents [19] | 91.7 | 48.6 | 42.7 | 73.6 | 41.7 | 89.6 | 3 | B | | G5 Eating Disorders: Recognition and Treatment [8] | 100.0 | 90.3 | 88.5 | 93.1 | 81 | 83.3 | 6 | A | | G6 Guidelines for Nutritional Treatment of Eating Disorders [20] | 100.0 | 70.8 | 38.5 | 86.1 | 48.8 | 45.8 | 3 | B | | G7 Management of Severely Ill Patients with Anorexia Nervosa [21] | 98.6 | 93.1 | 65.1 | 84.7 | 57.1 | 85.4 | 6 | A | | G8 Diagnosis and Treatment of Eating Disorders [22] | 97.2 | 88.9 | 92.7 | 94.4 | 84.5 | 45.8 | 5 | A | | G9 Practice Parameter for the Assessment and Treatment of Children and Adolescents with Eating Disorders [23] | 100.0 | 77.8 | 82.8 | 90.3 | 64.3 | 93.8 | 6 | A | | G10 Chinese Guideline

for the Prevention and Treatment of Eating Disorders [24] | 91.7 | 70.8 | 47.9 | 93.1 | 48.8 | 93.8 | 4 | A | | G11 Clinical Practice Guideline for the Treatment of Eating Disorders [25] | 97.2 | 87.5 | 61.5 | 93.1 | 78.6 | 91.7 | 6 | A | | G12 Anorexia Nervosa: Management [26] | 100.0 | 80.6 | 83.6 | 88.9 | 73.8 | 81.3 | 6 | A | | G13 Recommendations for the Management and Treatment of Eating Disorders in Scotland [27] | 100.0 | 80.6 | 64.6 | 95.8 | 72.6 | 87.5 | 6 | A | | G14 Guidelines for the Nutritional Management of Anorexia Nervosa [28] | 100.0 | 61.1 | 44.8 | 83.3 | 66.7 | 68.8 | 5 | A | | Overall ($\bar{x} \pm s$) | 97.7 $\pm$ 3.4 | 77.7 $\pm$ 16.2 | 65.7 $\pm$ 23.1 | 89.1 $\pm$ 7.7 | 66.4 $\pm$ 16.0 | 81.1 $\pm$ 17.7 | — | — |

Note: — indicates that the corresponding data were not calculated.

Table 4 Summary of recommendations related to nutritional rehabilitation in patients with anorexia nervosa

Item	Recommendations	Recommendation strength / evidence grade
1 General principles of nutrition management	1.1 Establish a nutrition-management team consisting of psychiatrists, psychiatric nurses, registered dietitians, psychotherapists, and pediatricians to continuously assess, adjust, and implement the nutrition-management plan. [6,21,23-24,27]	II / C
1 General principles of nutrition management	1.2 Restore body weight, normalize eating patterns, regain normal perception of hunger and satiety, and treat the physical and psychological complications caused by malnutrition. [6-8,18-20,26,28]	II / B
2 Nutritional assessment and grading	2.1 A formal nutritional-status assessment is recommended at admission. [28]	II / C

Item	Recommendations	Recommendation strength / evidence grade
2 Nutritional assessment and grading	2.2 Nutritional assessment should be repeated regularly; for confirmed cases, at least once per month, and more frequently when the condition fluctuates or progresses. [26]	II / C
2 Nutritional assessment and grading	2.3 Nutritional assessment includes changes in intake and eating patterns—including eating behaviors—restriction of specific foods or food groups such as fats or carbohydrates; history of height and body-weight changes—including highest and lowest body weight and recent body-weight changes; current body mass index—BMI in adults and BMI percentile in children and adolescents; muscle strength; vital signs; and laboratory tests such as electrolytes, glucose, and liver and kidney function. [6-8,18,21,23,25]	II / C
2 Nutritional assessment and grading	2.4 Grading by BMI [21]: (1) low risk: 15.1-17.5 kg/m ² ; (2) moderate risk: 13.0-15.0 kg/m ² ; (3) high risk: < 13.0 kg/m ² .	II / B

