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Predicting Body Image Concern and Anxiety of Children based on Family Functioning and Communication Patterns of Parents of Students with Onychophagia

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Abstract

Background: *Nail-biting can result in both physical and psychological consequences including emotional distress, anxiety, and depression. The study aimed to forecast the extent of concern regarding body image and anxiety in children by examining the family dynamics and communication styles of parents whose students have nail-biting habits in elementary schools in Tehran.*

Methods: *The present study utilized descriptive and causal-correlational methodologies through regression analysis. The research participants are girls in the sixth grade who are enrolled in a primary school in the 6th district of Tehran in 2022, as well as their parents. 160 individuals were chosen through a combination of convenience and purposive sampling methods. The sample consisted of around 80 students and 80 parents. Data collection involved four standardized questionnaires related to The Body Image Concern Inventory, The Spence Children's Anxiety Scale-Parent Version (SCAS-P), The Communication Patterns Questionnaire (CPQ), and The McMaster Family Assessment Device (FAD). After collecting data, the study utilized descriptive statistics (age, gender, education level) and regression analysis. The data analysis was conducted using SPSS 23 software.*

Results: *The findings showed a significant connection between family dynamics and body image concerns (P-value<0.01). The correlation coefficient of r=-0.736 indicates a strong negative relationship between students' body image concerns and family dynamics. Likewise, the study revealed a notable link between parents' communication styles and body image concerns (r=0.860). A greater emphasis on communication by parents is associated with a reduction in students' body image concerns, demonstrating a strong negative relationship between these factors (P-value<0.01).*

Conclusions: *It is suggested that primary schools improve communication with parents of students who are dealing with anxiety, body image issues, and nail-biting habits to effectively help them overcome these challenges.*

Keywords: Concern of Body Image, Anxiety, Family functioning, Communication patterns, Parents, Students, Onychophagia.
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Introduction

Onychophagia, also known as nail biting, is a chronic condition characterized by repetitive and compulsive behavior. While it is frequently observed in children and adults, there is a lack of comprehensive studies on its prevalence. Literature reviews suggest that various stress-inducing factors can worsen nail-biting, with some attributing the disorder to underlying anxiety or impulsive behaviors. Additionally, some researchers propose that nail biting may serve as a means of seeking attention in younger individuals[1]. The nail-biting often begins as a response to anxiety, intense stress, or tension but can develop into a habit over time. Despite the original triggers fading, the habit may persist. Failing to address and manage nail biting in childhood increases the likelihood of it persisting into adulthood. Studies indicate that nail-biting affects 20-33% of children and 45% of adolescents[2].

Anxiety disorders encompass feelings of concern, excessive anxiety, and associated behavioral disturbances. The concern is an emotional reaction to a present or potential threat, whereas anxiety involves worry about a future threat. Individuals with anxiety disorders exhibit a subconscious inclination towards stimuli perceived as threatening, leading to heightened sensitivity toward concern-inducing triggers[3]. The occurrence of nail-biting disorder can be influenced by various factors, one of which is concern about body image. Body image concern is a physical disorder where individuals are constantly anxious about an exaggerated or imaginary flaw in their appearance, typically focused on their face, leading to behaviors like checking their appearance in the mirror frequently and trying to conceal or correct the perceived flaw[4], research has shown that concerns about body image are present in all genders. In terms of physical appearance, women are often focused on weight loss while men strive for a muscular physique[5].

Feeling unhappy with one's body image occurs when an individual compares their appearance to an ideal body type defined by society and realizes they do not match it. Research shows a strong connection between body image dissatisfaction and anxiety, indicating that those with anxiety are more prone to feeling unhappy with their bodies[6]. Body image encompasses a person's thoughts, perceptions, and attitudes towards their appearance, affecting how they feel about their looks and their overall body. Negative body image can have detrimental effects on a person's well-being, leading to distress and attempts to alter their appearance. Studies have shown that teenagers who are dissatisfied with their bodies are more likely

to engage in unhealthy behaviors such as dieting and strict control over their eating habits[7].

