A Comparative Study of Demographic Variables in Children Aged 3-9 years with Relation to Fussy Eating Behavior in Clinical and Non-Clinical Population

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Abstract: This study aimed to investigate the relationship between fussy eating behavior and demographic variables in children aged 3-9 years, both in clinical and non-clinical populations. The study involved 300 mothers who completed a self-report questionnaire about their child's fussy eating behavior, as well as demographic variables such as age, gender, number of siblings, mother's profession, and qualification. The results showed that fussy eating behavior is a common problem in both clinical and non-clinical populations. However, age, gender, mother's qualification, and profession were found to be significant predictors of fussy eating behavior. These findings have practical implications for developing effective tools and interventions to assess and manage fussy eating behavior in children, as well as understanding the factors that contribute to it.

Keywords: Fussy Eating, Children, Age, Siblings, Gender, Mother's Education, Mother's Profession

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1. Introduction

Poor health and mortality are significantly attributed to malnutrition, while fussy eating behaviors in children are one of the contributing factors to this issue Breaking Down the Microbiota–nutrition Connection, (2023). Proper nutrition is crucial for maintaining a healthy brain, as the brain requires a high level of nutrients to function properly. Changes in nutrient intake can affect brain chemistry and the functioning of nerves within the brain, leading to physical and psychological or behavioral problems Williams, (2013). Inadequate nutrient intake, particularly during the early years of life, can result in learning disabilities, anxiety, and depression Fleck, (2015).

Fussy eating behavior is a habit that some individuals develop, whereby they purposely avoid consuming a variety of foods, regardless of their familiarity (Galloway, Fiorito, Francis, and Birch, 2006). This behavior also referred to as picky eating, faddy eating, choosy eating, or selective eating, can be a short-term or long-term consistent behavior Taylor, Wernimont, Northstone, & Emmett, (2015).

Fussy eating behavior in early childhood has been associated with malnourishment, eating disorders, and emotional-behavioral

problems, whereas fussy eating that develops in late childhood is even more worrying due to its strong links with emotional-behavioral and somatic complaints Cardona Cano et al., (2015). Late-onset fussy eating is frequently due to environmental factors, such as child-parent interaction and other influences Wolstenholme et al., (2020). Moreover, as children get older, parents tend to perceive fussy eating behavior as more severe, which can have implications for the child's future lifestyle and development Dovey, Staples, Gibson, & Halford, 2008; Tharner et al., (2014).

Cardona Cano et al. (2015) suggested that boys are more likely to exhibit persistent picky eating behaviors than girls. However, another study by Moroshko and Brennan (2012) found that the prevalence of fussy eating behavior is equal in boys and girls.

Research suggests that fussy eating is more common in first-born children than in any other birth order due to three possible explanations. Firstly, older siblings can be positive role models for younger siblings, protecting them from developing fussy eating habits Wolstenholme et al., (2020). Next is, maternal concern about children's eating may decrease with subsequent children due to experience gained from raising older children (Farrow & Blissett, 2006). In addition, mothers may adapt their feeding behaviors with younger children, offering foods that are more likely to be accepted based on previous experiences with older children Cardona Cano et al., (2015).

Children may exhibit fussy eating behavior, but it usually fades as they grow older Wolstenholme et al., (2022). Fussy eating can be evolutionarily advantageous for toddlers, but it can develop into a persistent problem if not managed properly Minddisorders.com, (2015). Mothers who stigmatize their children for their eating behavior can negatively impact their relationship with food and their mothers Wolstenholme et al., (2020). Although diet does not play a significant role in preventing mental disorders, a balanced diet can reduce the intensity of symptomatology Fleck, (2015).

So this study is an attempt to find out what the relationship between fussy eating behavior and demographic variables in children aged 3-9 years, and how this differs between clinical and non-clinical populations

1.1 Significance

The study intends to define the meaning of fussy eating in this population and identify culturally relevant eating patterns that may be indicative of the risks associated with this behavior. This research is significant

in contributing scientific data on fussy eating behavior in Pakistani children and will provide insights for health professionals, including clinical psychologists, dietitians, and nutritionists. Furthermore, it is expected to inspire future researchers to explore this important issue, given the lack of research on this topic in Pakistan.

1.2 Materials and Methods

This section presents the methodology employed in the study to investigate fussy eating behavior among children in Lahore, Pakistan. The sample, research design, data collection procedures, psychometric properties of the Fussy Eating Behavior Scale, and ethical considerations are described.

