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Emotional Eating and Spicy Food Consumption Related to Dyspepsia in Female Adolescents: A Literature Review

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Abstract

Dyspepsia is a highly prevalent functional gastrointestinal disorder, particularly among adolescents, and Indonesia has one of the highest reported prevalence rates globally. Recent literature has highlighted the potential role of behavioral and dietary factors, such as emotional eating and spicy food consumption, in the development and exacerbation of dyspeptic symptoms. This review focuses on female adolescents, a population shown to be more vulnerable to emotional and hormonal fluctuations that may increase susceptibility to digestive disturbance. Peer-reviewed articles from the last decade were identified through Pubmed and Google Scholar, then selected based on relevance to the themes of emotional eating, spicy food intake, and dyspepsia. Thematic analysis of the included studies reveals consistent evidence of a link between emotional eating and high energy-dense and irritant food intake, including spicy foods, while frequent consumption of spicy food itself was significantly associated with dyspeptic symptoms such as epigastric pain, bloating, and early satiety. Furthermore, the co-occurrence of emotional and dietary stressors had synergistic effects on the risk of dyspepsia in female adolescents. Further robust, longitudinal, and controlled studies are needed to clarify the mechanism involved. Nevertheless, current evidence supports the inclusion of behavioral and dietary assessment in the early identification and management of dyspepsia in adolescent females.

Keywords: *Dyspepsia, Emotional Eating, Spicy Food, Female Adolescents, Eating Behaviour.*

INTRODUCTION

Dyspepsia is a syndrome characterized by a collection of symptoms originating from upper digestive disturbances, particularly in the epigastric to upper left abdominal region. It generally occurs over a long period with varying intensities, which can be continuous, intermittent, or recurrent manifesting as pain or discomfort, including fullness, epigastric burning, nausea, vomiting, and excessive belching. Although this condition is considered non-threatening, it has been highlighted to significantly impair quality of life (Syam et al., 2023). Globally, the World Health Organization (WHO) estimates the prevalence of dyspepsia at 13-40% annually, with higher rates reported in developing countries, such as Indonesia. In Indonesia, it ranks among the most common outpatient complaints, and disproportionately affects females, with the 2021 Indonesian Health Profile reporting that 60,2% of hospitalized dyspepsia cases involved female

patients, compared to 39,8% among males (Kemenkes RI, 2022). These data suggest that gender may be a contributing risk factor in the development of dyspepsia. Furthermore, this data also demonstrates that dyspepsia has a substantial financial impact on the Indonesian healthcare system in addition to its physical health consequences. Direct medical costs for this disease, which include doctor consultations, endoscopic and pharmaceutical therapy, are projected to be billions of rupiah, with BPJS Kesehatan and low-income households bearing the majority of the burden. Additionally, female who suffer from chronic dyspepsia, particularly at productive stages like adolescence, see a marked decline in their quality of learning which have an impact on their achievement. This situation will affect the quality of adolescents as human resources for the next generation (Indarna & Suryadi, 2022)

Along with gender, psychological factors are known to be one of the significant contributors to dyspepsia. The poor psychological status, particularly stress, often arising from environmental and emotional pressures, has been linked to the exacerbation of dyspeptic symptoms (Miwa et al., 2022). Stress via the gut-brain axis through hormonal mediators such as Corticotropin-Releasing Hormone (CRH) alters gastrointestinal motility, mucosal integrity, and visceral sensitivity (Rupp & Stengel, 2022). In response to this psychological distress, individuals may adopt coping mechanisms as an effort to reduce anxiety and excessive negative thoughts in this condition. One of the prevalent forms of coping is emotional eating, characterized by an increase or decrease in food intake driven by emotional rather than physiological hunger (Abdurrahman, 2020). This condition is closely related to central nervous system dysregulation, including leptin and ghrelin, hormones responsible for hunger and satiety, thereby disrupting normal appetite control (Fan et al., 2025). This behavior has been linked to irregular eating patterns, acid reflux, and impaired gastric emptying that are considered as key factors in the pathogenesis of dyspepsia (Francis & Zavala, 2025; H. Liu et al., 2020).