The way families communicate can impact children's behavior and nail-biting habits. Family communication patterns theory is a framework used to assess the role of communication within families. This theory introduces a two-dimensional model (conversation orientation, conformity orientation) and a four-category classification of family communication styles, shedding light on how typical communication behaviors develop in a family setting. Given that the family is a key social influence on children's upbringing, the connection between family communication patterns and interactions with students remains an area yet to be thoroughly researched. Family relationships are crucial for people's lives, serving as long-lasting social institutions[8]. As communication is a central element in family dynamics and a means of socializing family members, it is essential to analyze social interactions within families and their impact on various outcomes. The theory of family communication patterns has greatly contributed to the understanding of familial interactions, positing that families communicate through specific orientations to establish a shared social reality[9].

Although nail-biting may seem like a minor issue, it has deep-seated causes and implications that can be explored through meditation to find a solution. Research indicates that nail-biting affects 20-30% of the general population[1,10], with a higher prevalence among children, as one study found a 37% incidence rate in individuals aged 3 to 21[11]. Another study revealed that nearly half of students habitually bite their nails in various situations [12]. Based on these findings, the primary focus of this study is to investigate whether children's concern about body image and anxiety can be predicted by analyzing the family functioning and communication patterns of parents, specifically in 6th-grade students with nail-biting habits within District 6 of Tehran city. Since there is limited research on predicting children's anxiety and body image concerns solely based on parental communication patterns and family functioning, this research aims to address this gap and offer solutions to alleviate anxiety among sixth-grade students in District 6 of Tehran.

Materials and Methods

The present study utilized descriptive and causal-correlational methodologies through regression analysis. The research participants are girls in the sixth grade who are enrolled in a primary school in the 6th district of Tehran in 2022, as well as their parents. 160 individuals were chosen through a combination of convenience and purposive sampling methods. Following the guidelines of Morgan's table, the study included a statistical sample size of 80 students with nail-biting disorder and 80 of their parents, resulting in 160 participants. Students eligible to participate in the study had to have a nail-biting habit for at least six months, resulting in significant finger injuries and a compulsive and repetitive tendency to bite their nails. The conditions for discontinuing participation in the study were either not completing the required questionnaire or refusing to continue filling it out.

The first step in data collection involved obtaining permission from the university and reaching out to school principals in the 6th district of Tehran. Because of the coronavirus in the country and the closure of schools, the most efficient method of data collection was online. Consequently, online surveys were developed, and the survey links were sent to school administrators to share with students in the study groups, along with instructions on how to complete the survey. Initially, students were instructed to notify their parents about the survey, as it focuses on children with nail-biting disorder. Then parents were asked if their child had this condition. If the answer is affirmative, researchers requested to complete the survey. By meeting certain criteria and upon the approval of their teacher and school health officer, the students filled out surveys on body image concerns, parents' communication styles, and family dynamics. In contrast, the mothers completed surveys on their children's anxiety levels. After collecting data, the study utilized descriptive statistics (age, gender, education level) and regression analysis. The data analysis was conducted using SPSS 23 software.

The Body Image Concern Inventory[13]: The inventory is a 19-item self-report measure designed to assess dysmorphic appearance concerns. For each item, individuals indicate how often they have the described feeling or perform the described behavior on a 5-point Likert scale bounded by 1 (*never*) and 5 (*always*). The questionnaire's scores range from 19 to 95. The target participants for this questionnaire are female sixth-grade students from the 6th district of Tehran, aged around 12 years. Ghadakzadeh et al (2011) validated this test with a 95 percent internal consistency using Cronbach's alpha method in their research on the relationship between concern about physical disfigurement and psychological disorders in college students[14]. The internal consistency of this test was 89 percent in our research using Cronbach's alpha method[15].

The Spence Children's Anxiety Scale-Parent Version (SCAS-P): The Scale-Parent Version is a 38-item checklist, where parents rate the frequency of occurrence of anxiety symptoms on a four-point Likert-type scale, ranging from 0 (never) to three (always)[16]. Thus, higher scores indicate increased levels of anxiety. SCAS-P means norms for the total score in healthy children and young people range between 11.8 and 16, increasing to 30.1 to 33 in anxiety-disordered children and adolescents. The scale provides a total anxiety score as well as six subscale scores developed to reflect symptoms characterized by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV): panic and agoraphobia; separation anxiety; social phobia; physical injury concerns; OCD, and GAD. The proposed 6-factor structure has been supported by confirmatory factor analyses. The SCAS-P is reported to have satisfactory to excellent reliability and shows acceptable validity for anxious children. In a study conducted by Jalali et al in 2020, the questionnaire's internal consistency was assessed using Cronbach's alpha coefficient, resulting in a value of 89%[17]. The current study assessed the questionnaire's reliability using Cronbach's alpha method, yielding a score of 87 percent.

