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A Study on Association of Nutritional Status and Life Style Habits in Children Aged 5-12 Years Having Emotional and Behavioral Disorder Attending Rural Tertiary Health Care Centre

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ABSTRACT

Background: Emotional and behavioural disorders (EBD) in children are emerging public health challenges that can adversely affect mental, emotional, and social development. Nutritional status and lifestyle behaviours such as diet, physical activity, and sleep may influence mental health, especially in underserved populations.

Objective: To assess the association between nutritional status and lifestyle habits among children aged 5–12 years diagnosed with EBD at a rural tertiary healthcare centre.

Material and Methods: A cross-sectional study was conducted among 451 children attending the paediatric OPD at RL Jalappa Hospital from May 2023 to December 2024. Children were screened using the Child Symptom Inventory-4 (CSI-4), with 103 children identified with EBD undergoing further evaluation for nutritional and lifestyle parameters. Nutritional status was assessed using WHO growth standards, and lifestyle habits were recorded through structured interviews. Data were analysed using SPSS v22 with chi-square and Fisher's exact tests.

Results: Social anxiety (32%), generalized anxiety disorder (30.1%), and specific phobia (28.2%) were the most prevalent EBDs. Most children had normal nutritional status (70.9%) and adequate physical activity (93.2%). A significant association was found only between enuresis and undernutrition ($p = 0.008$). No significant associations were observed between other EBDs and breakfast skipping, activity levels, or sleep patterns.

Conclusion: While most EBDs were not significantly associated with nutritional or lifestyle factors, undernutrition was linked to enuresis. The findings underscore the need for targeted screening and integrated approaches to paediatric mental health, especially in rural settings.

Keywords: *Emotional and behavioural disorders, nutritional status, lifestyle habits, children, rural healthcare, enuresis, mental health.*

1. INTRODUCTION

Mental health is important for overall well-being, affecting cognitive, emotional, and social functioning. The World Health Organization defines mental health as a state where individuals can cope with life stress, work productively, and contribute to their community [(1)]. Childhood mental well-being is essential for healthy development and future stability. Emotional and behavioral disorders (EBD) in children are significant public health concerns, leading to functional impairment, academic underachievement, and poor social relationships. Untreated EBD can result in long-term outcomes like substance abuse, criminal behavior, and mental illness in adulthood [(2)]. Nutrition and lifestyle factors are essential determinants of child health and development. EBD is prevalent among children worldwide, with 10-20% suffering from mental health conditions. Psychiatric disorders affect 12-20% of the population in India, with higher rates observed in marginalized and underserved communities [(3)]. An increasing number of studies have investigated the link between nutritional status , lifestyle behaviours,

and mental health outcomes. Studies have consistently highlighted the role of dietary quality, and sleep patterns in influencing emotional and behavioural health. Although certain research findings highlight a direct connection between malnutrition and EBD, others indicate that lifestyle elements might play a mediating role [4].

researchers examined various lifestyle screening tools designed to identify at-risk children. "The review concluded that comprehensive tools assessing dietary intake, physical activity, and sedentary behaviour are essential for early identification of children susceptible to mental health issues". However, the study emphasized the need for improved follow-up strategies to ensure effective interventions [5]. Family dynamics, including parental mental health, parenting style, family cohesion, and household stability, significantly influence children's psychological well-being and nutritional status. Children raised in dysfunctional or fragmented environments with conflict, inconsistent discipline, neglect, or poor communication are at a higher risk for emotional disturbances and poor eating behaviors. Parental involvement, emotional support, and consistent routines are protective factors, while household stress and negative childhood events are linked to undernutrition and behavioral disorders [6]. The multifactorial nature of EBD underscores the importance of holistic assessment strategies. The role of family structure, parental education, and socioeconomic factors has also been extensively studied. Children from families with unstable home environments, limited parental involvement, or inconsistent routines are at higher risk of developing EBD. These findings underscore the multifactorial nature of EBD and the importance of holistic assessment strategies [7].

Objectives of the study:

1) To screen all stable children between 5-12years for emotional and behavioural disorders who are coming to paediatric OPD
2) All children who fail the emotional and behavioural screening will be evaluated for nutritional status and lifestyle habits
3) To establish the association of nutritional status and lifestyle habits on children with emotional and behavioural disorders

2. MATERIAL AND METHODS

A cross sectional study was conducted in paediatric Out Patient Department at R L JALAPPA hospital from May 2023 to December 2024. The sample size was estimated by using the proportion of prosocial behaviour in school children was 18.3% from the study by Shinsugi C et al. Using the formula $Z1\text{-}\alpha/2^{2}$ P (1-P) / d2. Where Z1-α /2 = is standard normal variate (at 5% type 1 error (P<0.05) it is 1.96 and at 1% type1 error(P<0.01) it is 2.58). As in the majority of studies, P values are considered significant below 0.05 hence 1.96 is used in formula. P= Expected proportion in population based on previous studies or pilot studies, d= Absolute error or precision, P = 18.3% or 0.183, q = 81.7% or 0.817, d = 7.5% or 0.075. Using the above values at 95% confidence level, a sample size of 103 children was included in the study."

