



Anxiety Level of Mothers of Children Aged Under Four with Functional Constipation

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ABSTRACT

Objective: The aim of this study was to investigate the relationship between functional constipation in young children and their mothers' symptoms of anxiety, with an assessment of demographic characteristics.

Materials and Methods: Sixty patients aged <4 years with constipation diagnosed based on the Rome IV criteria and 45 healthy children aged <4 presented for follow-up visits between January 2021 and May 2021, and their mothers were included in the study. The mothers were interviewed in a face-to-face meeting and completed a sociodemographic data form, the Beck Anxiety Inventory, and the State-Trait Anxiety Inventory.

Results: The number of children in the patient group whose mothers had a primary or secondary education level was significantly higher when compared with the control group ($p=0.017$). The patient group also had a larger number of mothers who did not work outside the home and were the primary caregiver ($p<0.001$; $p<0.001$). The mothers of the patient group had significantly higher scores on all of the assessments (Beck Anxiety Inventory, State Anxiety Inventory, and Trait Anxiety Inventory) ($p<0.001$; $p=0.004$; $p=0.004$).

Conclusion: The anxiety of the mother may influence the development of constipation in children, and constipation may also increase the mother's anxiety. Incorporating psychosocial support for the family might be helpful in the treatment of functional constipation in young children.

Keywords: Anxiety, anxiety inventory, children, functional constipation, mother and child

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INTRODUCTION

Constipation is a common problem in childhood. It usually has no significant underlying physiological cause. Observation of at least 2 of the Rome IV criteria for a period of 1 month is typically used to diagnose functional constipation in children under the age of 4 years: 2 or fewer defecations per week, history of excessive stool retention, history of painful or hard bowel movements, history of large-diameter stools, or the presence of a large fecal mass in the rectum (1). The global prevalence of functional constipation in children is estimated to be 3% (2).

The etiology of functional constipation in children may be related to various factors, such as heredity, economic level of the family, nutritional habits, physical activity, education level of the parents, voluntary delay of defecation after a painful stool, not eating due to fear of a painful bowel movement, and difficulty in school or communicating with friends and parents (2, 3).

Increased recognition of the importance of the relationship between physical and mental health has led to more investigation of functional constipation and the potential relationship to psychological status. Particularly in infancy, when the mental apparatus has not yet fully developed, infants and young children can only express stress, discomfort, or distress physically, and the mental well-being of the mother, who is often the individual most frequently in close contact with a young child, can have an influence on the child's mental structure and physical symptoms (4).

Parents affect the emotional and physical development of the child in many ways. A meta-analysis found that children who had a parent with a mental illness had a greater risk of physical illness throughout childhood (5). Research has also suggested that a high stress level in a caregiver may be associated with somatization in children (6). Though some studies have examined a psychological aspect of the etiology of functional constipation, there are very few that have examined the mental state of parents, specifically of young children who cannot yet communicate verbally (7).

The objective of this study was to contribute to the literature by assessing the demographic characteristics of children aged <4 years who had been diagnosed with functional constipation and to investigate the relationship between constipation and the mother's level of anxiety.

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MATERIALS and METHODS

Ethical approval for this study was obtained from the Kastamonu University Clinical Research Ethics Committee on December 14, 2020 (no: 2020-KAEK-143-07.01).

The research was designed as a prospective, cross-sectional study. Sixty patients aged <4 years who were presented at the pediatrics and pediatric surgery polyclinic of the Kastamonu Training and Research Hospital and were diagnosed with functional constipation based on the Rome IV criteria between January 2021 and May 2021, 45 healthy children of the same age group, and their mothers were included in the study. Nine patients who had constipation due to an organic cause, had neurological problems, or did not meet the diagnostic criteria were excluded. If the mother had received psychiatric treatment for any reason in the past, they were also excluded from the study. Details recorded using a sociodemographic data form (Table 1), and results of the Beck Anxiety Inventory (BAI) (Table 2) and the State-Trait Anxiety Inventory (STAI) (Table 3, 4) completed by the mothers in face-to-face interviews are provided.

Measurements

A sociodemographic data form prepared by the researchers was used to collect clinical and basic characteristic data. Clinical assessment tools were used to evaluate anxiety level.