Item	Recommendations	Recommendation strength / evidence grade
2 Nutritional assessment and grading	2.5 Multifactorial grading [7,20]: (1) mild malnutrition—consider whether the following are present: using CDC growth curves, age-/sex-adjusted median BMI of 80%-90%, BMI Z-score of -1.0 to -1.99—equivalent to an adult female BMI of 17.2-19.1 kg/m² and male BMI of 18.4-20.5 kg/m²—body-weight loss exceeding 10% of premorbid body weight, and intake 51%-75% of estimated requirements; (2) moderate malnutrition—consider whether the following are present: using CDC growth curves, age-/sex-adjusted median BMI of 70%-79%, BMI Z-score of -2.0 to -2.99—equivalent to an adult female BMI of 15.2-17.2 kg/m² and male BMI of 16.1-18.4 kg/m²—body-weight loss exceeding 15% of premorbid body weight, and intake 26%-50% of estimated requirements; (3) severe malnutrition—consider whether the following are present: using CDC growth curves, age-/sex-adjusted median BMI $< 70\%$, chinaRxiv.org/items/chinaxiv-202006-00065 ≤ -3.0—equivalent to adult female BMI < 15.2 kg/m² and male BMI < 16.0 kg/m²—body-weight loss exceeding 20% of premorbid body weight	II / B

Item	Recommendations	Recommendation strength / evidence grade
3 Nutritional rehabilitation plan		
3.1 Body-weight gain targets	3.1.1 Recommendations according to the overall body-weight gain target:	
3.1 Body-weight gain targets	(1) The recommended target body weight is the body-weight range corresponding to the 25th BMI percentile in adolescents; for adults, BMI ≥ 18.5 kg/m ² . [22]	II / B
3.1 Body-weight gain targets	(2) It is recommended to set an individualized target body weight for the patient, and to make individualized adjustments and monitoring according to the treatment stage. In adolescents, the target body weight should be adjusted upward to accommodate increases in height. During the growth period, the target body weight should be reassessed and revised every 3-6 months. [6-7,21,28]	II / B

Item	Recommendations	Recommendation strength / evidence grade
3.1 Body-weight gain targets	(3) The target body weight for female patients is the body weight at which the menstrual cycle and ovulatory function return to normal; the target body weight for male patients is the body weight at which testicular function returns to normal; for children and adolescents, healthy target body weight should be formulated with reference to growth and development curves. [24]	II / C
3.1 Body-weight gain targets	3.1.2 Recommendations according to weekly body-weight gain targets:	
3.1 Body-weight gain targets	(1) For inpatients, 2-4 lb/week (0.91-1.81 kg); in some hospital programs, at least 1-3 lb/week (0.46-1.36 kg); for individuals in outpatient programs, 1-2 lb/week (0.46-0.91 kg). [6]	II / B
3.1 Body-weight gain targets	(2) For inpatients, 1-2 kg/week; for outpatients, 0.5-1.0 kg. [24]	II / B

Item	Recommendations	Recommendation strength / evidence grade
3.1 Body-weight gain targets	(3) It is generally recommended that inpatients gain 0.5-1.0 kg/week and outpatients gain 0.5-1.0 lb/week (0.23-0.46 kg); outpatient body-weight gain of more than 0.5 kg/week is not recommended. [7,28]	II / C
3.2 Caloric-intake prescription	3.2.1 For inpatients, approximately 1 600 kcal/d, increasing by 300 kcal every 2-3 d, up to 3 500-4 000 kcal/d. [7]	II / B
3.2 Caloric-intake prescription	3.2.2 For individuals with mild to moderate malnutrition: start at 1 400-1 800 kcal/day and increase at a rate of 400 kcal/d until the rate of body-weight change reaches the treatment target. For individuals with severe malnutrition: start at 1 000-1 200 kcal/day or 20-25 kcal/kg, and increase by 200 kcal every other day until the rate of body-weight change reaches the treatment target. [20]	II / B
3.2 Caloric-intake prescription	3.2.3 For inpatients: $25.8 \text{ kcal} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$. [21]	II / C