Around 451 stable children age group of 5 to12 years visiting the paediatrics OPD at RL Jalappa hospital within the study period and who had consented to be a part of the study was included in this study. Child with any chronic organic illness, known case of neuro psychological disorder and child who is sick needs admission were excluded from the study.

This study was started after obtaining consent from the parents. All children fulfilling the inclusion criteria was included in the study. "All the parents or guardians of each children of age 5-12 years were given the Child Symptom Inventory (CSI)-44 or the investigator himself/herself ask the parents in their own local language": "CSI-4 is a behaviour rating scale that is referenced by DSM-IV-R for emotional and behavioural disorders between 5 and 12 years old. There is a parent version (97 items). The "CSI-4 Parent-Checklist" contains screens for 15 emotional and behavioural disorders. CSI-4 can be scored to derive symptom count scores or symptom severity scores. In this study, the parents of the children were interviewed by CSI-4 Parent-Checklist and each parent rates each item on a 4-point response scale, indicating how frequently the symptoms are observed. CSI-4 contains symptom-categories for DSM-IV disorders: such as ADHD of Inattentive type, ADHD of Hyperactive- Impulsive type, ADHD of Combined type; Oppositional defiant disorder (ODD), Conduct disorder(CD), Generalised anxiety disorder(GAD), social phobia, Separation anxiety disorder(SAD), dysthymic disorder; schizophrenia and autistic disorder."

"The CSI-4 also contains single items to screen for simple phobias, obsessions, compulsions, motor tics, vocal tics, enuresis, and encopresis. Administration time is between 10 and 15 min." There are two scoring procedures: "Symptom Count (categorical) scores, which use scores of 0 (never/sometimes) or 1 (often/ very often), and Symptom Severity (dimensional) scores, which use scores of 0 (never), 1 (sometimes), 2 (often), or 3 (very often)." "Symptom Severity scores are simply the sum of the item scores for a particular symptom category. For symptom count scores, a specific symptom is generally considered to be a clinically relevant problem if it is rated as occurring "often" or "very often." When the symptom count score is equal to or greater than the number of symptoms specified by DSM-IV as being necessary for a diagnosis, the child receives a Screening Cutoff score of "yes" for the disorder. Although CSI- 4 contains the behavioural symptoms of disorders, it does not include additional diagnostic criteria (e.g., age of onset of symptoms, impairment of functioning." [33]

"The World Health Organization (WHO) uses weight, height, and BMI for classifying a patient's nutritional status. These measurements are then plotted on WHO growth charts according to age and gender to determine the appropriate percentile or Z-score for height for age (H/A), weight for age (W/A), weight for height (W/H), BMI for age (BMI/A), The Z-score determines if the child is stunted, underweight, overweight or wasted. Children's height was measured by using height measuring tape with the child standing barefoot. Weight was measured by using a digital scale with the child wearing light clothing. Body mass index was calculated as weight divided by the square of height. The body mass index-for-age z-score (BAZ) was determined using the WHO growth standards. Thinness was defined as BAZ < −2. Overweight and obesity was classified as BAZ > 1[33].

Breakfast skipping, physical activity, wake-up time, and bedtime was considered as lifestyle habits [35]. Breakfast skipping was assessed according to whether the child usually consumes breakfast in accordance with the Food-Based Dietary Guidelines for Indian children aged 5–10 years. The frequency and duration of participants' physical activity during a typical week was reported by their guardians. Three types of physical activity (vigorous-, moderate-, and light-intensity activities), with reference to the Global Physical Activity Questionnaire and the Global School-based Student Health Survey was considered. The WHO recommends that children and youth aged 5–17 years engage in at least 60 min of moderate- to vigorous-intensity physical activity (MVPA) daily; therefore, total amount of MVPA was calculated. The children's parents/guardians were asked about their children' wake-up time and bedtime on a normal day. Three categories of wake-up times, <6:00 am, 6:00 am to 6:29 am, and 6:30am to 8:29am was established. The bed time was categorised as 7:00 pm to 8;59PM, 9:00 PM to 9:59pm and 10pm to 11:59pm. Early wake up time was defined as waking up before 6am and late bedtime as going to bed after 10pm."