Beck Anxiety Inventory

The BAI is a self-report scale developed by Beck to assess clinical anxiety and to discriminate anxious and nonanxious diagnostic groups based on anxiety symptoms experienced within the previous week (8). Ulusoy et al. (9) conducted a validity and reliability study of a Turkish version of the scale (test-retest reliability coefficient $r=0.57$). The findings indicated that the scale could be used to evaluate and treat anxiety. Each of 21 items is scored using a Likert-type scale value of 0 (not at all) to 3 (severely). The highest possible score is 63, and a higher score indicates greater severity of anxiety. Physiological symptoms are assessed in 13 items, while 5 items describe cognitive aspects of anxiety, and 3 items represent both somatic and cognitive symptoms.

State-Trait Anxiety Inventory

The STAI, originally developed in 1970, was evaluated for use with a Turkish population by Öner and Le Compte (10).

The STAI assesses 2 forms of anxiety. The State Anxiety Form (STAI-S or STAI-1) measures temporary anxiety, while the Trait Anxiety Form (STAI-T or STAI-2) measures the general level of anxiety in the personality structure. Each form uses a 4-point Likert type scale to score 20 items. The scale for S-anxiety is 1) not at all, 2) somewhat, 3) moderately so, 4) very much so. The scale for T-anxiety is 1) almost never, 2) sometimes, 3) often, 4) almost always, based on the frequency of the feelings, thoughts, or behaviors expressed in the item. Ten statements are reverse scored (items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20) in the STAI-S and 7 in the STAI-T (items 21, 26, 27, 30, 33, 36, and 39). Scores range between 20 and 80, and a higher score is associated with greater anxiety.

Table 1. Demographic characteristics questionnaire

1. How old are you?		
2. What is the birthdate of this child?/...../.....		
3. What is the gender of this child?		
4. How many children do you have?		
5. How many people live in your home?		
6. Describe where you live	a) Urban	b) Village/rural
7. What is your education level?	a) Primary school graduate	b) Secondary/middle school graduate
	c) High school graduate	d) University graduate
8. Are you currently employed?	a) No	b) Yes
9. Do you have a chronic disease? If so, what is it?		
10. Do you use any daily medication? If so, what is it?		
11. Have you ever been treated at a psychiatric clinic?	a) Yes	b) No
12. Have you ever used psychiatric drugs?	a) Yes	b) No
13. What type of toilet do you use at home?	a) Squat toilet	b) European style
		c) Both
14. Who looks after this child during the day?	a) Mother	b) Other
15. Is this child toilet trained/have stool control?	a) Yes	b) No

Statistical Analysis

The following sample size formula was used: $n = Z^2 P(1 - P) / d^2$ where n =sample size, Z =Z statistic for a level of confidence of 95%, P =expected prevalence or proportion (prevalence of constipation is 3%), and d =precision (11). As a result, a sample size for a Mann-Whitney U test was a minimum of 45 in each group. G*Power analysis of this sample size yielded statistical power analysis results of 0.7 effect size, 0.05 alpha, and 0.95 power.

The data were analyzed using IBM SPSS Statistics for Windows, Version 20.0 software (IBM Corp., Armonk, NY, USA). Quantitative variables were expressed as the median, while categorical variables were expressed as numbers and percentages. Quantitative variables were investigated using the Mann-Whitney U test and categorical variables were examined using a chi-squared test. The level of statistical significance was $p < 0.05$.

RESULTS

Of the 105 cases included in the study, 60 (57.1%) were patients and 45 (42.9%) were the healthy control group. Males comprised 55% of the patient group and 42% of the control group. There was no significant difference in terms of disease presence according to sex. The mean age of the patient group was 28.47 ± 10.220 months and the mean age of the control group was 28.47 ± 10.455 months. The mean age of the mothers of the patient group was 32.03 ± 4.483 years, while the mean age of the mothers of the control group was

Table 2. Beck Anxiety Inventory (BAI)

	Not at all	Mildly, but it didn't bother me much	Moderately - it wasn't pleasant at times	Severely - it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky/unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint/lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3

Above is a list of common symptoms anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom

32.03±3.268 years. No significant difference was observed between the groups based on age ($p=0.292$, $p=0.087$). Of the study group, 82.8% of the children were urban residents. The educational status of the mothers of 72.4% of the study group was high school or above; however, there were significantly more mothers with only a primary or secondary education level in the patient group compared with the control group ($p=0.017$). It was also determined that the number of mothers who did not work outside the home and were the primary caregiver was higher in the patient group ($p<0.001$, $p<0.001$). Among the patient group, 64.8% of the children had not yet been toilet-trained. However, this factor yielded no significant difference in terms of constipation ($p=0.194$). The distribution of the descriptive characteristics of the patients is presented in Table 5.

