

Food Safety and Food Security Challenges among ADHD Children in Covid 19 Pandemic

S.Soundariya and C.A. Kalpana*

Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India-43

*Corresponding E-mail: kalpana_fsn@avinuty.ac.in

Abstract

Attention Deficit and Hyperactivity (ADHD) is a typical neurodevelopmental disorder in children with low levels of copper, iron, zinc, magnesium, and omega-3 fatty acids have been detected in children with ADHD. In contrast, sugar, artificial food colourings, and preservatives have been associated with an increased risk of ADHD. During the COVID-19 pandemic, managing food and nutrition for children with ADHD presented several difficulties. This study was conducted to evaluate the eating patterns of ADHD children, restricted foods (food safety), and the significance/need for parents and caregivers of ADHD children to be aware of food safety and security. The children were between 4 and 12 years old; 64% of the respondents were boys, while 36% were girls. They eat more Indian cuisine and have at least one Indian meal daily, whereas they occasionally enjoy western foods. Children who consume western cuisine are more prone to ADHD than those who consume Indian cuisine. Most parents are aware of the foods children with ADHD should avoid. Regarding ADHD, there is a considerable correlation between children's dietary patterns and food safety. During the pandemic, many parents of children with attention deficit hyperactivity disorder were primarily concerned with ensuring their children received adequate nutrition and coping with an unanticipated financial crisis.

Keywords: ADHD, Dietary Pattern, Nutrition, Covid-19, Food Safety, Food Availability.

1. Introduction:

Attention Deficit and Hyperactivity (ADHD) is a common neurodevelopmental disorder among children. This ADHD is associated with symptoms such as "inattention", "hyperactivity", cognitive dysfunctions such as working memory and inhibitory control, and well-documented pathophysiology in the brain [1]. Attention Deficit Hyperactivity Disorder (ADHD) is caused by a complex interaction between pathophysiological, neurochemical, and genetic phenotypic systems. Everyone concurs that psychological, environmental, and nutritional factors, as well as psychosocial, environmental, and nutritional factors, can induce or maintain ADHD symptoms. [2]. People think that the symptoms of ADHD, such as not paying attention, acting on impulses, and not being able to plan, lead to bad health habits. [3]. Because of these different causes, some people have suggested non-medical or alternative treatments, like dietary changes, to treat or lessen the symptoms of ADHD [4]. Subsequent research should compare the eating habits of children with ADHD to those without ADHD symptoms.

The cause of ADHD cannot be traced back to a single cause. It has been discovered to be multifactorial, but the extent to which each factor contributes to the severity of the disease is yet unknown. Genetics has a significant influence, with evidence indicating that genes involved in neurotransmitter synthesis and metabolism are a potential factor. The parts of the brain essential for organizational processes, inhibitory functions, information processing, and integration of information have been weakened, according to neuron-imaging research. Various prenatal and postnatal factors are among the environmental causes. When a foetus is exposed to certain chemicals, the child's brain development and maturation can be affected [5].

Children with ADHD have been found to have low levels of copper, iron, zinc, magnesium, and omega-3 fatty acids. Sugar, artificial food colourings, and preservatives are also linked to a higher risk of ADHD [6]. ADHD is linked to harmful behaviours that could cause problems in the family. Keeping these children in line at home and school might be challenging. Qualitative research shows that a child with ADHD acts like a "wrecking ball," and parents often feel like war is happening at home. This hurts relationships and makes it harder for parents to hold down jobs. Most parents say they are under much stress. During the COVID-19 pandemic, children with ADHD had difficulty getting the right food and nutrition.

With this background, the current study has been carried out with the following objectives,

1. To investigate the dietary pattern of ADHD children and to explore the relationship between dietary patterns and foods that need to be avoided (Food Safety).
2. To study the importance/ need for food safety and security awareness among ADHD children.

2. Materials and Methods

2.1 Online Survey Participants

Participants in Chennai were requested to answer an online questionnaire about food safety and security among ADHD children and their challenges in the Covid - 19 pandemic. Data were collected between April 2021- May 2021. Participants were grouped as children aged between 4-12years.