In this study the included children who are recognised to have the above mentioned behavioural disorders was discovered. Nutritional status and lifestyle habits of these discovered children was evaluated and their association with the behavioural and emotional disorders was studied. Data was entered into Microsoft excel data sheet and analysed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Chi-square and fishers exact test was used as a test of significance. Continuous data was represented as mean and standard deviation. All tests were conducted with a two-tailed approach, and statistical significance was determined at a 95% confidence level, considering results significant if the p-value was <0.05." Ethical principles including patient respect, beneficence, and justice were strictly followed. Approval from the ethical committee was obtained prior to commencing the study.

3. RESULTS

Figure 1 shows emotion and behavioral disorders among children with 5 to 12 years of age. Among 451 children's, 103 had Emotional and behavioral disorders.

Figure 1: Pie diagram shows distribution of emotional and behavioral disorders

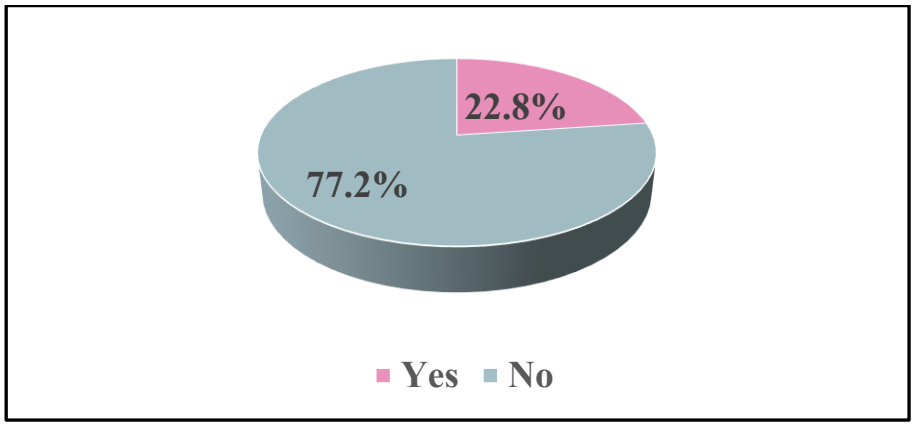

Table 1: Basic Characteristics among study population

Basic Characteristics	Number	Percentage
Gender		
Male	57	55.3 %
Female	46	44.7 %
Median (Inter Quartile Range)		

Mean Height ± Std. Deviation	131.54 ± 16.73	
Mean Weight ± Std. Deviation	28.69 ± 12.07	
Nutritional status (BMI)		
Under weight	7	6.8 %
Normal	73	70.9 %
Overweigh	13	12.6 %
Obese	10	9.7%
Emotional/Behavioural Disorders		
Attention-Deficit/Hyperactivity Disorder (ADHD)	8	7.8%
Autism	5	4.9%
Conduct Disorder	8	7.8%
Oppositional Defiant Disorder (ODD)	7	6.8%
Generalized Anxiety Disorder (GAD)	31	30.1%
Separation anxiety disorder (SAD)	4	3.9%
Social anxiety	33	32.0%
Specific Phobia	29	28.2%
Obsessive-Compulsive Disorder (OCD)	6	5.8%
Post-Traumatic Stress Disorder	0	0%
Somatoform Disorder	0	0%
TIC	3	2.9%
Enuresis	6	5.8%
Lifestyle Habits		
Breakfast Skipping	11	10.7%
Moderate- to Vigorous-intensity Physical Activity (MVPA)		
<60 Minutes	7	6.8 %
>60 Minutes	96	93.2 %
Total	**103**	**100.0 %**

Out of 103 patients, 57 (55.3%) were males and 46 (44.7%) were females. The median age of the study participant was 9 (IQR = 7.0– 11.0) years, the mean height distribution among study participant was 131.54 ± 16.73 cms. The minimum height observed was 98.5 cms and the maximum height observed was 170.0 cms. The mean height distribution among study participant was 28.69 ± 12.07 kgs. The minimum weight observed was 11.2 kgs and the maximum weight observed was 65.6 kgs. Among 103 cases, 7 (6.8 %) children's were underweight, 73 (70.9%) children's were normal, 13 (12.6%) children's were overweight and 10 (9.7%) children's were obese. The mean BMI distribution among the children was 16.15 ± 3.29 kg/m^2. Regarding Emotional/Behavioural Disorders among 103 children's, majority 33 (32.0%) of them had Social anxiety followed by 31 (30.1%) had generalized anxiety disorder, 29 (28.2%) children's had specific phobia, 8 (7.8%) children's had ADHD, 8 (7.8%) children's had conduct disorder, 7 (6.8%) children's had ODD, 6 (5.8%) children's had OCD, 6 (5.8%) children's had Enuresis, 5 (4.9%) had Autism and 4 (3.9%) had SAD, 3 (2.9%). Among 103 children's, 11(10.7%) children's had a habit of skipping breakfast. Out of 103 children's, around 7 (6.8%) children's do less than 60 minutes MVPA and 96 (93.2%) children's do more than 60 minutes MVPA