The median score of the mothers of the children in the patient group of the BAI, STAI-S, and STAI-T was 7.0 (min-max: 0–42), 38.5 (min-max: 20–51), and 44.0 (min-max: 45–53), respectively, which were significantly higher than those of the mothers in the control group in all 3 assessments ($p<0.001$, $p=0.004$, $p=0.004$) (Table 6).

DISCUSSION

In our study, the mothers of children with functional constipation demonstrated a higher BAI level of anxiety than mothers in the healthy control group, as well as higher STAI indications of situational and structural anxiety. Constipation was seen more often in the children of mothers who did not work outside the home and were the primary caregiver.

Constipation is a common problem in childhood. For most children, it is temporary and functional in nature, rather than due to a secondary cause. It can present with infrequent, painful, or incomplete defecation, or stool retention (12). Defecation problems may start before or during toilet-training and can become more pronounced over time. This study evaluated children under the age of 4, an age group that is developing physically and psychologically, yet still dependent on an adult for care.

Functional constipation can occur in both sexes and in children of different socioeconomic backgrounds, dietary habits, cultural influences, and other variables. The evidence available to date about the causes, diagnosis, and treatment remains limited, but suggests that the condition is both common and perhaps more complex than initially understood (1). Our results revealed also no significant difference based on sex.

A study that assessed nearly 1500 children under the age of 4 to investigate the use of completed toilet training as a criterion in the diagnosis of functional constipation noted a greater prevalence in children who were toilet trained (13). The authors noted that this may reflect the emergence of complaints in conjunction with age and toilet training experience. In contrast, our results did not indicate a difference in the occurrence of functional constipation based on toilet training; however, training status was not examined in detail.

We found that functional constipation was less common among children of working mothers and mothers with a higher educational status. Similarly, other studies have noted a lower rate

Table 3. State Anxiety Inventory (STAI-1)

	Not at all	Somewhat	Moderately so	Very much so
I feel calm	1	2	3	4
I am secure	1	2	3	4
I am tense	1	2	3	4
I feel strained	1	2	3	4
I feel ease	1	2	3	4
I feel upset	1	2	3	4
I am presently worrying over possible misfortunes	1	2	3	4
I feel satisfied	1	2	3	4
I feel frightened	1	2	3	4
I feel comfortable	1	2	3	4
I feel self-confident	1	2	3	4
I feel nervous	1	2	3	4
I am jittery	1	2	3	4
I feel indecisive	1	2	3	4
I am relaxed	1	2	3	4
I feel content	1	2	3	4
I am worried	1	2	3	4
I feel confused	1	2	3	4
I feel steady	1	2	3	4
I feel pleasant	1	2	3	4

A number of statements which people have used to describe themselves are given above. Read each statement and then circle the appropriate number to the right of the statement to indicate how you fell right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best

Table 4. Trait Anxiety Inventory (STAI-1)

	Almost never	Sometimes	Often	Almost always
I feel pleasant	1	2	3	4
I feel nervous and restless	1	2	3	4
I feel satisfied with myself	1	2	3	4
I wish i could be as happy as others seem to be	1	2	3	4
I feel like a failure	1	2	3	4
I feel rested	1	2	3	4
I am “calm, cool, and collected”	1	2	3	4
I feel that difficulties are piling up so that i cannot overcome them	1	2	3	4
I worry too much over something that really doesn’t matter	1	2	3	4
I am happy	1	2	3	4
I have disturbing thoughts	1	2	3	4
I lack self-confidence	1	2	3	4
I feel secure	1	2	3	4
I make decisions easily	1	2	3	4
I feel inadequate	1	2	3	4
I am content	1	2	3	4
Some unimportant thought runs through my mind and bothers me	1	2	3	4
I take disappointments so keenly that i can’t put them out of my mind	1	2	3	4
I am steady person	1	2	3	4
I get in a state of tension or turmoil as i think over my recent concerns and interests	1	2	3	4