Item	Recommendations	Recommendation strength / evidence grade
3.2 Caloric-intake prescription	3.2.4 Begin refeeding at 6 000 kJ/d (approximately 1 434 kcal/d), increasing by 2 000 kJ/d (approximately 478 kcal/d) every 2-3 d until adequate intake is reached to meet the patient' s needs for weight restoration. [25]	II / B
3.2 Caloric-intake prescription	3.2.4 Stabilization phase (duration 2-4 weeks): during this phase, ensure daily caloric intake of 1 400-1 500 kcal; recovery phase (duration several months): while maintaining basal metabolic requirements, the patient needs an additional caloric intake of 1 000 kcal/d, meaning a total daily caloric intake of at least 2 200-2 500 kcal; consolidation and maintenance phase: caloric intake is usually 1 800-2 500 kcal/d, up to 3 500 kcal/d. [24]	II / B
3.3 Micronutrients	3.3.1 In addition to increasing caloric intake, patients may routinely receive vitamin and mineral supplementation. [8,22,24,26]	II / B

Item	Recommendations	Recommendation strength / evidence grade
3.3 Micronutrients	3.3.2 It is recommended to supplement calcium through food; if supplements are used, limit the calcium dose to 1 200 mg/d to reduce the possibility of kidney stones or cardiovascular calcification. [6]	II / C
3.4 Nutritional rehabilitation routes	3.4.1 Oral feeding: oral feeding is the first choice. <	

Table 5 Key indicator recommendations and coefficient of variation analysis

Indicator	Body-mass gain weekly target (kg/week)—Inpatient	Body-mass gain weekly target (kg/week)—Outpatient	Initial caloric intake prescription
G1	0.91-1.81	0.46-0.91	—
G2	—	—	—
G3	1-2	—	1 600 kcal/d
G4	—	—	—
G5	—	—	—
G6	—	—	Mild to moderate malnutrition: 1 400-1 880 kcal/d; severe malnutrition: 1 000-1 200 kcal/d
G7	—	0.23-0.46	25.8 kcal · kg ⁻¹ · d ⁻¹
G8	—	—	—
G9	—	—	—
G10	1.0-2.0	0.5-1.0	1 400-1 500 kcal/d
G11	—	—	1 434 kcal/d
G12	0.5-1.0	1.0	—
G13	—	—	—

Indicator	Body-mass gain weekly target (kg/week)— Inpatient	Body-mass gain weekly target (kg/week)— Outpatient	Initial caloric intake prescription
G14	0.5-1.0	<0.5	—
CV (%)	33.2	38.1	5.5

Note: CV = coefficient of variation; —indicates that the original literature did not specify this item.

grading criteria [21]; by contrast, the Academy for Eating Disorders adopts a multifactorial, comprehensive grading model, which better meets the needs of clinical practice [7,20]. Further analysis of the reasons for these differences suggests that they may be related to the composition of the guideline-development teams, the revision processes, and the years in which the evidence was published. The working group of the Royal College of Psychiatrists consisted of 12 psychiatrists, 6 of whom specialized in eating disorders, resulting in a relatively narrow disciplinary composition. The working group of the Academy for Eating Disorders, however, comprised a multidisciplinary team and therefore offered a more comprehensive disciplinary perspective. During guideline revision, the Royal College of Psychiatrists' update was led by two doctoral-level members, who sought opinions by letter from only a small number of psychiatric experts; moreover, the expert panel provided relatively few revision comments, and thus may not have made substantive modifications to the nutritional grading. In addition, differences in the era of evidence publication and in the stage of disciplinary development also played an important role: the first edition of the Royal College of Psychiatrists guideline was published in 2014, when nutritional grading for patients with anorexia nervosa may still have relied mainly on a single indicator. With the deepening of clinical research on eating disorders and the continuous development of multidisciplinary diagnosis and treatment concepts, nutritional assessment and grading have gradually moved toward multidimensional and integrated approaches. Together, these factors have led to discrepancies among guidelines in nutritional grading standards. In China, BMI has the advantages of rapid measurement, low acquisition cost, and high clinical uptake in psychiatric outpatient and inpatient settings; therefore, a single-BMI nutritional grading model is highly feasible at the primary-care level. However, considering that adolescents constitute the main affected population among patients with anorexia nervosa in China and that many have comorbid somatic abnormalities [24], BMI alone is insufficient to accurately reflect the patient's true nutritional status and disease severity. Accordingly, Chinese clinical practitioners may balance the convenience of single-BMI grading with the comprehensiveness of multifactorial integrated grading, and construct localized nutritional assessment tools and grading systems based on BMI while integrating key elements such as somatic indicators, intake, and age. Such systems would not only align with the allocation of current medical resources, but also significantly improve

the precision and clinical applicability of nutritional assessment.

