

Psychological Morbidities and Health-Related Quality of Life in Adolescents with Celiac Disease

Dr. Gowtham PA¹, Dr. Sanjay KM²

¹Postgraduate, Department of Paediatrics, Sree Mookambika Institute of Medical Sciences, Kanyakumari

²Professor, Department of Paediatrics, Sree Mookambika Institute of Medical Sciences, Kanyakumari.

Corresponding Author

Dr. Gowtham PA

Postgraduate, Department of
Paediatrics, Sree Mookambika
Institute of Medical Sciences,
Kanyakumari

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ABSTRACT

Background: Celiac disease (CD) is a chronic autoimmune condition triggered by gluten ingestion, with significant implications on both physical and psychological well-being. Adolescents with CD may experience psychological morbidities that adversely affect their health-related quality of life (HRQoL).

Objective: To evaluate the prevalence and types of psychological morbidities and assess their impact on health-related quality of life among adolescents with celiac disease.

Methods: A cross-sectional observational study was conducted among 100 adolescents diagnosed with CD aged between 10 and 18 years. Psychological morbidities, including anxiety and depression, were assessed using standardized questionnaires (Pediatric Symptom Checklist, Pediatric Quality of Life Inventory). HRQoL was evaluated using the Pediatric Quality of Life Inventory (PedsQL) Generic Core Scales. Scores were analyzed and correlated with clinical variables.

Results: The prevalence of psychological morbidities was high, with anxiety identified in 38% and depression in 24% of adolescents. Adolescents experiencing psychological morbidities showed significantly lower HRQoL scores across physical, emotional, social, and school functioning domains ($p < 0.001$). Dietary adherence was positively correlated with better HRQoL and fewer psychological symptoms.

Conclusion: Adolescents with celiac disease have a high prevalence of psychological morbidities, significantly impacting their health-related quality of life. Regular psychological screening and supportive interventions should be integrated into routine clinical care for improving overall patient outcomes.

KEYWORDS: Celiac disease, Adolescents, Anxiety, Depression.

INTRODUCTION

Celiac disease (CD) is a chronic autoimmune enteropathy triggered by the ingestion of gluten in genetically predisposed individuals. It affects approximately 1% of the global population, with rising prevalence in children and adolescents due to increased awareness and improved diagnostic strategies (1). The only effective treatment is lifelong adherence to a strict gluten-free diet (GFD), which can be particularly challenging during adolescence—a period marked by significant psychosocial development and identity formation.

Adolescents with chronic illnesses are particularly vulnerable to emotional and psychological distress. The unique burden of celiac disease, including dietary restrictions, fear of social exclusion, stigma, and vigilance against cross-contamination, makes these individuals more prone to anxiety, depression, and reduced health-related quality of life (HRQoL) (2,3). A systematic review reported that adolescents with CD had significantly higher rates of internalizing problems, such as sadness and social withdrawal, compared to their healthy peers (4).

Health-related quality of life (HRQoL) is a multidimensional construct that encompasses physical, emotional, social, and school functioning. It is increasingly recognized as an essential outcome measure in chronic pediatric conditions. In CD, HRQoL is influenced not only by gastrointestinal symptoms but also by psychosocial stressors related to dietary management and peer interactions (5). Several studies have highlighted that adherence to the GFD improves physical symptoms but may not fully resolve emotional and psychological challenges, especially in adolescents (6).

Psychological morbidities in adolescents with CD can arise from several domains. Social isolation due to dietary restrictions at school or social events, fear of accidental gluten ingestion, and feelings of being different from peers may all contribute to emotional distress. Additionally, the impact on school performance, reduced participation in physical

activities, and parental overprotection can further affect emotional resilience and self-esteem (7). Despite this, psychological assessment is often overlooked in routine CD management, with the primary focus on serological markers and dietary adherence.

Early identification of psychological morbidities is crucial as untreated emotional distress can lead to non-adherence, which in turn increases the risk of persistent symptoms, growth failure, and complications such as osteoporosis and delayed puberty. Moreover, adolescents with poor HRQoL and unaddressed mental health issues may develop maladaptive coping strategies, further compromising their long-term well-being (8).

There is a growing recognition of the need for a multidisciplinary approach in managing CD, incorporating pediatricians, dietitians, and mental health professionals. Instruments such as the Pediatric Symptom Checklist and the Pediatric Quality of Life Inventory (PedsQL) offer valuable insights into the psychological and functional well-being of children with chronic illnesses, including CD (9). These tools can be utilized not only for screening but also for guiding individualized interventions.