A number of statements which people have used to describe themselves are given above. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel

Table 5. Descriptive characteristics

	Patient	Control	p	N
Age of mother (years)	32.03+4.483	30.67+3.268	0.087	
Age of child (months)	28.47+10.220	26.31+10.455	0.292	
Sex				
Male	33	19	0.195	52
Female	27	26		53
Residence				
Urban	48	39	0.37	87
Rural	12	6		18
Number of children				
≤2	46	39	0.197	85
>2	14	6		20
Number of residents in the home				
≤4	42	39	0.044	81
>4	18	6		24
Educational status of the mother				
Primary or secondary school	22	7	0.017	29
High school or university	38	38		76
Employment status of the mother				
Employed	10	21	<0.001	74
Housewife	50	24		31
Primary daytime caregiver				
Other than mother	8	19	<0.001	27
Mother	52	26		78
Toilet training				
Yes	18	19	0.194	37
No	42	26		68
Type of toilet used				
Squat toilet	12	7	0.047	19
European-style	12	19		31
Both	36	19		55

Independent samples t-test; chi-squared test; p<0.05

among children of working mothers (7, 14). One explanation that has been proposed is that the socioeconomic level of families with working mothers may be better, which may have a positive impact on lifestyle and dietary habits (14).

In our study, the mothers of children with functional constipation demonstrated a high level of anxiety. Specific cause and effect relationships between maternal anxiety and constipation in children remain unclear; however, it has been noted in studies examining recurrent abdominal pain in children that mothers with overprotective behavior may reinforce illness behavior (15) and it was reported in a meta-analysis of 13 studies that overprotective behavior was associated with a high maternal anxiety level (16). The literature findings and our results of a high STAI-T level in the mothers in our study suggest that there may be a relationship between a high anxiety level in the primary caretaker and constipation in children.

Research related to the psychological state of parents of children with functional constipation is limited; however, in a study investigating family dynamics, it was revealed that stressful events such as divorce, migration, death, and psychological trauma in the family were more common in the patient group (17). Parenting attitudes and techniques have also been reported to be associated with functional constipation (18). Primary caregivers with a high anxiety level may inadvertently convey this to their children, and the children may express it in the form of physical symptoms, such as constipation, particularly those aged under 4 years.

Our study has several limitations. First, the specific data related to the timing and completion of toilet training limited precise analysis of outcomes before and after toilet training. In addition, the fact that the research was based on admissions to a single hospital restricts generalization of the findings. Third, the mothers were not

Table 6. Comparison of mothers' Beck Anxiety Inventory and State-Trait Anxiety Inventory scores

	N	Mean rank	U	p
BAI				
Patient	60	61.62	833.0	<0.001
Control	45	41.51		
STAI-1				
Patient	60	60.42	905.0	0.004
Control	45	43.11		
STAI-2				
Patient	60	60.33	910.0	0.004
Control	45	43.22		

Mann-Whitney U test; p<0.05; BAI: Beck Anxiety Inventory; STAI-1: State Anxiety Inventory; STAI-2: Trait Anxiety Inventory

given psychosocial support; analysis of the results after such support could be useful. Finally, influences in the etiology of functional constipation may vary based on hereditary factors, which were not excluded in this study and could provide useful comparison data.

CONCLUSION

There may be a relationship between high anxiety in the mother/primary caretaker and constipation in young children that may result in a cycle of mutual distress. A high anxiety level in the mother may contribute to constipation in a child, and chronic constipation may add to the anxiety level of the mother and have an effect on attachment and the family dynamics, among other effects. Additional research that considers psychoeducation for families, treatment for existing anxiety disorder, and evaluation of the results will be valuable. In addition, further examination of anxiety-related overprotective behavior may also provide helpful guidance for the treatment of children with functional constipation.

Ethics Committee Approval: The Kastamonu University Clinical Research Ethics Committee granted approval for this study (date: 14.12.2020, number: 2020-KAEK-143-07.01).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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