Table 2: Association between emotional and behavioral disorders, Lifestyle Habits and Disorders children with nutritional status

	Underweight	Normal	Overweight	Obese	p value
Attention-Deficit/Hyperactivity Disorder (ADHD)	0	6 (8.2%)	1 (7.7%)	1 (10.0%)	0.878
Autism	1 (14.3%)	2 (2.7%)	2 (15.4%)	0	0.128
Conduct Disorder	0	6 (8.2%)	2 (15.4%)	0	0.474
Oppositional Defiant Disorder (ODD)	0	6 (8.2%)	1 (7.7%)	0	0.685
Generalized Anxiety Disorder (GAD)	2 (28.6%)	21 (28.8%)	4 (30.8%)	4 (40.0%)	0.910
Separation anxiety disorder (SAD)	0	3 (4.1%)	1 (7.7%)	0	0.752
Social anxiety	2 (28.6%)	25 (34.2%)	4 (30.8%)	2 (20.0%)	0.831
Specific Phobia	2 (28.6%)	21 (28.8%)	1 (7.7%)	5 (50.0%)	0.167
Obsessive-Compulsive Disorder (OCD)	0	4 (5.5%)	2 (15.4%)	0	0.357
Post-Traumatic Stress Disorder	0	0	0	0	
Somatoform Disorder	0	0	0	0	
TIC	0	3 (4.1%)	0	0	0.736
Enuresis	2 (28.6%)	1 (1.4%)	2 (15.4%)	1 (10.0%)	0.008
Breakfast skipping					
Yes	1 (14.3%)	8 (11.0%)	0	2 (20.0%)	0.463
No	6 (85.7%)	65 (89.0%)	13 (100%)	8 (80.0)	
MVPA					
<60 minutes	1 (14.3%)	4 (5.5%)	1 (7.7%)	1 (10.0%)	0.802
>60 minutes	6 (85.7%)	69 (94.5%)	12 (92.3%)	9 (90.0%)	
Total	**7 (100%)**	**73 (100%)**	**13 (100%)**	**10 (100%)**	

For Attention-Deficit/Hyperactivity Disorder, 6 (8.2%) were of normal weight, with one child each being overweight (7.7%) and obese (10.0%), and with no instances being underweight. The p-value (0.878) indicates there is no strong association with nutritional status. Of children with Autism, one (14.3%) was underweight, 2 (2.7%) were normal weight, another 2 (15.4%) were overweight, with none being obese, resulting in a p-value of 0.128, which indicates no strong correlation. For Conduct Disorder, six children (8.2%) were in the normal weight group, two (15.4%) were overweight, and there were no cases in the underweight or obese groups ($p = 0.474$). For Oppositional Defiant Disorder (ODD), six children (8.2%) were of normal weight, one (7.7%) was overweight, and none were underweight or obese ($p = 0.685$), which shows no statistically significant correlation. In Generalized Anxiety Disorder (GAD), 2 (28.6%) children were underweight, 21 (28.8%) were of normal weight, four (30.8%) were overweight, and four (40.0%) were obese. The p-value (0.910) indicates no significant difference between nutritional groups. Separation Anxiety Disorder (SAD) was found in three normal-weight children (4.1%) and one overweight child (7.7%), but none among underweight or obese children ($p = 0.752$). Social Anxiety Disorder was found in two underweight children (28.6%), 25 normal-weight children (34.2%), four overweight children (30.8%), and two obese children (20.0%), with p-value of 0.831, indicating no significant relation. For Specific Phobia, two underweight children (28.6%), 21 normal-weight children (28.8%), one overweight child (7.7%), and five obese children (50.0%) were

impacted, although the p-value (0.167) indicates a non-significant trend. Obsessive-Compulsive Disorder (OCD) was present in four normal-weight children (5.5%) and two overweight children (15.4%), but not in the underweight or obese children (p = 0.357).

"There were no cases of Somatoform Disorder or Post-Traumatic Stress Disorder in any of the nutritional groups." Tic Disorder occurred in three normal-weight children (4.1%) but not in the other groups (p = 0.736). Enuresis (bedwetting) occurred in two underweight children (28.6%), one normal-weight child (1.4%), two overweight children (15.4%), and one obese child (10.0%). The p-value (0.008) is statistically significant and shows that enuresis is associated with nutritional status. Overall, seven children (100%) were underweight, 73 (100%) were normal weight, 13 (100%) were overweight, and 10 (100%) were obese. Most of the emotional and behavioral disorders were not statistically significantly associated with nutritional status, but one disorder, enuresis, had a significant association (p = 0.008), indicating that weight status can affect the prevalence of bedwetting in children.