1.3 Sample

The study was conducted in Lahore, Pakistan, with a sample size of 300 participants. Stratified random sampling was utilized in this study to ensure a representative and diverse sample of participants. By employing this sampling technique, the researchers aimed to minimize bias and increase the generalizability of their findings.

Stratification based on gender and clinical status allowed for an equal representation of boys and girls, as well as participants from clinical and non-clinical backgrounds, enabling the examination of potential differences in fussy eating behavior across these groups. This approach enhances the validity of the study and provides a comprehensive understanding of variables Thomas, (2022).

1.4 Research Design

Rindfleisch et al. (2008) stated in their study a cross-sectional design allowed for efficient data collection within a specific timeframe, which may be particularly beneficial when studying behaviors that can fluctuate over time, such as fussy eating. Moreover, it helps in finding relationships between variables. Therefore, a cross-sectional research design was utilized to gather data at a specific point in time. This approach allowed for the comparison of fussy eating behavior across different demographic variables. By employing a cross-sectional approach, the study aimed to collect data from a diverse sample of participants representing different age groups, genders, and clinical/non-clinical backgrounds. This design facilitated the exploration of potential associations between fussy eating behavior and demographic factors, such as age, gender, and clinical status.

1.5 Data Collection

The survey method allows for the systematic collection of self-reported data from a large number of participants efficiently and in a relatively short period (Parveen & Showkat, 2017). Thus, a survey method was employed using the Fussy Eating Behavior Scale developed by Jabeen and Bashir (2023). The scale consisted of 37 items, rated on a four-point scale ("Never", "Rarely", "Sometimes", and "Often"). It encompassed two factors: "Behavioral Responders" and "General Attitude".

1.6 Psychometric Properties

The Fussy Eating Behavior Scale demonstrated acceptable psychometric properties. The internal consistency of the scale was assessed using Cronbach's alpha, yielding a value of 0.93, indicating high reliability. The test-retest correlation coefficient was found to be 0.79, suggesting good stability over time.

1.7 Ethical Considerations

The study obtained departmental permission, and informed consent was obtained from all participants. Confidentiality and the right to withdraw from the study were assured. Oral interviews were conducted by the researcher, who read out the questions and recorded the participants' responses. The average completion time for each protocol was approximately 20 to 30 minutes.

1.8 Intervention and Explanation

Following the completion of the questionnaire, participants received an explanation of fussy eating, maternal stress, and effective ways for mothers to cope with these challenges.

2. Result

The purpose of this study was to explore the relationship between fussy eating behavior and demographic variables in children aged 3-9 years. Moreover, in this study, we aimed to examine the prevalence of fussy eating behavior in clinical and non-clinical populations. To achieve these objectives, the researcher developed and used the Fussy Eating Behavior Scale (FEBS).

During the data analysis phase, a thorough data screening process was conducted on each questionnaire to identify outliers, missing values, and coding errors. Questionnaires with substantial amounts of unanswered questions were excluded from the study. The researcher used Statistical Package for Social Sciences (SPSS) to utilize descriptive analysis to summarize and depict the data, followed by the application of t-tests, ANOVA, and regression analysis to examine and compare the connections between

variables. SPSS ensures accurate and reliable interpretation of the collected data Rahman & Muktadir, (2021). The results are given below:

A table displaying the frequency distribution of demographic characteristics of the participants is presented below.

Table I. Demographic Characteristics (Gender, Age, Class) of the Participants (N=300)

Variables	Boys *f(%)*	Girls *f(%)*	Clinical *f(%)*	Non-clinical *f(%)*	Total *f(%)*
Gender	150 (50)	150 (50)			
Boys			75 (25)	75 (25)	150 (50)
Girls			75 (25)	75 (25)	150 (50)
Age					
Early childhood (3-5)	79 (53)	87 (58)	78 (52)	88 (59)	166 (55)
Late childhood (6-9)	71 (47)	63 (42)	72 (48)	62 (41)	134 (45)

***Note. f* = Frequency, *%* = Percentage**

Table I demonstrates that the participants were divided equally into boys and girls and further distributed equally between clinical and non-clinical settings. The sample size of 300 included 79 boys and 87 girls from early childhood and 71 boys and 63 girls from late childhood. Additionally, the table indicates that a larger proportion of participants belonged to the early childhood group in both clinical and non-clinical settings.