2.2 Survey Design

As a means of collecting data, a quick questionnaire was developed. It was comprised of questions, including both closed- and open-ended inquiries. The application of the questionnaire took between 3 and 5 minutes. The pertinent Institutional Ethical Committee and Ethical Clearance approved the experimental procedure with the certification number AUW/IHEC/FSN-20-21/XPD-27.

2.3 Questionnaire Instrument

In addition to closed-ended questions, the questionnaire includes rating-scale, multiple-choice, and open-ended questions. The first component required demographic data, including gender and age. In the second section, there are questions about how children with ADHD symptoms have dietary patterns, what foods they should avoid, and how easy it is to get food during the COVID-19 epidemic.

2.4 Statistical Analysis

For data analysis, the software application Statistical Package for the Social Sciences (SPSS) was applied. The association between nutrition and diagnosed ADHD severity was determined using descriptive statistics and cross-tabulation. The facts are presented as the mean, standard deviation (SD), and statistically significant variations between means at the 1% level are indicated. T-tests were utilized to determine the correlation between dietary patterns and food safety in children with ADHD, and the correlation was deemed statistically significant at the 1% and 5% levels.

3. Results:

The present study was supported by Swansburg (2021) [7] and revealed that the investigator had examined the demographic variable that the mean age of the ADHD children was 5.78 ± 2.21 years. Sixty-four per cent of the respondents were boys, and the remaining 36 per cent were girls.

3.1 Dietary pattern of ADHD children

Table 1 shows the dietary pattern consumed by ADHD levels in children. The chi-square comparison shows the dietary consumption and level of ADHD diagnosed in the children.

Table 1: Dietary pattern of ADHD children

Foods consumed	Daily	Weekly	Monthly	Occasionally
Indian Foods				
Vegetables	23 (41.82)	15 (27.27)	8 (14.55)	9 (16.36)
Fruits	17 (30.91)	19 (34.55)	11 (20.00)	8 (14.55)
Pulses	21 (38.18)	15 (27.27)	12 (21.82)	7 (12.73)
Cereals	19 (34.55)	15 (27.27)	12 (21.28)	9 (16.36)
Meat and poultry	14 (25.45)	14 (25.45)	11 (20.00)	16 (29.09)
Sea Foods	2 (3.64)	5 (9.09)	29 (52.73)	19 (34.55)
Dairy Products	9 (16.36)	13 (23.64)	24 (43.64)	9 (16.36)
Sweets	5 (9.09)	9 (16.36)	24 (43.64)	17 (30.91)
Western Foods				
Packed foods	7 (12.73)	19 (34.55)	21 (38.18)	8 (14.55)
Cheese items	5 (9.09)	9 (16.36)	29 (52.73)	12 (21.82)
Processed foods	9 (16.36)	15 (27.27)	21 (38.18)	10 (18.18)
Junk foods	8 (14.55)	9 (16.36)	12 (21.82)	26 (47.27)

It can be seen from the table that the intake of Indian cuisine is greater among the selected respondents of children with ADHD syndrome. Vegetables, fruits, pulses, and grains are among the vegetarian foods available in India, as are meat, seafood, dairy products, and sweets. On average, 13.7 per cent of people consumed food related to Indian cuisine on a daily basis, while 13 per cent consumed them weekly. Monthly consumption revealed that 16.3 per cent consumed Indian foods on a monthly basis, while 11.7 per cent consumed them only occasionally. At the same time, consumption of western foods such as packed foods, cheesy

items, processed foods and junk foods among the selected respondents showed that, on average, 7.2 per cent consumed it daily followed by 13 per cent consuming it weekly, whereas 20.7 per cent consumed it monthly and 14 per cent had the habit of consuming it occasionally.

It can be identified through the study that children with ADHD syndrome consumed Indian foods in higher numbers, and daily they consume some Indian food in their diet, whereas occasionally they prefer consuming western foods in their diet. This was similar to the findings by Woo *et al.*, (2014) [8], where children with ADHD preferred traditional food over western food.