3.4 Nutritional rehabilitation plan

At present, there remains a lack of a unified, evidence-based approach to nutritional rehabilitation worldwide [33]. Relevant guidelines describe only the core elements of nutritional rehabilitation plans, including target values for body-mass gain, caloric intake prescriptions, micronutrient supply, and implementation pathways for nutritional recovery. Among these, the guidelines differ to some extent in their targets for body-mass gain and in the formulation of caloric intake prescriptions. The potential reasons include: (1) differences in the evidence base at the time of publication. Earlier guidelines, out of concern for refeeding syndrome, generally adopted conservative strategies [26,28]; more recently published guidelines have incorporated more systematic reviews and support the implementation of higher-calorie nutritional support under close monitoring. (2) Differences in guideline target populations. The guideline issued by the Royal College of Psychiatrists targets patients with severe anorexia nervosa with $BMI < 15 \text{ kg/m}^2$; therefore, its recommended body-mass gain targets and caloric intake standards are more cautious [21]. (3) Differences between domestic and international healthcare systems. In foreign countries, inpatient costs are relatively high, and treatment tends to follow a “high-calorie, short-course” model; in China, patients’ length of hospitalization is relatively longer [2], making it possible to adopt a gradual nutritional rehabilitation model to ensure the safety of the treatment process. This study further analyzed heterogeneity in recommendations for weekly body-mass gain targets and initial caloric intake prescriptions. The results indicate substantial heterogeneity among guidelines in weekly body-mass gain targets, suggesting that when clinical practitioners formulate body-mass gain goals for patients with anorexia nervosa, they should refer to existing recommendations cautiously in light of the patient’s actual circumstances. Some studies have proposed that the setting of target body mass is not merely the determination of a single-dimensional numerical value; rather, it should be dynamically adjusted by a multidisciplinary team according to individualized features such as the patient’s actual rate of body-mass gain and recovery of physical function. In addition, individualized caloric intake plans can effectively improve patients’ treatment adherence [34–35]. Therefore, psychiatric medical and nursing staff in China may give priority to the relevant recommendations in the *Chinese Guideline for the Prevention and Treatment of Eating Disorders* [20]. On the basis of formulating individualized caloric targets according to the patient’s stage of illness, targeted clinical research should be further conducted to compare the safety, body-mass recovery effects, and long-term prognostic differences of different nutritional rehabilitation strategies among patients in different BMI strata, thereby providing high-quality local evidence for the development of nutritional rehabilitation plans for patients with anorexia nervosa that are suited to China’s national conditions.

3.5 Management of complications

Patients with anorexia nervosa may develop various complications during nutritional recovery, among which refeeding syndrome is the most serious. Its clinical manifestations include rhabdomyolysis, hemolytic anemia, seizures, heart failure, and others [6]. Although approximately 41% of patients with anorexia nervosa develop refeeding syndrome [36], close medical monitoring can effectively prevent this complication. Multidisciplinary teams may follow guideline recommendations by frequently measuring patients' serum phosphorus, magnesium, potassium, and calcium levels during the early stage of refeeding until the values stabilize, and by promptly providing necessary electrolyte supplementation. Previous studies have tended to use low to moderate levels of caloric intake (600–1 600 kcal/d) to avoid refeeding syndrome triggered by rapid caloric increases; other plans have fixed the daily calorie amount (e.g., 1 400 kcal/d) to facilitate standardized management by clinical teams [37]. However, studies in recent years have confirmed that, under close monitoring, higher caloric intake does not increase the incidence of refeeding syndrome and can also shorten the length of hospitalization,

reduce hospitalization-related burdens [38–39]. This also provides a new reference direction for clinical practice: on the basis of strengthened monitoring and electrolyte management, a relatively proactive caloric-intake strategy may be adopted to promote the process of nutritional rehabilitation.