The Communication Patterns Questionnaire (CPQ): The revised family communication patterns questionnaire

(RFCPQ) includes 26 items rated on a five-point Likert scale ranging from completely disagree (score 0) to completely agree (score 4) to evaluating two sub-scales of conversation orientation (15 items) and conformity orientation (11 items)[18]. The score range in the conversation orientation and conformity orientation sub-scales is 0–60 and 0–44, respectively. A higher score in conformity orientation emphasizes harmonious opinions and attitudes, avoiding conflict, and inter-dependence among members. Conversation orientation is defined as creating a free and comfortable space for family members to participate in conversations on various topics. Children of families with higher conversation orientation scores have better mental health and academic achievement with a higher capacity for adaptability. The reliability of the questionnaire was confirmed with a Cronbach's alpha coefficient of 0.87 and 0.81 for conversation orientation and conformity orientation, respectively. Koroshnia M, Latifian reported a 92 percent similarity in internal constructs[19].The study reported that the internal structures had a similarity rate of 92 percent.

The McMaster Family Assessment Device (FAD): FAD based on the McMaster theory and by Epstein, Bishop, and Baldwin has been developed (Epstein NB, Bishop DS, Baldwin LM. McMaster Model of Family Functioning: A view of the normal family. (1982). The questionnaire had 60 items and was scored from 1 to 4 based on the Likert scale. The validity of the questionnaires was appropriately evaluated within and outside Iran. In the Iranian version of the questionnaire, Cronbach's alpha factor obtained was 0.94 for all the instruments, and the subscales were also defined as issue-solving (0.86), communications (0.87), roles (0.87), emotional responsiveness (0.81), emotional inclusion (0.89), the general family functioning (0.82)[20]. The research findings indicated that there was 82 percent similarity rate in the internal structures.

Results

All of the participants in this research are girls. The age of the students is 12 years old.

Based on the data presented in Table 1, it was discovered that the mean scores for family communication pattern, anxiety, concern about body image, and family function are 72.55, 114.15, 58.55, and 163.98 respectively.

Table 2 illustrates a significant relationship between parental performance, communication patterns, and concern about body image (r=0.924). The coefficient of determination is r=0.853, indicating that 85% of the variability in concern about body image can be explained by family functioning and parental communication patterns. Likewise, there is a strong correlation coefficient of 0.792 between parental performance, communication patterns, and students' anxiety. The coefficient of determination is r=0.628, showing that 61% of the fluctuations in anxiety can be predicted by family functioning and parental communication patterns.

The results obtained in Table 3 show that the researcher has worked efficiently to model and select predictor variables (parents' performance and communication pattern) and criteria (students' anxiety) and has selected variables as predictor variables that have a real effect on the criterion variable.

Table 4 shows that family functioning and parents' communication patterns significantly predict concern about body image in elementary schools. The family communication pattern variable has a t coefficient of -15.75, revealing the impressive impact on students' concerns about body image. Beta coefficients show a negative correlation between these variables, suggesting that improved communication patterns and family functioning lead to lower concerns about body image in students. The significance level for the family communication pattern variable is zero, while the family function is 0.002, both below the standard 0.05 threshold, confirming the findings.

The results from Table 4 reveal that family functioning and parents' communication patterns are effective predictors of anxiety in primary school students. The t coefficient for the family function variable is -6.04, demonstrating the considerable influence on students' anxiety levels. Beta coefficients also show a negative relationship between these variables, suggesting that better communication patterns and family functioning lead to lower anxiety levels in students. Both independent variables showed a significance level of zero, below the standard 0.05, confirming the findings.

Table 5 results indicate a significant relationship between family function and concern about body image (P-value<0.01). The correlation coefficient of r=-0.736 suggests that as students' concern about body image increases, family function decreases, indicating a strong negative relationship between the two variables. Similarly, the test results show a significant relationship between parents' communication patterns and concern about body image, with a correlation coefficient of r=0.860. A higher communication pattern in parents' correlates with a decrease in students' concern about body image, implying a strong negative relationship between these variables (P-value<0.01).