Among children's those skipping breakfast, one underweight child (14.3%), eight normal-weight children (11.0%), and two obese children (20.0%) skipped breakfast, whereas none of the overweight children skipped meals. Most children from all groups never skipped breakfast and included six underweight children (85.7%), 65 normal-weight children (89.0%), 13 overweight children (100%), and eight obese children (80.0%). "The p-value (0.463) implies no statistically significant relationship between nutritional status and breakfast skipping. In the case of moderate-to-vigorous physical activity (MVPA), there was one underweight child (14.3%), four normal-weight children (5.5%), one overweight child (7.7%), and one obese child (10.0%) who had less than 60 minutes of daily physical activity." In contrast, the majority of children had greater than 60 minutes of daily MVPA, which included six underweight children (85.7%), 69 normal-weight children (94.5%), 12 overweight children (92.3%), and nine obese children (90.0%). p-value (0.802) confirms no significant relationship between nutritional status and MVPA levels.

Table 3: "Association between emotional and behavioral disorders children with Breakfast Skipping Habits"

Emotional and behavioral disorders	Breakfast Skipping		p value
	Yes	No	
ADHD	2 (18.2%)	6 (6.5%)	0.172
Autism	1 (9.1%)	4 (4.3%)	0.489
Conduct Disorder	0	8 (8.7%)	0.309
Oppositional Defiant Disorder (ODD)	1 (9.1%)	6 (6.5%)	0.749
Generalized Anxiety Disorder (GAD)	3 (27.3%)	28 (30.4%)	0.829
Separation anxiety disorder (SAD)	0	4 (4.3%)	0.481
Social anxiety	1 (1.9%)	32 (34.8%)	0.084
Specific Phobia	4 (36.4%)	25 (27.2%)	0.522
Obsessive-Compulsive Disorder (OCD)	1 (1.9%)	5 (5.4%)	0.625
TIC	0	3 (3.3%)	0.543
Enuresis	0	6 (6.5%)	0.383
Total	**11 (100%)**	**92 (100%)**	

Among children with ADHD, two (18.2%) skipped breakfast, whereas six (6.5%) did not, with a p-value of 0.172, showing no relationship. Likewise, for Autism, one child (9.1%) who skipped breakfast had the condition, whereas four (4.3%) of the non-skipping children did (p = 0.489). Conduct Disorder was diagnosed in eight children (8.7%) not skipping breakfast but none in the skipping group (p = 0.309). For Oppositional Defiant Disorder (ODD), a single child (9.1%) in the skipping group and six children (6.5%) in the non-skipping group were afflicted, with no difference (p = 0.749). Generalized Anxiety Disorder (GAD) was seen in three children (27.3%) who missed breakfast and 28 (30.4%) who did not, with a p-value of 0.829, indicating no significant difference. Separation Anxiety Disorder (SAD) was present in four children (4.3%) who didn't skip breakfast only, while no instances were found in the skipping group (p = 0.481). Social Anxiety Disorder was diagnosed in one child (1.9%) skipping breakfast and in 32 children (34.8%) not skipping breakfast, with a p-value of 0.084, indicating a trend but not significance. For Specific Phobia, four (36.4%) children who skipped breakfast were diagnosed with the disorder, while 25 (27.2%) were not (p = 0.522). One child (1.9%) with OCD was in the breakfast-skipping group,

and five children (5.4%) were in the non-skipping group (p = 0.625). For Tic Disorder (TIC), there were 3 children (3.3%) in the non-skipping group but none in the group that skipped breakfast (p = 0.543). Finally, Enuresis (bedwetting) was noted in six children (6.5%) who did not skip breakfast, but none among the skipping group (p = 0.383). Analysis indicates that no emotional or behavioral disorder demonstrated a statistically significant relationship with skipping breakfast.