Table II. Demographic Characteristics (Number of siblings, Mother's Qualification, Mother's profession) of the Participants (N=300)

Variables	Boys *f(%)*	Girls *f(%)*	Clinical *f(%)*	Non-clinical *f(%)*	Total *f(%)*
Mother's Profession					
Working	62 (41)	52 (35)	60 (40)	54 (36)	114 (38)
Non-Working	88 (59)	98 (65)	90 (60)	96 (64)	186 (62)
Mother's qualification					
Illiterate	18 (12)	31 (21)	25 (17)	24 (16)	49 (16)
School/College	73 (49)	80 (53)	65 (43)	88 (59)	153 (51)
University	59 (39)	39 (26)	60 (40)	38 (25)	98 (33)

***Note.* f = Frequency, % = Percentage**

Table II reveals that the sample consisted of a larger number of employed mothers (186) compared to non-working mothers (114). This aligns with the findings of a previous study by Mallan et al. (2018), which suggested that working mothers may be more attentive to their children's dietary habits and fussy eating behaviors.

Table III. Independent Sample t-test for Comparing Clinical and Non-clinical population differences on Fussy Eating Behavior Scale (FEBS) (N=300)

Factors	Population	*M*	*SD*	*T*	*p*<
General attitude	Clinical	29.02	10.24	-.31	.76 (ns)
	Non-clinical	29.35	8.52		
Behavior responders	Clinical	29.93	11.73	-.69	.49 (ns)
	Non-clinical	30.83	11.02		
Total FEBS	Clinical	59.69	20.72	-.67	.51 (ns)
	Non-clinical	61.17	17.64		

***Note. M*=Mean, *SD*=Standard Deviation, df =299, ns = not significant**

Table III presents the outcomes of the t-test analysis, which was performed on each factor of the Fussy Eating Behavior Scale (FEBS) to evaluate variations in clinical and non-clinical populations concerning each aspect of fussy eating behavior. The findings indicated that there were no statistically significant differences between clinical and non-clinical populations on any dimension of Fussy Eating Behavior (FEB).

Table IV. Independent Sample t-test for Comparing Gender differences on Fussy Eating Behavior Scale (FEBS) (N=300)

Factors	Gender	*M*	*SD*	*T*	*p*<
General Attitude	Boys	28.56	8.58	-1.15	.25 (ns)
	Girls	29.81	7.71		
Behavior Responders	Boys	29.8	11.63	-.934	.35 (ns)
	Girls	31.00	11.11		
Total FEBS	Boys	59.25	19.45	-1.06	.29 (ns)
	Girls	69.60	19.00		

***Note. M*=Mean, *SD*=Standard Deviation, df =299, ns = not significant**

Table IV displays the outcomes of the t-test conducted on each dimension of the Fussy Eating Behavior Scale (FEBS) to compare gender variations on each component of fussy eating behavior. The findings indicated no substantial differences between girls and boys in any aspect of fussy eating behavior

(FEB). However, a slight difference was observed in the mean scores, where the mean scores of girls were slightly higher in all dimensions (General Attitude, Behavioral Responders, and Total FEBS) than boys, indicating that girls are more susceptible to fussy eating behavior.

Table V Independent Sample T-test for Age and Fussy Eating Behavior in Children

Factors	Age Group	*M*	*SD*	*T*	*p*<
General Attitude	Early	29.75	9.07	1.16	.25 (ns)
	Late	28.49	9.79		
Behavior Responders	Early	30.54	11.27	.27	.78 (ns)
	Late	30.18	11.54		
Total FEBS	Early	61.23	18.58	.80	.42 (ns)
	Late	59.43	20.03		

***Note. M*= Mean, *SD*= Standard Deviation, *df*= 299, p<0.01, *ns*= not significant**

Table 5 demonstrates that there is no noteworthy difference in fussy eating behavior among children concerning their age group. However, a slight variation can be observed in the mean scores of both factors and the total of FEBS, which indicates that mothers reported children in early childhood to display fussier eating behavior than those in the late childhood group.

