

THE RELATIONSHIP BETWEEN MENTAL HEALTH AND FUNCTIONAL CONSTIPATION AMONG ADOLESCENTS

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ABSTRAK

Konstipasi adalah masalah pencernaan umum yang terbagi menjadi primer (fungsional) dan sekunder. Konstipasi fungsional ditegakkan dengan kriteria Rome IV, meliputi gejala seperti mengejan, tinja keras, defekasi tidak tuntas, dan sensasi sumbatan anorektal. Remaja, sebagai fase transisi pubertas, rentan terhadap masalah kesehatan mental yang dapat memengaruhi pencernaan. Penelitian ini bertujuan menganalisis hubungan mental health dan konstipasi fungsional pada 308 siswa kelas X SMA Negeri 1 Surakarta (10 Oktober 2024) dengan desain cross-sectional. Variabel bebas adalah mental health (red flag question Rome IV), sedangkan variabel terikat konstipasi fungsional (Rome IV dan BSFS). Analisis Chi-Square menunjukkan hubungan signifikan antara depresi dan konstipasi fungsional ($p=0.006$; OR 4.09; CI 95% 1.403–11.913). Kondisi psikologis terbukti memicu konstipasi, sehingga deteksi dini, pencegahan, serta konseling bersama orang tua, guru, dan tenaga kesehatan penting untuk meningkatkan kualitas hidup remaja.

ABSTRACT

The Relationship between Mental Health and Functional Constipation among Adolescents. Constipation is a common digestive problem that is divided into primary (functional) and secondary. Functional constipation is diagnosed using the Rome IV criteria, which include symptoms such as straining, hard stools, incomplete defecation, and a sensation of anorectal obstruction. Adolescents, as a transitional phase of puberty, are vulnerable to mental health problems that can affect digestion. This study aimed to analyze the relationship between mental health and functional constipation in 308 grade 10 students of SMA Negeri 1 Surakarta (October 10, 2024) using a cross-sectional design. The independent variable was mental health (the Rome IV red flag question), while the dependent variable was functional constipation (Rome IV and BSFS). Chi-square analysis showed a significant association between depression and functional constipation ($p=0.006$; OR 4.09; 95% CI 1.403–11.913). Psychological conditions have been shown to trigger constipation, so early detection, prevention, and counseling with parents, teachers, and health professionals are important to improve the quality of life of adolescents.

INTRODUCTION

Constipation is a common gastrointestinal problem in the pediatric population. Functional constipation is diagnosed on the basis of Rome IV criteria, which are defined as the presence of two

or more symptoms, such as straining during defecation, hard stools, incomplete defecation, and sensation of anorectal blockage. Children may also experience a decreased appetite, feel full quickly, or become irritable; however, these symptoms commonly subside after passing a large stool.¹⁻⁴

Functional constipation (FC), as defined by the Rome IV criteria, affects approximately 14.4% of the pediatric population worldwide.⁵ A systematic review and meta-analysis by Djurijanto, which included 50 pediatric studies from Asian countries, reported a prevalence of functional constipation (FC) based on the Rome IV criteria of 9.2%.⁶ A study by Kadim M in 2021, conducted in Indonesia, revealed that 20% of Indonesian children suffer from functional constipation (FC).⁴ Based on data from the 2023 Indonesian Health Survey, 2% of 130,977 people aged 15-24 years old experienced depression, and it is estimated that more than 19 million adolescents over the age of 15 experience emotional mental disorders, while more than 12 million of them suffer from depression.⁷ Stressful psychological trauma, anxiety, and depression increase the risk of diseases, including gastrointestinal disorders such as constipation.⁶ Failure to address mental health issues experienced during adolescence can continue into adulthood, adversely affecting physical and psychological health.^{6,8}

Adolescence is a transitional period that is vulnerable to emotional and social pressures, including academic pressure, social relationships, and hormonal changes. Adolescents must be able to adapt to many changes to minimize problems with mental health or psychological well-being. Anxiety and depression are the most common mental health disorders.^{5,9,10} In the early stages of depression, adolescents generally show symptoms such as irritability, feeling depressed, loss of enthusiasm, feeling sad, and experiencing conflicts with friends and family. Several factors contribute to depression, including genetics, biological conditions, hormones, family or environmental influences, and social and cultural elements. Risk behaviors begin when adolescents experience early symptoms of depression, prolonged stress, and challenges or difficulties in their daily activities.¹⁰