Table 1. Descriptive statistics of research variables

Variables	Mean	SD
The family communication patterns	72.55	28.83
Family assessment	163.98	38.60
Anxiety	114.15	39.15
Body image concern	58.55	16.88

Table 2. Correlation coefficient, coefficient of determination, and adjusted coefficient of determination of variables

Model	R	R2	Adjusted R2	Estimation of errors

1	0.924	0.853	0.849	6.55
1	0.792	0.628	0.618	24.20

Table 3. significant ANOVA test for family functioning and parents' communication patterns and concern of body image

Model	SS	df	MS	F	P-value
Regression	19206.583	2	9603.292	223.588	0.000
Remaining	3307.217	77	42.951		
Total	22513.800	79			
Regression	76001.601	2	38000.800	64.879	0.000
Remaining	45100.599	77	585.722		
Total	12110.200	79			

Table 4. Multiple regression coefficient between family functioning variable and parents' communication patterns and concern of body image

Model		Non-standard coefficients		Standard coefficients	t	P-value
		B	SD	Beta		
	(Constant)	105.613	3.222		32.779	0.000
1	**Parents' communication pattern**	-0.480	0.030	-0.820	-15.758	0.000
	Family functioning	-0.750	0.023	-0.171	-3.284	0.002
	(Constant)	236.755	11.898		19.898	0.000
1	**Parents' communication pattern**	-0.543	0.112	-0.400	-4.829	0.000
	Family functioning	-0.507	0.084	-0.500	-6.040	0.000

Table 5. Correlation coefficient of concern of body image and parents' communication pattern

Variable	Correlation coefficient	P-value
Concern of body image and family functioning	-0.736**	0.000
Concern of body image and parents' communication pattern	-0.877**	0.000
Anxiety and family functioning	-0.672**	0.000
Anxiety and communication pattern of parents	-0.751**	0.000

Discussion

This study aimed to predict the concern about body image and anxiety levels in children with nail-biting disorder in elementary schools in Tehran based on their parents' family functioning and communication patterns. The findings revealed that family functioning and parental communication patterns are significant predictors of anxiety levels in students with nail-biting disorder in primary schools, with a strong correlation between these factors. Furthermore, the beta coefficient for both independent variables was negative, indicating an inverse relationship between family communication patterns, family functioning, and student anxiety. In other words, higher levels of family communication patterns and family functioning were associated with lower levels of anxiety in students, enabling them to manage their anxiety better and create a conducive environment. The impact of family functioning on anxiety was found to be greater, confirming the initial hypothesis. These results are consistent with previous studies by Sisman et al (2017), Javed & Shazia (2020), Grada (2020), and Pawijit et al. (2017)[2,21-23].

Javed & Shazia (2020) conducted a review article on Onychophagia. It was found that nail biting is a self-regulating and persistent habit that includes repetitive actions focused on the body[2]. Individuals with this disorder may harm their appearance or cause physical damage, leading to significant physical and psychosocial issues. The quality of life is also negatively impacted. Typically, this condition is observed in both children and adults. In 2020, Grada conducted a study titled "Body image, anxiety, and concern of negative evaluation" examining the longitudinal relationship between body image dissatisfaction, social anxiety, and concern of negative evaluation in adolescents[22]. The results indicated two significant indirect paths: body image dissatisfaction leading to social anxiety through concern of negative evaluation and body image dissatisfaction leading to concern of negative evaluation through social anxiety. There were also direct effects, including a positive reciprocal relationship between body image dissatisfaction and social anxiety in the middle of adolescence, as well as a positive reciprocal relationship between social anxiety and concern of negative evaluation throughout adolescence. Moreover, there was a positive association between body image dissatisfaction and concern of negative evaluation during adolescence. These findings suggest that adolescents with lower body image dissatisfaction are more likely to experience increased concern and anxiety in social interactions. In 2017, Pawijit and colleagues conducted a study on "Dissatisfaction with body image related to social anxiety through concern of negative evaluation[23]. The aim was to investigate the role of concern of negative evaluation in the connection between body image dissatisfaction and social anxiety. Through correlation and mediation analysis, it was revealed that there were positive associations between dissatisfaction with body image, concern of negative

evaluation, and social anxiety. Furthermore, the relationship between dissatisfaction with body image and social anxiety was mediated by concern of negative evaluation.