Moreover, the presence of emotions in emotional eating is also known to influence a person's food choices and eating habits (Fayasari & Lestari, 2022). Food choices will tend to shift towards foods perceived as comforting and may reduce the negative effects of stress, one of which is spicy food. Capsaicin, the main active compound in spicy food, can stimulate endorphin release and temporarily enhance mood (Rianti et al., 2022). This may explain the popularity of spicy food in countries like Indonesia, where only 6,4% of the total population are not consuming spicy foods (Cindy & Wowor, 2022). However, excessive intake of capsaicin has been shown to irritate the gastric mucosa by increasing acid secretion and potentially leading to ulcers or dyspeptic symptoms (Lonah et al., 2024).

These two key factors are particularly concerning among female adolescents. Their transitional phase marked by emotional instability and hormonal changes seems to increase vulnerability to stress-related eating behaviors. A study by Van Strien *et al*. (2009) showed that emotional eating has increased among adolescents over the past two decades, while the rising trends in spicy food consumption were observed by Zhang *et al.* (2022). The combined impact of these two, psychological stress and unhealthy eating habits may not only reduce quality of life but also may be associated with long-term gastrointestinal risks, including gastric ulcers and in severe cases gastric cancer (Rahayu, 2020). Despite several previous studies exploring the individual roles of emotional eating and dietary triggers such as spicy food in the incidence of dyspepsia, earlier literature reviews tend to discuss the psychological pathways and physiological pathways separately, without integrating the synergistic effects, particularly in female adolescents. Therefore, this literature review aims to investigate the interrelated associations between emotional eating, spicy food intake, and dyspepsia in female adolescents.

METHOD

A literature review was conducted using a narrative review approach to examine articles related to emotional eating and the frequency of spicy food consumption as risk factors for dyspepsia among female adolescents. The review was completed up to 19 May 2025, using specific keywords in the databases of the US National Library of Medicine (PubMed.gov), Google Scholar (www.googlescholar.com), and Google Search. The keywords used included dyspepsia, emotional eating, spicy food, gastrointestinal symptoms, eating behavior, and combinations of these terms in relation to female adolescents. Relevant peer-reviewed publications were identified by the researcher through an advanced search and systematically screened based on the title, abstract, and finally the full text of the studies. The reference lists of the selected articles and reviews were also used to identify additional studies. Only studies published between 2015 and 2025 were considered. Inclusion criteria focused on topic relevance, adolescent female populations, and clear reporting of findings. Articles not available in full text or not published in Indonesian or English were excluded.

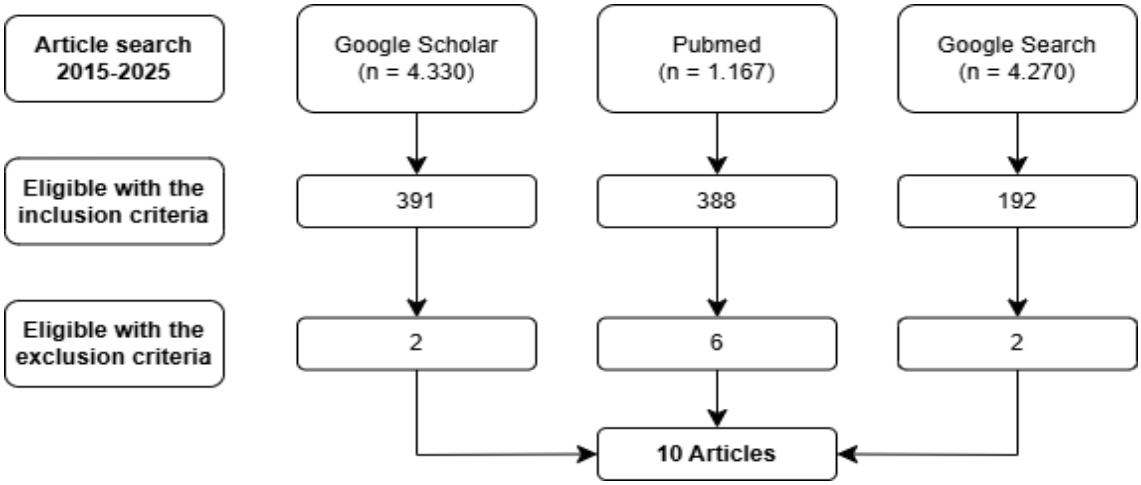

Figure 1. Article Selection Scheme

During the process of selecting articles from the databases of the US National Library of Medicine (PubMed.gov), Google Scholar (www.googlescholar.com), and Google Search, several similar articles were found. Out of 971 initial records identified, 146 were eliminated as duplicates and 815 were excluded at the title and abstract screening that they were not relevant to the main themes or they were grey literature or editorials without primary data and not available for full-text on English language. The 10 final articles were selected because they met the highest quality criteria that they using validated instruments to measure, reporting statistically significant effect sizes with confidence intervals, and relevant data to the main themes. These criteria ensure that the selected studies have methodological strength and high clinical relevance to synthesize evidence of the synergy of eating behavior factors on dyspepsia in female adolescents. The chosen publications also make use of the flow chart for Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) which aids researchers in drawing conclusions about their studies.