Table VI. One-way ANOVA for the Number of Siblings and 2 Factors and a total of Fussy Eating Behavior

Factors	No. of Siblings	*M*	*SD*	*F*	*P*
General Attitude	No siblings	32.03	9.379		
	1-2 siblings	29.34	8.441		
	3-8 siblings	28.44	10.212	1.79	.17 (ns)
	Total	29.19	9.403		
Behavior Responders	No siblings	30.00	10.967		
	1-2 siblings	30.96	11.409		
	3-8 siblings	29.89	11.474	.32	.73(ns)
	Total	30.38	11.372		
Total FEBS	No siblings	62.66	18.309		
	1-2 siblings	61.27	18.173		
	3-8 siblings	59.13	20.427	.63	.53 (ns)
	Total	60.43	19.226		

***Note. M*= Mean, *SD*= Standard Deviation, *df*= 299, p<0.01, *ns*= not significant**

The information presented in Table 6 indicates that there is no significant difference in fussy eating behavior among children with different numbers of siblings. The p-value does not reach significance as the p-value of .17 for

general attitude, 0.32 for behavior responders and .63 for total FEBS respectively is greater than .05. This indicates that there is no significant difference between the means of all groups, and the varying numbers of siblings are nearly identical.

Table VII. Independent Sample T-test for Mother's Profession and Fussy Eating Behavior

Factors	Mother's Profession	*M*	*SD*	*t*	*p*<
General Attitude towards Food	Working	30.85	8.65	2.42	.02*
	Non-working	28.17	9.72		
Behavior Responders	Working	30.51	11.28	.15	.88(ns)
	Non-working	30.30	11.46		
Total of FEBS	Working	62.39	18.27	1.39	.17 (ns)
	Non-working	59.22	19.74		

***Note. M*= Mean, *SD*= Standard Deviation, *df*= 299, *p<0.05, *ns*= not significant**

Table VII presents the results indicating a difference in the general attitude of children towards fussy eating behavior based on their mother's profession (working or non-working). The means suggest that children of non-working mothers exhibit fussier eating behavior compared to those of working mothers.

Table VIII.One way ANOVA for Mothers Qualification and 2 Factors and a total of Fussy Eating Behavior Scale

Factors	Education	*M*	*SD*	*F*	*P*
General Attitude	Uneducated	18.16	7.690	.79	.46(ns)
	School/College	19.61	8.366		
	University	18.63	8.022		
Behavior Responders	Uneducated	19.73	8.266	8.93	.000***
	School/College	22.14	6.560		
	University	24.54	6.035		
Total FEBS	Uneducated	37.90	13.942	2.70	.05*
	School/College	41.75	13.199		
	University	43.17	12.329		

***Note. M*= Mean, *SD*= Standard Deviation, *df*= 299, *p< 0.5, ***p<0.001, *ns*= not significant**

Table VIII displays a significant difference between the education level of mothers and the solution-focused approaches they use to manage their children's fussy eating behavior. As the mothers' educational level increases, their solution-focused approaches to dealing with their children's fussy eating behavior also increase. However, the level of education does not have a significant effect on the use of emotional coping strategies for handling fussy eating behavior in their children.

3. Discussion

This study aimed to investigate the prevalence of fussy eating behavior in children aged 3-9 years in both clinical and non-clinical populations, and its relationship with demographic variables including age, gender, number of siblings, mother's profession, and mother's education level. Fussy eating behavior can significantly affect a child's physical, psychological, and social well-being, yet research on this topic is limited in the cultural context of this study. Therefore, the current study contributes to highlighting the important issue, which is of great concern to caregivers, particularly mothers. It was found that fussy eating behavior is prevalent not only in the clinical population but also in the non-clinical population. This means that many children in our culture exhibit this behavior, regardless of whether they have been diagnosed with a clinical condition or not. The study's significant finding is that fussy eating behavior is prevalent in children and is a serious concern for parents, particularly mothers. Several factors may contribute to the high prevalence of fussy eating behavior, including maternal personality traits and the fact that children in the age range of 3-9 years are just beginning to express their food preferences verbally Wolstenholme et al., (2020). This may cause mothers to perceive their child's fussy eating behavior more strongly, leading even children with only a few features of fussy eating behavior to be labeled as "fussy eaters".

The study also highlighted that this issue is not confined to clinical populations but is widespread among non-clinical populations, as no significant difference in the manifestation of fussy eating behavior in children between clinical and non-clinical populations was found. Possibly the mothers who came for professional help may experience higher levels of stress Ramos-Paúl et al., (2014). As the research by Blissett, Meyer, Farrow, Bryant-Waugh, & Nicholls (2005) says mothers who believe they are unable to perform

well in any area of life, including feeding their children, are more likely to have poor mental health and poor coping skills, which may lead them to seek help from a professional.