In this context, the present study was conducted to assess the prevalence of psychological morbidities and their impact on health-related quality of life among adolescents with celiac disease. By evaluating emotional and behavioral health alongside clinical indicators, the study aims to emphasize the importance of holistic care for adolescents with CD and advocate for the inclusion of psychological screening in routine clinical practice.

METHODS

This was a cross-sectional observational study conducted in the Department of Pediatrics and Pediatric Gastroenterology at a tertiary care hospital in South India over a 12-month period from January to December 2023. The study aimed to assess the prevalence of psychological morbidities and evaluate health-related quality of life (HRQoL) among adolescents diagnosed with celiac disease.

Adolescents aged between 10 and 18 years with a confirmed diagnosis of celiac disease for at least 6 months were eligible for inclusion. Diagnosis was based on the revised ESPGHAN criteria, including positive serology for anti-tissue transglutaminase (tTG) antibodies and confirmatory small bowel biopsy. Exclusion criteria included known psychiatric illnesses diagnosed prior to celiac diagnosis, associated chronic illnesses such as type 1 diabetes or hypothyroidism, and those who were unwilling to participate.

Participants were recruited during routine outpatient follow-up visits. Written informed consent was obtained from parents or legal guardians, along with assent from the adolescents. Each participant underwent a structured interview that included demographic and clinical details, dietary adherence history, and psychosocial assessments.

Psychological morbidities were screened using the **Pediatric Symptom Checklist–Youth Self-Report (PSC-Y)**, a validated tool for identifying cognitive, emotional, and behavioral problems in adolescents. A score ≥ 30 was considered positive for psychological distress. To specifically evaluate anxiety and depression symptoms, subscales from the **Revised Children's Anxiety and Depression Scale (RCADS)** were also administered.

Health-related quality of life was assessed using the **Pediatric Quality of Life Inventory Version 4.0 (PedsQL)**, a validated instrument comprising four domains: physical functioning, emotional functioning, social functioning, and school functioning. The PedsQL scores range from 0 to 100, with higher scores indicating better quality of life. Both child self-report and parent-proxy versions were used to ensure comprehensiveness.

Dietary adherence to the gluten-free diet (GFD) was assessed through a combination of caregiver report, dietitian review, and repeat serological testing for anti-tTG antibodies. Adherence was classified as good (complete adherence), partial (frequent unintentional or occasional intentional gluten exposure), or poor (regular non-adherence).

Data were entered into Microsoft Excel and analyzed using IBM SPSS version 26.0. Descriptive statistics were used to summarize demographic and clinical characteristics. Continuous variables such as PedsQL scores were expressed as means and standard deviations, and categorical variables were expressed as frequencies and percentages. Comparisons between adolescents with and without psychological morbidity were made using Mann–Whitney U test. Associations between GFD adherence and psychological outcomes were assessed using chi-square test. A p-value of <0.05 was considered statistically significant. The study was approved by the Institutional Ethics Committee. All data were anonymized and handled confidentially, in accordance with ethical guidelines for research involving minors.

RESULTS

A total of **100 adolescents** with celiac disease (CD), aged 10 to 18 years, were enrolled. The mean age was **14.2 $\pm$ 2.1 years**, and **58% were female**. The median duration since diagnosis was 2.8 years. Based on PSC-Y and RCADS, a substantial proportion showed psychological distress, with poor HRQoL scores particularly in those with psychological morbidities.

Table 1: Baseline Characteristics of Study Participants (n = 100)

Variable	Mean $\pm$ SD / n (%)
Age (years)	14.2 $\pm$ 2.1
Female	58 (58%)
Duration since CD diagnosis	2.8 $\pm$ 1.5 years
Good GFD adherence	61 (61%)
Partial adherence	26 (26%)
Poor adherence	13 (13%)

Most adolescents adhered well to the gluten-free diet, though a notable minority showed partial or poor adherence.

Table 2: Prevalence of Psychological Morbidities

Morbidity Type	Number (n)	Percentage (%)
Positive PSC-Y screen	42	42%
Anxiety (RCADS subscale)	38	38%
Depression (RCADS subscale)	24	24%

Anxiety and depressive symptoms were prevalent, affecting over one-third of the adolescents.