The quality of the 10 included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools which appropriate for each study design. The overall quality was moderate to high, with 8 from 10 studies (80%) scoring ≥7/10 on their respective JBI checklist. These studies demonstrated robust sampling (≥200 participants) validated tools, statistical adjustment for confounders, and unambiguous outcome

reporting. Two cross-sectional studies received a 6/10 rating due to self-reported outcomes that lacked biochemical confirmation, but were kept for their high sample numbers (n>500) and strong effect estimates. This rigorous quality assessment assures scientific rigor while minimizing bias in the synthesized evidence.

RESULT

In total, 10 full-text studies were assessed for eligibility, met the inclusion and exclusion criteria, and were selected for the present literature review. Specifically, six were identified as cross-sectional studies, two as literature reviews, and one each as prospective study and a clinical trial. All included studies explored interrelated associations among emotional eating, spicy food intake, and dyspepsia, either as independent or interacting risk factors. To provide a clearer context, Table 1 summarizes the key characteristics and main findings of each included study.

Table 1. Characteristics of the Studies Assessing the Role of Emotional Eating and Spicy Food Consumption as Risk Factors for Dyspepsia in Female Adolescents

No.	Year	Author	Title	Method	Main Findings
1.	2024	Jun Liu, Yiru Pan, Liuxi Wang, Ahui Tao, Yuanyuan Deng, Yue Qiu, Yifei Cao, Shufen Han, Xiao Yan, Xianrong Xu, Xuexian Fang, and Fuzhi Lian	The Association Between Appetite and Eating Behaviors Among Chinese Female University Students	• Type of Study: cross-sectional • Population: female students from a public university in Eastern China	Appetite traits, specifically food responsiveness and emotional overeating, were significantly associated with a higher intake frequency of spicy meals and snacks. Emotional overeating was positively related to the consumption of spicy snacks (p=0.09, *p*=0.04), while food responsiveness showed strong associations with both spicy meals and snacks (both p=0.24, *p*<0.01).
2.	2024	Lonah, Made Divara Ariesta Sekar Suryadi, Zita Arieselia, Sandy Vitria Kurniawan, Linawati Hananta, Jonny Setiawan, Edward Surjono, Mariani Santosa, Evi Ulina Margareta Situmorang, Tan Fei Fan, Yuliana, and Ecie Budiyanti	Assessing the Correlation between Spicy Food Consumption and Dyspepsia Symptoms in Medical and Health Students at Atma Jaya Catholic University of Indonesia	• Type of Study: cross-sectional • Population: Medicine & Health Sciences students from Atma Jaya Catholic University	Frequent spicy food consumption was significantly associated with dyspepsia (p=0.014, *p*<0.05), with 56.1% of participants found often consuming spicy foods and 95.3% of them reported having dyspepsia.