The study found that fussy eating behavior is slightly more prevalent in girls than boys, and this could be due to several factors. Research has shown that parents tend to exert more control over their daughter's eating behavior than their son's, which can lead to pressured eating and fussy eating behavior Blissett et al., (2005). Additionally, society places a strong emphasis on slimness for girls, causing mothers to become overly concerned with their daughters' eating habits and leading to increased involvement in their food choices, which can also contribute to fussy eating behavior Wolstenholme et al., (2020). Furthermore, because girls have to undergo the energy-consuming processes of childbirth and lactation, mothers may be more conscious about their daughters' health from an early age Jansen et al., (2017).

The study found a slight difference in fussy eating behavior in children based on their age, with fussier eating behavior observed in early childhood. This is supported by previous research, which suggests that fussy eating behavior slowly fades away as children grow older Chatoor, (2002). This may be due to the evolutionary advantage of being a fussy eater in toddlers, as it reduces the likelihood of consuming unsafe food Breen, Plomin, & Wardle, (2006). However, persistent fussy eating can develop if this process is disrupted. Additionally, mothers tend to pay closer attention to the needs of their young children and may use politer and solution-focused coping strategies, as younger children may not yet have developed the cognitive abilities to understand their emotions Thorsteinsdottir et al., (2021).

The study suggests that the number of siblings a child has may have a minor effect on fussy eating behavior and coping strategies employed by mothers. This may be attributed to the higher levels of maternal stress experienced by mothers with more children Amato, (2005), leading them to rely more on emotional-focused coping strategies, which may not be as effective in addressing fussy eating behavior Mallan et al., (2018).

The study reveals that there is a correlation between a mother's level of education and fussy eating behavior in children, with more educated mothers reporting less fussy eating in their children. This could be attributed to the fact that educated mothers have a better understanding of their children's needs and may be better equipped to handle challenging situations

Kristeller & Wolever, (2010). Additionally, working mothers may use more solution-focused coping strategies than non-working mothers, possibly due to the need for quick problem-solving in a time-constrained environment Wolstenholme et al., (2020). Working mothers may also have higher life satisfaction, leading to less stress in their lives, which in turn may have a positive impact on their children's eating behavior Mallan et al., (2018). In contrast, maternal stress is positively correlated with fussy eating behavior in children. Emotional-focused coping strategies may not be as effective as solution-focused strategies in managing fussy eating behavior, and working mothers may prefer the latter due to their busy schedules Mallan et al., (2018).

4. Conclusion

In conclusion, the study suggests that fussy eating behavior is prevalent in many children in our culture, regardless of whether they have a clinical diagnosis or not. Early childhood is a crucial time for development, and it is essential to understand the factors that can impede a child's growth, including fussy eating behavior Jan, (2014). The study emphasizes the need for developing interventions and tools to help parents and caregivers assess and manage this behavior effectively. Additionally, demographic variables such as age, gender, number of siblings, mother's profession, and qualification can influence fussy eating behavior and coping strategies used by mothers. Therefore, further research is needed to gain a better understanding of these factors.

4.1 Limitations

Several limitations should be acknowledged in this study. Firstly, the sample size of 300 participants may be considered relatively small, which could limit the generalizability of the findings to the wider population of Pakistani children. Secondly, relying on self-reported data introduces the potential for recall bias or social desirability bias, which might influence the accuracy of the reported fussy eating behavior. Thirdly, the cross-sectional design used in this study restricts the establishment of causal relationships between variables. Fourthly, the study did not include fathers' perspectives, potentially overlooking valuable insights into fussy eating behavior. Moreover, cultural differences in the perception and understanding of fussy eating may impact the generalizability of the findings beyond the specific cultural context of Lahore, Pakistan. Finally, the study's findings may not be directly transferable to other countries or cultures with distinct beliefs,

practices, and attitudes surrounding fussy eating.

4.2 Practical Implications

The practical implication of this study is that fussy eating behavior is a common phenomenon among children aged 3-9 years in both clinical and non-clinical populations, and it can be influenced by several demographic variables such as age, gender, number of siblings, mother's profession, and qualification. Therefore, it is important for parents and caregivers to be aware of these factors and to assess and manage fussy eating behavior effectively. The study highlights the need for developing indigenous tools and interventions that can help in this regard. Additionally, healthcare professionals should also be aware of the prevalence of fussy eating behavior and the potential impact of demographic variables on it, so that they can provide appropriate guidance and support to parents and caregivers. Finally, the study emphasizes the need for further research to better understand the causes and consequences of fussy eating behavior and to develop effective interventions to address it.

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