Table 4: "Association between emotional and behavioral disorders children with moderate- to vigorous-intensity physical activity (MVPA)"

Emotional and behavioral disorders	MVPA		p value
	< 60 minutes	> 60 minutes	
ADHD	2 (28.6%)	6 (6.3%)	0.033
Autism	0	5 (5.2%)	1.000
Conduct Disorder	2 (28.6%)	6 (6.3%)	0.033
Oppositional Defiant Disorder (ODD)	0	7 (7.3%)	1.000
Generalized Anxiety Disorder (GAD)	1 (14.3%)	30 (31.3%)	0.345
Separation anxiety disorder (SAD)	0	4 (4.2%)	1.000
Social anxiety	4 (57.1%)	29 (30.2%)	0.207
Specific Phobia	2 (28.6%)	27 (28.1%)	0.980
Obsessive-Compulsive Disorder (OCD)	0	6 (6.3%)	1.000
TIC	0	3 (3.1%)	-
Enuresis	1 (14.3%)	5 (5.2%)	0.322
Total	7 (100%)	96 (100%)	

Among the children with ADHD, 2 out of 7 (28.6%) were in the <60 minutes MVPA group and 6 out of 96 (6.3%) were in the >60 minutes' group, indicating a statistically significant association (p = 0.033). Likewise, for Conduct Disorder, 2 children (28.6%) belonged to the <60 minutes' group, while 6 children (6.3%) belonged to the >60 minutes' group, with a large p-value of 0.033. Autism was seen in only those who had >60 minutes of MVPA (5 children, 5.2%), with no instances in the <60 minutes' group, but this was not statistically significant (p = 1.000). Oppositional Defiant Disorder (ODD) was diagnosed in 7 children (7.3%) in the >60 minutes' group but none in the <60 minutes' group, p-value = 1.000. Generalized Anxiety Disorder (GAD) was higher among the >60 minutes MVPA group with 30 cases (31.3%) than with 1 case (14.3%) for the <60 minutes' group (p = 0.345). "Separation Anxiety Disorder (SAD) and Obsessive-Compulsive Disorder (OCD) occurred only in the >60 minutes' group in 4 (4.2%) and 6 (6.3%) children respectively, and not in the <60 minutes' group, both having p-values of 1.000. Social anxiety was noted in 4 children (57.1%) with <60 minutes of MVPA, and in 29 children (30.2%) with >60 minutes of MVPA (p = 0.207).The proportion of Specific Phobia was almost equal between the two groups, with 2 children (28.6%) in the <60 minutes' group and 27 children (28.1%) in the >60 minutes' group (p = 0.980). The sole presence of both Tic disorder and Enuresis was in the >60 minutes MVPA category, with 3 cases (3.1%) and 5 cases (5.2%) respectively, with the only exception being in the <60 minutes' category one case (14.3%) of Enuresis, but these were non-significant (Tic disorder had no given p-value; Enuresis p = 0.322). In total, 7 children (100%) were in the <60 minutes MVPA group and 96 children (100%) in the >60 minutes MVPA group.

4. DISCUSSION

The present study showing that 103 out of 451 children (22.8%) had emotional and behavioural disorders (EBDs), further strengthens the assertion that mental health conditions in children are a significant concern even in rural populations. This prevalence aligns closely with global estimates of childhood mental health disorders, which range between 10–20%, and is comparable to Indian studies like that of Malhotra and Patra [6], who reported prevalence rates around 12–13%. However, our observed prevalence is slightly higher, possibly due to active screening using a standardized instrument (CSI-4) in a clinical setting, which may have allowed for the identification of subclinical or undiagnosed cases. Moreover, this 22.8% prevalence exceeds the rates found in some community-based studies and aligns more with findings from tertiary care or urban mental health surveys, reflecting how **access to care and use of validated screening tools** can significantly influence diagnostic yield. "For instance, the National Mental Health Survey of India (2015–16) [10] reported increased rates of anxiety and conduct disorders when structured diagnostic tools were employed. This finding reiterates the **importance of routine mental health screening** in paediatric OPDs, especially in rural areas where behavioural disorders often go unrecognized."

Findings suggest a high prevalence of emotional and behavioural conditions such as social anxiety (32.0%), generalized anxiety disorder (30.1%), and specific phobia (28.2%), Only limited statistically significant links were found between these disorders and nutritional status or lifestyle habits, with the exception of enuresis, which showed a significant relationship

with nutritional status (p = 0.008). The mean age of the participants was 8.84 years, with a balanced representation across age categories. A slight male predominance was observed (55.3%), which aligns with epidemiological data suggesting a higher prevalence of behavioural disorders in boys than girls." Studies such as Merikangas et al[10]. and Ghandour et al[11]. have consistently reported higher rates of externalizing disorders like ADHD and conduct disorders among boys, possibly due to gender-based neurodevelopmental and sociocultural influences.