No.	Year	Author	Title	Method	Main Findings
3.	2016	S.-Y. Lee, T. Masaoka, H. S. Han, J. Matsuzaki, M. J. Hong, S. Fukuhara, H. S. Choi, and H. Suzuki	A Prospective Study on Symptom Generation According to Spicy Food Intake and TRPV1 Genotypes in Functional Dyspepsia Patients	• Type of Study: prospective study • Population: consecutive Functional Dyspepsia (FD) patients between 20-70 years old	Upper Gastrointestinal (UGI) symptoms, specifically, stomach fullness and retching are significantly correlated with spicy food intake (p=0.001), especially among females and younger individuals regardless of TRPV1 genotypes and the *H. pylori* infection status in FD patients.
4.	2023	Gulay Yilmazel, Emre Keles, and Nur Pinar Ayaz	Emotional Eating in Relation to Gastrointestinal Symptoms and Burnout among Young Women during the Pandemic	• Type of Study: cross-sectional • Population: women aged 20-49 years old from the family medicine clinic of a university hospital in Corum city, Turkey	Emotional eating was prevalent among participants (73.8%), with severe gastrointestinal symptoms, especially indigestion and Covid-19 burnout were significantly identified as a strong risk for emotional eating ($p<0.05$).
5.	2020	Hanmei Liu, Qiping Yang, Jing Luo, Yufeng Ouyang, Minghui Sun, Yue Xi, Cuiting Yong, Caihong Xiang, and Qian Lin	Association between Emotional Eating, Depressive Symptoms and Laryngopharyngeal Reflux Symptoms in College Students: A Cross-Sectional Study in Hunan	• Type of Study: cross-sectional • Population: first and second-year students from two universities in Changsha, Hunan Province, China	Emotional eating and depressive symptoms had strong association with laryngopharyngeal reflux symptoms (AOR=3.822, 95% CI 2.126–6.871 vs. AOR=4.093, 95% CI 2.516–6.661).
6.	2016	Parvane Saneei, Omid Sadeghi, Awat Feizi, Ammar Hassanzadeh Keshteli, Hamed Daghaghzadeh, Ahmad Esmaillzadeh,	Relationship between Spicy Food Intake and Chronic Uninvestigated Dyspepsia in Iranian Adults	• Type of Study: cross-sectional • Population: Iranian adults living in Isfahan Province	Spicy food intake was significantly associated with higher odds of chronic uninvestigated dyspepsia (CUD) (OR 1.64, 95% CI 1.09–2.49, $p<0.05$), postprandial fullness (OR 1.76, 95% CI 1.29–2.40, $p<0.05$),

No.	Year	Author	Title	Method	Main Findings
		and Peyman Adibi			and epigastric pain (OR 1.78, 95% CI 1.30–2.44, p<0.05), but not early satiation.
7.	2020	Tanisa Patcharatrakul, Chatchai Kriengkirakul, Tawatchai Chaiwatanarat, and Sutep Gonlachanvit	Acute Effects of Red Chili, A Natural Capsaicin Receptor Agonist, on Gastric Accommodation and Upper Gastrointestinal Symptoms in Healthy Volunteers and Gastroesophageal Reflux Disease Patients	• Type of Study: randomized double-blind crossover clinical trial • Population: health volunteers (HV) and non-erosive reflux disease (NERD) patients between 18-65 years old	Gastric accommodation (GA) and postprandial GVs at 10, 20 and 30 min after chili compared to placebo was found higher in NERD patients than HV (451 ± 89 vs. 375 ± 81 mL, p<0.05) and (10 min, 600 ± 73 vs. 526 ± 70 mL; 20 min, 576 ± 81 vs. 492 ± 78 mL; 30 min, 532 ± 81 vs. 466 ± 86 mL, all p<0.05). Chili was also associated with less satiety, more severe abdominal burning (p<0.05) and more severe heartburn (p=0.06) in NERD patients compared to placebo. No significant associations were observed in HV (p>0.05).
8.	2022	Yasunori Yamamoto, Shinya Furukawa, Junichi Watanabe, Aki Kato, Katsunori Kusumoto, Teruki Miyake, Eiji Takeshita, Yoshio Ikeda, Naofumi Yamamoto, Katsuhiko Kohara, Syuichi Saheki, Yuka Saeki, and Yoichi Hiasa	Association between Eating Behavior, Frequency of Meals, and Functional Dyspepsia in Young Japanese Population	• Type of Study: cross-sectional • Population: Japanese university students	Eating behavior, such as skipping breakfast and/or lunch had positive association (AOR=1.60, 95% CI, 1.10-2.32 and AOR=2.52, 95% CI, 1.04-5.18), while skipping dinner, extra meals (snacks), or midnight snacks had not significant association with FD. Frequency of meals was independently inversely associated with prevalence of FD (1 meal per day, AOR=2.72, 95% CI 1.19-5.42; and 2 meal per day, AOR=1.69, 95% CI 1.16-2.43, all p=0.01).