The results of this research suggest that while many individuals who suffer from nail biting are aware of their habit, stopping it can be difficult. Nail biting tends to peak in adolescence and decline in adulthood. Multiple factors contribute to nail-biting disorder[11]. Anxiety can have a significant impact on all areas of an individual's life, presenting various obstacles. This is also true for students who are not immune to its effects. The levels of anxiety experienced by students can be influenced by factors such as family circumstances and academic pressures. How students cope with these challenges may vary depending on their age. Younger students may struggle to confront effectively, sometimes resorting to behaviors like nail biting to alleviate their anxiety. Addressing anxiety in students requires involvement from the student and their families[2].

Some families resort to using coercive and punitive methods with their children, but this is not the best approach. Research findings indicate that establishing effective communication between parents and addressing how they respond to children who bite their nails because of anxiety can help decrease anxiety levels. It is important to note that parents play a significant role in either improving or exacerbating these conditions[24]. Hence, parents' way of communicating is seen as an effective method to decrease students' anxiety, and by giving more consideration, the habit of nail-biting among students can be addressed gradually.

Another factor explored in the study is family functioning. The family's functioning was found to have a negative and significant correlation with anxiety, indicating that families can address the current situation by implementing suitable measures and handling their children who suffer from anxiety effectively. By establishing a conducive environment for their children, families can help reduce the anxiety associated with exams and nail-biting[25]**.** In this study, another factor that was examined was the concern related to body image. The concern about body image can pose risks to students. When students are compared to their peers based on factors like height, weight, and physical fitness (whether obese or thin), it can diminish their self-confidence and hinder their abilities to make decisions and solve problems[26]. The coronavirus crisis and being at home have led to inactivity and excessive use of smart devices like phones, tablets, and computers, causing students to become lazy and affecting their physical health. Students who are unhappy with their bodies may develop disorders such as nail biting[23]. To alleviate their unhappiness with their physical appearance, individuals may turn to nail biting, which is a behavior that can exacerbate different aspects of their condition. To address this issue, we can help them become mentally prepared to acknowledge reality by implementing an effective family communication strategy, engaging in conversations with the individuals, explaining the current circumstances, and gradually treating the nail-biting habit through a suitable program. This approach can help individuals find contentment with their bodies[5]. The study demonstrated that a strong correlation exists between family dynamics and body image concerns. Specifically, when families are better equipped to address and promote a positive body image among students, the students experience less concern about their bodies.

This study was encountered several limitations, one of which was the reliance on a questionnaire as the primary data collection tool. The results may have varied if alternative methods, such as interviews, had been utilized. The study focused specifically on elementary schools, therefore its findings cannot be generalized to other educational environments or populations. Some families hesitated to complete the questionnaires, which created obstacles in gathering data. Additionally, there were insufficient resources available for certain variables, which impacted the study negatively. As a result, it is advisable to conduct a separate investigation to better understand the causes of nail biting disorder. Another recommendation is to undertake a separate research project to explore the factors influencing students' anxiety related to body image. Future studies should encompass a variety of statistical populations and compare the findings with those of the current research. Furthermore, it is suggested that a dedicated study be conducted to present a comprehensive model outlining the factors affecting parent communication patterns and family dynamics.

The results indicated a connection between children's body image concern and the prevalence of nail-biting disorder among students in elementary schools. Additionally, it was found that there is a link between children's concern of body image and the communication styles of parents with children experiencing nail-biting disorder in elementary schools. The study revealed a correlation between children's anxiety levels and the family dynamics of students with nail-biting habits in primary schools. Furthermore, a connection was observed between children's anxiety and the communication patterns of parents with children suffering from nail-biting disorder in primary schools.

Ethical Considerations

The study with human participants adhered to the ethical standards outlined by the Central Tehran Branch, Islamic Azad University with the code IR.IAU.CTB.REC.1401.210. The authors thank the participants for their assistance and valuable input in the research's achievements.

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Conflict of Interest

There are no conflicts of interest.

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