3.6 Psychological interventions

Patients with anorexia nervosa often show reduced adherence to nutritional treatment because of an extreme fear of gaining body mass; therefore, integrating psychological treatment into nutritional rehabilitation programs is of critical importance [6,25,28]. Recommendations regarding psychological interventions are generally consistent across guidelines: cognitive behavioral therapy and family-based treatment are recommended as first-line psychological treatments for adult and adolescent patients, respectively. Cognitive behavioral therapy aims to help patients identify and correct distorted cognitions about food, body shape, and body mass, and it also has positive effects in improving depressive symptoms, interpersonal difficulties, and emotion regulation [40]. Family-based treatment empowers parents to take responsibility for adolescents' body-mass restoration, gradually shifts toward appropriate control, and ultimately helps adolescents develop independence [1]. Compared with other countries, China places greater emphasis on family values and collectivism, and family-based treatment therefore has natural cultural adaptability. However, studies have also indicated that high-quality randomized controlled trials supporting family-based treatment remain limited, and the results may carry a risk of bias [41]. In addition, other psychological interventions—such as interpersonal psychotherapy, focal psychodynamic therapy, and specialist supportive clinical management—also have exploratory value in clinical practice, but their effectiveness still lacks sufficient high-level evidence, and their application remains at an

early stage. It should be noted that clinical psychotherapists are currently relatively scarce in China [42], and primary medical institutions in particular find it difficult to meet the psychological-treatment needs of patients with anorexia nervosa; as a result, existing psychological interventions face bottlenecks in human resources during clinical dissemination. Therefore, while expanding the scale of training for psychotherapists in the future, auxiliary methods such as digital psychological interventions may be used. However, more rigorously designed high-quality studies are still needed to further verify the effectiveness and applicable contexts of different psychological-treatment methods—especially multicenter randomized controlled trials based on Chinese patients with anorexia nervosa—so as to provide more solid evidence for clinical decision-making.

3.7 Deficiencies in and recommendations for improvement of guidelines related to nutritional rehabilitation in patients with anorexia nervosa

- (1) Lack of individualized nutritional-rehabilitation programs: Most guidelines provide nutritional-rehabilitation plans based on body-mass gain targets, but they do not comprehensively consider patients' nutritional assessment results. It is recommended that, on the basis of nutritional assessment, objective indicators such as body-composition analysis and resting energy expenditure measurement be incorporated to formulate staged and adjustable individualized nutrition plans.
- (2) Insufficient attention to special populations: Differences in nutritional-intervention strategies for groups such as children and adolescents, males, and patients with comorbidities (e.g., diabetes) are insufficiently reflected. It is recommended that auxiliary decision-making modules or sub-guidelines be developed for different ages, sexes, and comorbidity conditions, providing differentiated nutritional targets, caloric arrangements, and risk-response strategies.
- (3) Lack of localization and cultural adaptability: Current guidelines related to nutritional rehabilitation mostly originate from other countries, and are simultaneously constrained by the paucity of high-level evidence and insufficient adaptation to local contexts. Directly applying foreign recommendations would markedly reduce the feasibility of clinical practice and patients' treatment adherence. It is recommended that Chinese scholars conduct targeted, high-quality clinical studies based on Chinese populations; while improving the existing recommendation system, they should construct localized nutritional-rehabilitation programs that combine evidence-based support with cultural adaptability, and gradually establish a guideline-updating mechanism suited to local practice. In addition, when introducing foreign guidelines, domestic scholars or professional societies are advised to establish localization and transformation working groups to conduct cross-cultural debugging and clinical applicability evaluation of recommendations, rather than directly translating or adopting them.

4 Summary

This study included 14 guidelines related to nutritional rehabilitation in patients with anorexia nervosa. Their overall quality was relatively high, but rigor, applicability, and stakeholder involvement still require improvement; moreover, existing guidelines show certain differences in recommendations regarding key links such as nutritional-assessment grading and nutritional-rehabilitation planning. This also suggests that, while prudently referring to and integrating existing evidence-based evidence for clinical application, psychiatric medical and nursing personnel should formulate high-quality evidence-based guidelines suited to China's national conditions when necessary, so as to systematically improve the standardization and effectiveness of nutritional rehabilitation for patients with anorexia nervosa in China. In addition, this study has certain limitations: it included only publicly published Chinese- and English-language guidelines, and the AGREE tool used evaluates only the methodological quality of guidelines and cannot make scientific judgments about the specific content of recommendations; therefore, the results may have some bias.

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Note: Figure translations are in progress. See original paper for figures.

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