Table 2: Relationship between Dietary patterns of ADHD children with gender

Foods consumed	Mean±SD	t-value	Sig.
Vegetables	2.22±0.57	3.256	0.001*
Fruits	2.12±0.21	3.785	0.023**
Pulses	2.32±0.78	1.256	0.028**
Cereals	2.45±0.81	1.689	0.015**
Meat and poultry	2.15±0.86	4.652	0.003*
Sea Foods	2.45±0.35	2.235	0.001*
Dairy Products	2.23±0.49	3.978	0.000*
Sweets	2.98±0.55	2.362	0.003*
Packed foods	2.78±0.87	3.215	0.003*
Cheese items	2.48±0.58	3.547	0.001*
Processed foods	2.14±0.98	4.569	0.001*
Junk foods	2.87±0.96	4.214	0.000*

*=Significant at 1% level, **=Significant at 5% level,

The dietary patterns of ADHD children with gender showed a significant relationship between the selected variables as they are statistically significant either at a 1 per cent or 5 per cent level of significance.

Vegetables, meat and poultry, sea foods, dairy products, sweets, packed foods, cheese items, processed foods and junk foods were consumed more by the ADHD children equally by both genders. The study of Shareghfaridet al supports this finding.,(2019) [9], where gender is being significantly related to the type of food consumed by children with ADHD.

The comparison between dietary consumption and the level of ADHD diagnosed is given in the below table:

Table 3: Association between dietary consumption and level of ADHD diagnosed

Foods consumed	Calculated Value	Df	P-Value
Indian foods	9.141	2	0.002*
Western Foods	17.212	2	0.000*

*=Significant at 1% level, **=Significant at 5% level,

The chi-square result examined the association between dietary consumption and level of ADHD diagnosed in the children. The result showed that children consuming western foods had been diagnosed more levels of ADHD than children consuming Indian foods, which is

related to the research made by Howard *et al.*, (2010)[10] in which they stated that ADHD diagnosis was not associated with the "Healthy" dietary pattern.

3.2. Foods to be avoided for ADHD children

Table 3 depicts the various foods to be avoided by ADHD children and the knowledge of food security.

Table 4: Foods to be avoided for ADHD children

Foods consumed	Accepted	Neutral	Do not accept
Frozen Foods	24 (43.64)	20 (36.36)	11 (20.00)
Packed Items	26 (47.27)	22 (40.00)	7 (12.73)
Junk Foods	19 (34.55)	25 (45.45)	11 (20.00)
Sea Foods	18 (32.73)	27 (49.09)	10 (18.18)
Meat and poultry	14 (25.45)	29 (52.73)	12 (21.82)
Artificial Coloured Foods	16 (29.09)	27 (49.09)	12 (21.82)
Saved Ice Desserts	21 (38.18)	18 (32.73)	16 (29.09)
Candy or Chocolates	15 (27.27)	26 (47.27)	14 (25.45)
Western foods	26 (47.27)	18 (32.73)	11 (20.00)

Among foods to be avoided for children with ADHD syndrome, the researcher has identified nine items: frozen foods, packed foods, junk foods, sea foods, meat and poultry, artificial coloured foods, saved ice desserts, candy or chocolates and western foods. Respondent's responses for the foods to be avoided for ADHD children showed that, on average, 19.8 per cent accepted that these foods are to be avoided by the children, whereas 23.5 per cent had a neutral decision for the food items and 11.5 percent did not accept the foods to be avoided in their dietary pattern identified to be correct. The same is being explored by Abbasi *et al.*, (2018) [11] in which two major dietary patterns were identified: healthy and Western. The healthy dietary pattern was rich in fruits, vegetables, vegetable oils, whole grains, legumes, and dairy products. The Western pattern was rich in processed meat, red meat, pizza, eggs, snacks, animal fat, hydrogenated fat, and salt. A healthy dietary pattern was associated with lower odds of having ADHD.

It is found from the study that the majority of the respondents are aware of foods to be avoided for children with ADHD syndrome.

3.3. Relationship between general characteristics and Comorbidity

The researcher has employed multiple regression models to explore the association between Dietary patterns and food safety in children with ADHD. The model's results are listed in the following table.

Null hypothesis Ho: "There is no significant relationship between the independent and dependent variable of the selected respondents."