Social anxiety (32.0%), generalized anxiety disorder (30.1%), and specific phobia (28.2%) were the most commonly reported emotional disorders. These results parallel findings from "**Costello et al. [12] (2003)** and **Polanczyk et al.[5]**, who identified anxiety disorders as the most prevalent group of mental health problems in children. The relatively high incidence of social anxiety and specific phobias may be influenced by environmental stressors, including academic pressure, family dynamics, and rural socio-cultural factors. The **National Mental Health Survey of India (2015-16) [13]** highlighted a significant burden of anxiety and phobic disorders among children in both urban and rural areas, emphasizing the need for early detection and community-based mental health services. Less common were ADHD (7.8%), conduct disorder (7.8%), and oppositional defiant disorder (6.8%), consistent with studies conducted at bangalore**[14].** In South India, which found disruptive behaviour disorders to occur in under 10% of school-going children. In terms of nutritional assessment, the mean height and weight were 131.5 cm and 28.7 kg, respectively. The BMI distribution showed that 70.9% of children were within the normal range, with 6.8% underweight, 12.6% overweight, and 9.7% obese. These proportions are in line with findings from Kaur et al [17]. in Punjab, which showed a similar pattern of normal weight predominance among rural children, albeit with growing concerns of childhood overweight and obesity in some pockets due to changing dietary habits.

In the present study showed a significant correlation with underweight and overweight status. This aligns with a retrospective analysis by Tsai et al [19] (2020), which found that both undernutrition and obesity could influence bladder control due to delayed physical development and disrupted sleep cycles. The strong association between enuresis and malnutrition in our study may reflect underlying psychosocial stressors or physiological immaturity, often seen in undernourished children. Conversely, no significant associations were found between nutritional status and disorders such as ADHD, conduct disorder, and anxiety, supporting findings by Hitomi et al [20] and Sciberras et al [21], who reported that while dietary patterns may influence mood and cognition, direct causality with ADHD or ODD is inconsistent.

The most common disorders in our cohort were social anxiety (32.0%), generalized anxiety disorder (30.1%), and specific phobia (28.2%). This trend is consistent with studies by Costello et al.[12] and Merikangas et al [10], who documented anxiety-related disorders as the most prevalent category of mental health conditions in school-aged children. The slightly higher prevalence observed in our population might be explained by the rural socio-environmental stressors, parental neglect, and poor access to mental health education. ADHD was seen in 7.8% of children, comparable to global estimates (5–7%) reported by the CDC[50](2019) and Polanczyk et al [5]. Conduct disorder and oppositional defiant disorder also showed similar prevalence patterns, reinforcing the universality of these behavioural issues across diverse populations.

Most emotional and behavioural disorders did not show statistically significant associations with nutritional status, except for **enuresis**, which was significantly linked to underweight status (p = 0.008). This is consistent with findings from **von Gontard et al [23].** and **Joinson et al[24]**, who emphasized the multifactorial origin of enuresis, including physiological immaturity, stress, and undernutrition. The relationship between low BMI and enuresis could be related to delayed maturation of the central nervous system or bladder control mechanisms, as supported by **Shreeram et al[25].** Undernourished children may also have altered sleep architecture, contributing to nocturnal enuresis. No significant associations were found between nutritional status and disorders such as ADHD, conduct disorder, autism, or anxiety-related disorders. This is consistent with **Caylak[26]**, who found inconsistent links between ADHD and nutritional deficits in children, suggesting that nutrition alone does not account for neurodevelopmental disorders. Similarly, **Adrienne et al[27]** emphasized the role of diet quality over BMI in determining behavioural outcomes, especially in anxiety and depressive disorders. Interestingly, "while some studies such as **Wiles et al [28].** and **Khalid et al[29]** proposed links between obesity and emotional distress, particularly depression and anxiety, our study did not observe statistically significant correlations. This may be due to the relatively small number of obese children in our sample (n=10), possibly limiting the power of subgroup analysis."

The majority (93.2%) of children reported engaging in more than 60 minutes of MVPA daily, consistent with the WHO recommendation. No significant association was found between MVPA and emotional/behavioral disorders or BMI. Similar null findings were reported in **Niederer et al[30]**, who observed that although physical activity improves well-being, its direct effect on psychiatric symptomatology is modest. However, a small subset of children with low physical activity (<60 min/day) did exhibit disorders such as anxiety and specific phobia, suggesting the need for further exploration. Literature from **Biddle and Asarec[31]** and **Lubans et al [32]** suggests that regular physical activity can reduce anxiety and depressive symptoms through neurochemical modulation (e.g., endorphins, serotonin), indicating that sustained interventions might be more effective than observational cross-sectional assessments. Only 10.7% of children reported skipping breakfast, and there was no significant association between breakfast habits and either nutritional status or emotional/behavioural disorders. Several studies, such as "**Rampersaud et al [33]** and **Adolphus et al [34]**, have highlighted the benefits of breakfast on cognitive and behavioural outcomes." However, the lack of significant association in our study may be due to the small number of breakfast skippers or compensatory dietary intake later in the day. No significant associations were found between these