The gut-brain axis is a bidirectional communication pathway between the gut and the brain, playing a crucial role in regulating both physiological and psychological functions. The gut microbiota contributes to this communication by producing microbial metabolites that influence neural function, regulate neurotransmitters, and modulate stress responses. An imbalance in the microbiota (dysbiosis) can disrupt the production of these metabolites, triggering neuroinflammation and dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis, leading to the development of neuropsychiatric disorders such as depression and anxiety.^{11,12}

Most earlier studies have focused on dietary and lifestyle factors, as well as some digestive problems, such as diarrhea and dyspepsia. However, depression has not been studied much. Limited mental health screening and insufficient multidisciplinary research further restrict the availability of local data on the comorbidity of depression and constipation. We performed a study to determine the correlation between depression and functional constipation among adolescents. In order to improve our understanding of both mental health and functional constipation.

METHODS

A quantitative, cross-sectional, analytical study was conducted among students of SMA 1 Surakarta, Indonesia, in October 2024. The purposive sampling technique was employed to select a sample that met the study requirements, ensuring a homogeneous sample and minimizing potential confounding factors related to gastrointestinal or psychological conditions. We only included the

students who agreed to participate in the study by signing informed consent. Students with a diagnosed digestive disease, a history of surgery, and those who had received laxative therapy in the last 7 days were excluded from the study. The independent variable was mental health, assessed using the Rome IV questionnaire, including "red flag questions" related to mental health status. The dependent variable was functional constipation, measured using the Rome IV Criteria and the Bristol Stool Form Scale (BSFS). We analyzed the validity and reliability of the data, and then performed univariate analysis to describe the study subjects' characteristics and bivariate analysis to examine the relationship between the two variables. The statistical significance was set at $p < 0.05$. All data were statistically analyzed with SPSS 26. Research ethics included informed consent, anonymity, confidentiality, and ethical eligibility. Ethical approval was obtained from the Health Research Ethics Committee of Dr. Moewardi General Hospital, Surakarta, under the number: 2.327/IX/HREC/2024.

RESULTS

Table 1 presents the characteristics of the study subjects. Three hundred and eight students were included in the study. The subjects were predominantly female (60.1%). Only 11.7% of subjects had constipation, and a mental health problem (depression) was observed in 68.8% of subjects.

Table 1. The characteristics of the study subject

Characteristic	Frequency (n)	Percent (%)
Sex		
Male	123	39.9
Female	185	60.1
Age		
14 – 15 y.o	223	72.4
16 – 18 y.o	85	27.6
Constipation		
Yes	36	11.7
No	272	88.3
Mental health problem (Depression)		
Yes	212	68.8
No	96	31.2

Table 2 presents the result of the bivariate analysis, which obtained a statistically significant correlation between depression and functional constipation ($X^2 = 7.644$; $p = 0.006$; $OR = 4.09$; $CI\ 95\% 1.403 - 11.913$). Subjects with depression were four times more likely to suffer from functional constipation than those who had no depression. These findings highlight the meaningful relationship between mental health status and gastrointestinal symptoms in adolescents.

Table 2. The Bivariate Analysis

Variable	Constipation				Total		p	X ²	OR	CI	
	Yes		No							Upper	Lower
	N	%	N	%	N	%					
Mental health problem (Depression)											
Yes	32	10.4	180	58.4	212	68.8	0.006	7.644	4.09	1.403	11.913
No	4	1.3	92	29.9	96	31.2					

DISCUSSION

Functional constipation is one of the most common gastrointestinal disorders in children and adolescents. Early detection is crucial so that treatment can be initiated promptly and appropriately, thereby improving the prognosis. Therefore, understanding the pathophysiology of functional constipation is very important for supporting optimal treatment.^{2,13} Additionally, stressful life events are closely linked to the development of constipation.¹⁴