No.	Year	Author	Title	Method	Main Findings
9.	2023	Rahmat Hidayat, Agung Susanto, and Anik Lestari	Literature Review: The Relationship between Eating Habits and Dyspepsia in Adolescents	• Type of Study: literature review • Population: adolescents with dyspepsia in Indonesia	Irregular eating habits, including spicy and fatty food consumption were identified as contributing factors to dyspepsia in adolescents, with higher vulnerability was found among females.
10.	2023	Charalampia Amerikanou, Stamatia-Angeliki Kleftaki, Evdokia Valsamidou, Eirini Chroni, Theodora Biagki, Demetra Sigala, Konstantinos Koutoulogenis, Panagiotis Anapliotis, Aristea Gioxari, and Andriana C. Kaliora	Food, Dietary Patterns, or Is Eating Behavior to Blame? Analyzing the Nutritional Aspects of Functional Dyspepsia	• Type of Study: review article • Population: general adult population	Most observational studies demonstrated some causal relationship between specific foods and FD symptoms that triggers FD patients. Fatty and spicy foods, processed foods, wheat products, and other overall foods from the Western dietary pattern are considered inducers of FD symptoms.

All studies included in this review revealed several recurring patterns that highlight the multifactorial nature of dyspepsia in female adolescents, with emotional eating and dietary triggers, particularly spicy foods, emerging as interrelated factors. Although the populations and study designs varied, consistent patterns were observed across studies linking psychosocial stress, maladaptive eating behaviors, and the intake of irritant foods with the onset worsening of dyspeptic symptoms.

Emotional Eating as a Behavioral Risk Factor

Emotional eating is a common behavior among female adolescents, particularly in response to psychological stressors such as academic pressure, body dissatisfaction, and mood instability. Several studies reported a significant relationship between emotional eating and gastrointestinal symptoms. Yilmazel, Keles and Ayaz, (2023) found that indigestion and Covid-19 burnout significantly predicted higher emotional eating scores among female adolescents in Corum, Turkey ($p<0.05$), with 73,8% of participants classified as emotional eaters. Similarly, Liu *et al.*, (2020) demonstrated a positive correlation between emotional eating and upper gastrointestinal complaints, particularly laryngopharyngeal reflux symptoms among university students in Changsha, China. Additionally, Yamamoto *et al.*, (2022) provided evidence that emotional eating, often associated with behaviors such as meal skipping or irregular eating frequency, may increase the prevalence of functional dyspepsia among Japanese university students. These findings suggest that emotional eating is not only a maladaptive coping mechanism,

but also a contributor to physiological disturbances in the gastrointestinal system, specifically affecting gastric sensitivity and motility. This underscores a potential pathway by which psychological stress manifests as somatic discomfort.

Consumption of Spicy Food as a Physiological Trigger

The consumption of spicy foods, particularly those containing capsaicin, was frequently identified as a dietary trigger for dyspeptic symptoms such as postprandial fullness, epigastric pain, and bloating. Capsaicin, the active component in chili, is known to stimulate gastric acid secretion and may compromise mucosal integrity in sensitive individuals. In prospective study by Lee *et al.*, (2016), spicy food intake significantly increased sensations of stomach fullness among patients with functional dyspepsia, especially female adolescents, regardless of TRPV1 genotype or *H. pylori* status ($p=0.001$). Similarly, Saneei *et al.*, (2016) found that higher spicy food intake was associated with increased odds of uninvestigated dyspepsia, postprandial fullness, and epigastric pain (AORs 1.64-1.78; $p<0.05$). Experimental evidence from Patcharatrakul *et al.*, (2020) further demonstrated that chili consumption increased gastric volume and worsened abdominal burning in NERD patients. These findings align with conclusions from Amerikanou *et al.*, (2023), who noted that certain dietary components, such as spicy foods, are frequently reported to trigger functional dyspepsia symptoms. Overall, the evidence supports the biological plausibility of capsaicin as a gastric irritant, particularly among individuals with heightened visceral sensitivity.

Female Adolescents and Gender-Specific Vulnerabilities

Several studies emphasize the increased vulnerability of female adolescents to dyspepsia, particularly in response to emotional and dietary factors. Hidayat, Susanto and Lestari, (2023) highlighted that irregular eating patterns and spicy food consumption were more prevalent among female adolescents, contributing to higher incidence of dyspeptic symptoms. These gender-specific patterns may be influenced by hormonal fluctuations during puberty, increased emotional reactivity, and body image concerns, all of which intensify susceptibility to gastrointestinal disturbances through alterations in gut-brain axis functioning. Yilmazel, Keles and Ayaz, (2023) and Liu *et al.*, (2024) further support this trend, reporting higher levels of emotional eating and spicy food consumption among female students compared to the general population. These behaviors may amplify physiological responses, providing a possible explanation for the disproportionately high prevalence of dyspepsia among female adolescents.