lifestyle habits and EBDs. "This contrasts with the findings of Satomi et al [34], who reported a higher prevalence of mood and behavioural symptoms in breakfast-skipping children". Similarly, Nina et al [35] observed that inadequate physical activity was linked to increased irritability and inattention. Interestingly, a non-significant trend was observed in the association between breakfast skipping and specific phobia and ADHD, echoing findings from Smith et al [37] and Mahoney et al [38], who suggested that irregular meal patterns may affect attention and emotional regulation through glycemic fluctuations. Among all comparisons, the most significant finding was the association between enuresis and undernutrition. This relationship was found to be statistically significant ($p = 0.008$), affirming results from Neveus et al [39] and Cuneyt et al [40], who also observed a link between lower BMI and higher prevalence of nocturnal enuresis in children. The underlying mechanisms proposed include poor muscular development, altered hormonal rhythms (e.g., ADH secretion), and psychosocial stress—factors potentially more pronounced in malnourished children. This finding underlines the importance of integrating nutritional assessments into behavioural health evaluations, especially in rural paediatric populations. The present study provides key insights into the association between physical activity levels and specific emotional and behavioural disorders. A statistically significant association was observed between low MVPA (<60 minutes/day) and both ADHD and Conduct Disorder ($p = 0.033$ for both). This supports existing literature, which has highlighted the protective effects of regular physical activity on externalizing disorders, particularly ADHD. Smith et al [37] and Lubans et al [32] have reported that structured physical activity programs result in significant improvements in executive function, self-regulation, and behavioural control among children with ADHD and disruptive behaviour disorders. The neurobiological mechanisms behind these effects are attributed to improved dopamine regulation, increased endorphin release, and better sleep quality, all of which influence emotional regulation and attentional processes."

In contrast, "internalizing disorders like generalized anxiety disorder, social anxiety, and specific phobia did not show statistically significant associations with MVPA in this study, though some trends (e.g., social anxiety more frequent in the low activity group) were observed." This finding is consistent with studies such as Biddle and Asare[31] (2011), who noted that while physical activity tends to benefit mood and anxiety symptoms, the impact may be modest unless combined with other lifestyle or therapeutic interventions. Importantly, these results suggest that physical inactivity may play a more prominent role in the development or exacerbation of externalizing symptoms (like aggression and hyperactivity) rather than internalizing symptoms. This distinction is crucial in tailoring interventions: children with ADHD or conduct disorders might benefit significantly from structured physical activity programs, while those with anxiety disorders may require more comprehensive psychosocial interventions alongside lifestyle modifications. Furthermore, while most children (93.2%) in the study engaged in adequate MVPA (>60 minutes/day), the subgroup of inactive children exhibited disproportionately higher rates of ADHD and conduct disorder, emphasizing the need to monitor and promote daily physical activity, particularly in high-risk groups. However, "the study has limitations, including a cross-sectional design, a small sample size, potential reporting bias, lack of control for confounding factors, geographical limitations, and a limited dietary assessment. The cross-sectional design limits the generalizability of the findings, while the small sample size may introduce recall or social desirability bias. Additionally, the study may not be generalizable to populations with different cultural or dietary backgrounds." The study may also not account for regional health patterns and may not be generalizable to populations with different cultural or dietary backgrounds.

5. CONCLUSION

This study aimed to explore the distribution of emotional and behavioural disorders among children aged 5 to 12 years and their association with nutritional status and lifestyle habits. The findings indicate that social anxiety (32.0%), generalized anxiety disorder (30.1%), and specific phobia (28.2%) were the most commonly observed emotional/behavioural disorders in the study population. While most disorders did not show a statistically significant association with nutritional status or lifestyle habits such as breakfast skipping or physical activity levels, enuresis was significantly associated with nutritional status ($p = 0.008$), suggesting that undernutrition may play a role in its occurrence. The majority of children had a normal nutritional status (70.9%), and a large proportion engaged in adequate physical activity (93.2%) and reported regular breakfast consumption (89.3%). These results underline the importance of a balanced nutritional and lifestyle pattern in children but also highlight that emotional and behavioural health issues can occur regardless of these factors. Regular mental health screenings and nutritional support are crucial for early identification and treatment of EBD in children. Enuresis is linked to nutritional status, so monitoring children's growth and BMI is essential. Parents should be educated about common behavioral disorders and the importance of balanced nutrition and routines. A multidisciplinary approach involving pediatricians, psychologists, nutritionists, and educators is essential for comprehensive assessment and management. Further research is needed to understand the complex interplay between nutrition, lifestyle, and psychological well-being in children.

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