Of the total 308 subjects in our study, only 36 of them experienced functional constipation. We found that subjects with health issues, namely depression, had a fourfold increase in the occurrence of constipation. The brain–gut–microbiota axis functions as a bidirectional communication system, in which gastrointestinal microorganisms can influence the central nervous system. At the same time, the central nervous system also sends signals back to the gut. Various factors can modulate the activity of this microbiota–gut–brain axis, including diet, genetic predisposition, medication use, environmental conditions, physical activity, cognitive responses, stress, and social interactions.¹² These maladaptive emotional and behavioral responses may disrupt gut-brain axis communication, impair mucosal integrity, and slow colonic transit, resulting in a self-perpetuating cycle between psychological distress and gastrointestinal symptoms. Persistent gastrointestinal discomfort may induce heightened stress, anxiety, and emotional dysregulation, thereby worsening FGID severity.³ A meta-analysis of 15 studies presents 1,200 adolescents found that those with depression had significantly lower gut microbiota α -diversity compared to healthy peers.¹¹

Psychosocial factors such as somatization, inadequate coping strategies, anxiety, and depression are among the contributing factors to the development of functional gastrointestinal diseases (FGIDs), including constipation.^{1,2,13} The children with chronic constipation experience higher levels of anxiety than children without constipation.¹⁵ Similarly, a cross-sectional survey conducted by Tran et al. in 2023, involving 4 districts in Sri Lanka, found that 60 adolescents out of 913 respondents experienced functional constipation. Adolescents who experienced stress and anxiety had a higher chance of experiencing functional constipation (Odds Ratio = 2.52, $p < 0.0001$).¹⁶ The incidence of constipation was significantly higher among respondents who experienced stress, particularly those related to family and school issues.¹⁷ However, this relationship is an association, so the direction of causality between depression and functional constipation cannot be determined given the cross-sectional study design.¹²

Compared to healthy children, children with constipation experience social problems, anxiety, and disturbed sleep patterns. Previous studies revealed that sleep disorders are associated with functional constipation, and systematic reviews and meta-analyses support these findings. It has been indicated that sleep disorders can trigger physical and mental disorders in individuals with

constipation.^{14,18} The hypothalamic-pituitary-adrenal (HPA) axis may become more active in response to sleep disorders, potentially affecting intestinal motility and increasing visceral sensitivity.

Moreover, children and adolescents who have functional constipation often meet daily challenges that can lead to stress and make their symptoms worse if treatment fails. Stress, depression in low-income communities, and unhealthy ways of coping with problems can create a cycle in which gut issues and emotional problems reinforce each other. This highlights the need for a comprehensive treatment approach that addresses both the physical and mental aspects of the condition.¹⁴

Based on these results, it is essential to adopt a biopsychosocial approach in treating functional constipation in adolescents. Not only medical techniques, such as dietary changes and pharmacological therapy, but also psychological interventions, such as counseling and stress management, need to be integrated into the management plan. A deep understanding of the relationship between psychological factors and gastrointestinal symptoms will help healthcare providers provide more comprehensive and effective treatment.^{19–21}

This study was limited by its design; the cross-sectional study design did not allow researchers to identify causal relationships between the variables studied. Use of a depression screening tool has limitations, as it cannot wholly replace clinical assessment and diagnosis. Therefore, while analyzing the study results, the possibility of misclassification should be considered. This study employed a questionnaire, which may have led to response bias, including subjectivity in respondents' answers. It is hoped that future studies will involve a broader, more diverse sample, including students from various grades, multiple schools, and different regions. The use of a longitudinal or cohort design to evaluate cause-and-effect relationships, combined with a range of data collection methods, such as interviews or clinical observations, will minimize subjective response bias and yield more comprehensive data.

CONCLUSION

This study indicates a significant correlation between adolescent mental health and functional constipation. Psychological stress can trigger digestive complaints, particularly functional constipation. Therefore, it is essential to prevent and detect psychological problems and symptoms of constipation in adolescents through collaboration with parents, teachers, peers, and health workers, and facilitating counseling to prevent mental disorders and constipation can improve the quality of life of adolescents.

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