Interaction Between Emotional and Dietary Triggers in Dyspepsia

The reviewed literature suggests that emotional eating and spicy food intake may not act independently but instead interact synergistically to increase dyspepsia risk. Liu *et al.*, (2024) found that emotional overeating and food responsiveness were positively associated with the intake of spicy meals and snacks ($p<0.05$), indicating that individuals who eat in response to emotions may be more inclined to consume irritant foods. This interaction may create a self-reinforcing cycle in which psychological stress leads to the intake of dyspepsia-inducing foods, exacerbating gastrointestinal discomfort and further perpetuating emotional distress. These findings underscore the importance of addressing both emotional and dietary components in dyspepsia prevention and management strategies, particularly among adolescents.

Overall, the themes presented above indicate that both emotional and dietary factors significantly contribute to the onset and persistence of dyspepsia in female adolescents. A multidisciplinary approach, including nutritional counseling, emotional regulation

strategies and public health education, may be essential for effective intervention and prevention.

DISCUSSION

The findings of this literature review indicate that emotional eating and the frequency of spicy food consumption are associated with the occurrence of dyspepsia in female adolescents. The interaction between emotional eating and spicy food consumption has the potential to further increase the risk of dyspepsia. Emotional eating, which is eating in response to negative emotions, is often associated with episodes of uncontrolled eating, late meal times, and poor diet quality, which increases the workload on the stomach and disrupts normal digestive processes. Female adolescents appear more vulnerable due to a combination of hormonal fluctuations and psychosocial stressors, such as academic pressure, body image, and social dynamics, which contribute to a higher prevalence of emotional eating and functional gastrointestinal symptoms compared to boys. When this behavior involves frequent consumption of spicy foods, this combination of psychological and physiological factors can lead to more persistent and severe symptoms of dyspepsia, confirming that dyspepsia in female adolescents is multifactorial with a close interaction between dietary, psychological, and behavioral factors.

This literature review has several limitations that should be carefully considered. Most of the included studies employed observational designs, predominantly cross-sectional, which inherently limits the ability to establish causal relationships between emotional eating, the frequency of spicy food consumption, and the occurrence of dyspepsia. As a result, it remains unclear whether emotional eating and spicy food consumption directly contribute to dyspepsia or whether dyspeptic symptoms may, in turn, influence eating behaviors. In addition, many studies relied on self-reported measures to assess dietary intake, emotional eating behaviors, and gastrointestinal symptoms, which may have introduced recall bias and social desirability bias, potentially affecting the accuracy of the reported findings. Furthermore, variations in definitions and measurement tools for emotional eating, spicy food consumption frequency, and dyspepsia across studies may have contributed to inconsistencies in reported outcomes.

Despite these limitations, the reviewed studies collectively provide valuable insights into the complex interaction between psychological and dietary factors in dyspepsia among adolescents. However, to strengthen the evidence base, future research should prioritize longitudinal and prospective study designs to better clarify temporal and causal relationships. Controlled studies that incorporate standardized assessment tools, objective dietary measurements, and validated dyspepsia diagnostic criteria are also needed. Additionally, future research should adopt a more holistic approach by integrating psychological, behavioral, and physiological variables, including stress levels, coping mechanisms, and hormonal factors, to better capture the multifactorial nature of dyspepsia in female adolescents. Such improvements in study design are essential to inform effective prevention strategies and evidence-based public health interventions targeting adolescent gastrointestinal health.

CONCLUSION

In this review, we examined 10 recent studies to explore the relationship between emotional eating, spicy food consumption, and dyspepsia in female adolescents. Current evidence suggests that both factors are frequently involved in the onset and worsening of dyspeptic symptoms. Emotional eating, often triggered by psychological stress, was consistently linked to irregular eating patterns and the consumption of irritant foods. Spicy food, particularly capsaicin-containing products, was also shown to negatively

affect gastric function in susceptible individuals. Although the reviewed studies demonstrate a strong association, the majority were observational and limited in scope. More rigorous longitudinal and interventional studies are needed to establish causality and clarify the mechanisms involved. Nonetheless, these findings support the relevance of integrating behavioral and dietary assessments into dyspepsia prevention strategies, especially for female adolescents.

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