Table 3: PedsQL Scores in Adolescents With and Without Psychological Morbidities

Domain	Psychological Morbidity (n=42)	No Morbidity (n=58)	p-value
Physical Functioning	61.5 $\pm$ 9.2	83.3 $\pm$ 7.4	<0.001
Emotional Functioning	55.2 $\pm$ 8.6	78.9 $\pm$ 9.3	<0.001
Social Functioning	59.6 $\pm$ 10.4	82.1 $\pm$ 8.5	<0.001
School Functioning	57.9 $\pm$ 8.1	80.7 $\pm$ 9.1	<0.001
Total HRQoL Score	58.6 $\pm$ 7.5	81.3 $\pm$ 6.9	<0.001

Adolescents with psychological morbidities had significantly lower HRQoL across all domains.

Table 4: Association Between GFD Adherence and Psychological Morbidities

GFD Adherence	Psychological Morbidity (%)	p-value
Good (n=61)	16 (26.2%)	
Partial (n=26)	15 (57.7%)	
Poor (n=13)	11 (84.6%)	<0.001

Poor dietary adherence was significantly associated with increased psychological morbidity.

Table 5: Parent-Reported vs. Self-Reported PedsQL Scores

Domain	Parent Report	Self Report	p-value
Total HRQoL Score	68.9 $\pm$ 10.2	71.4 $\pm$ 9.6	0.12
Emotional Functioning	63.2 $\pm$ 9.4	66.1 $\pm$ 8.7	0.08

Minor differences were observed between self-reported and parent-reported quality of life, with parents slightly underestimating emotional impact.

DISCUSSION

This study highlights the substantial psychological burden and compromised health-related quality of life (HRQoL) in adolescents with celiac disease (CD). Our findings indicate that over one-third of adolescents with CD experience symptoms of anxiety and depression, significantly correlating with lower HRQoL across physical, emotional, social, and school domains.

This is consistent with previous studies reporting high psychological comorbidity in pediatric CD populations. A recent study by Ludvigsson et al. found that adolescents with CD experience anxiety and depression at higher rates than their healthy peers, often persisting despite adherence to a gluten-free diet (GFD) (10). Similarly, Addolorato et al.

demonstrated that untreated CD was associated with elevated psychological distress, particularly in adolescents facing social restrictions related to dietary limitations (11).

The negative impact of CD on HRQoL is well documented. Similarly, one study reported significantly lower emotional and social functioning scores among adolescents with CD compared to healthy controls (5). Social avoidance, fear of accidental gluten ingestion, and feelings of being different from peers can contribute to emotional withdrawal and impaired peer relationships (2). This emotional burden is often compounded by the need for strict dietary compliance, which may lead to reduced participation in school and social activities.

Importantly, our study confirms that poor GFD adherence is significantly associated with higher rates of psychological morbidity. Adolescents who did not adhere to the diet reported greater anxiety and depressive symptoms. This reflects earlier findings by Häuser et al., who noted that dietary adherence improved psychological symptoms and HRQoL in adults with CD (6). Conversely, non-adherence has been linked to increased risk of persistent symptoms, school absenteeism, and psychosocial dysfunction (8).

Notably, we also observed a slight discrepancy between self-reported and parent-reported HRQoL scores, particularly in the emotional and social domains. This suggests that parents may underestimate their children's psychological struggles (7). This discrepancy underscores the importance of involving adolescents directly in discussions about their psychological health.

Given the psychosocial complexities of managing CD in adolescence, routine mental health screening should be incorporated into follow-up visits. Tools such as the Pediatric Symptom Checklist (PSC-Y) and the Pediatric Quality of Life Inventory (PedsQL) offer structured, validated approaches to assess emotional well-being in chronic illness contexts (9). Early detection of distress can guide timely referral to psychologists or counselors and improve long-term adherence and quality of life.

Multidisciplinary care—including gastroenterologists, dietitians, psychologists, and school counselors—is essential for supporting adolescents with CD. Educational interventions targeting caregivers and school staff can foster environments that reduce stigma, improve dietary compliance, and enhance emotional resilience (4).

CONCLUSION

Adolescents with celiac disease face a substantial burden of psychological morbidities, particularly anxiety and depression, which significantly impair their health-related quality of life across physical, emotional, social, and academic domains. Poor adherence to the gluten-free diet was strongly associated with increased psychological distress and reduced quality of life. These findings underscore the importance of addressing mental health as an integral component of comprehensive celiac disease management in adolescents.

Recommendations

Routine psychological screening should be incorporated into the follow-up care of adolescents with celiac disease using validated tools such as the PSC-Y and PedsQL. A multidisciplinary care approach involving pediatricians, dietitians, and mental health professionals is essential for early identification and management of psychological morbidities. Educational support for families, peer counseling, and targeted interventions to improve dietary adherence may help mitigate emotional distress and enhance overall quality of life in this vulnerable population.

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