Table 5: Relationship between dietary pattern and Food safety on ADHD children

Variable	R	R ²	F-value	Sig.	Standardized Coefficients	T	Sig.
Frozen Foods	.789	.652	13.785	0.000*	.412	3.214	0.004*
Packed Items					.128	1.569	0.023**
Junk Foods					.236	2.562	0.012**
Sea Foods					.654	5.265	0.001*
Meat and poultry					.489	3.198	0.003*
Artificial Colored Foods					.253	2.348	0.011**
Saved Ice Desserts					.458	3.546	0.004*
Candy or Cholates					.389	3.189	0.003*
Western foods					.254	2.678	0.005**

*= Significant at 1% level, **= Significant at 5% level, NS= Not Significant

Dependent variable: Food Safety

Frozen Foods, Packed Items, Junk Foods, Sea Food, Meat and Poultry, Artificial Coloured Foods, Saved Ice Desserts, Candy or Chocolates, and Other Foods such as Pizza, Burger, etc., are the variables used in the regression analysis, and all of them are statistically significant at either the 1% or 5% level of significance. The 'R' squared value indicates the model's goodness of fit, and its value of 0.652 indicated that 65 per cent of the variation was impacted by the cumulative effect of all independent variables.

Thus, the regression analysis revealed a correlation between Dietary patterns and food safety in children with ADHD. This is similar to Marticella *et al.*, (2022) [12], where Western-like, sweet, and healthy patterns were identified. The ADHD group was negatively associated with the healthy pattern ($p < 0.001$) and positively associated with the Western-like diet ($p = 0.004$). Children with inattentive presentation showed lower adherence (12.2%) to a healthy pattern than that of the control group (39.9%) ($p < 0.001$). There is an association between ADHD and dietary habits; children with the inattentive presentation may be at risk of unhealthy eating habits.

The researcher investigated data about food availability and the Covid-19 outbreak. Food is essential for individual and global health, even though current food production and consumption practices have significant environmental consequences. In contrast, events such as the COVID-19 epidemic can alter our relationship with food and disturb the food chain. State and District boundaries and other logistical restrictions limiting the flow of products and people, for example, raised the likelihood of food shortages caused by disrupted supply chains, especially those tied to labour shortages. The 2019 Coronavirus illness (COVID-19) epidemic prompted a global lockdown in India. All schools were shuttered, and courses were suspended, with some schools resuming at least some online classes. Due to the lockdown, the youngsters are anticipated to remain in residence. Staying inside the home during a lockdown is considered exceedingly challenging for children with ADHD, and giving the necessary nutritional supplements and healthy foods has become a major concern for many parents, particularly

children with ADHD syndrome. The researcher examined data regarding food availability and the coronavirus-19 epidemic. The result has been given in table 5

Table 6: Food availability and Covid-19 Pandemic

Variable	SA	A	N	D	SD
Cannot give nutritional foods	9 (16.36)	10 (18.18)	21 (38.18)	9 (16.36)	6 (10.90)
No availability of particular foods	10 (18.18)	11 (20.00)	17 (30.91)	9 (16.36)	8 (14.55)
Financial crises to provide special foods	19 (34.54)	12 (21.82)	15 (27.27)	5 (9.09)	4 (7.27)
Health affected due to lack of supply of healthy foods	11 (20.00)	13 (23.64)	16 (20.09)	8 (14.55)	7 (12.73)
Increase in the consumption of junk foods	10 (18.18)	11 (20.00)	19 (34.55)	8 (14.55)	7 (12.73)
Lack of concentration on one child	9 (16.36)	12 (21.82)	17 (30.91)	8 (14.55)	9 (16.36)

SA= Strongly Agree, A=Disagree, N=Neutral, D=Disagree, SD=Strongly Disagree

From the above table, 38.1 percent of the sample respondents were in the neutral stage in response to the statement "cannot provide nutritional foods," compared to the statement "no availability of particular food." The statement "financial crises to provide special foods" showed that 34.54 percent strongly agreed. The statement "Health affected due to lack of supply of healthy foods" was agreed by 23.6 percent of respondents. "Increase in the consumption of junk foods" was kept neutral by 34.5 percent of respondents.

Thus during the pandemic providing healthy foods and the sudden financial crisis was the primary concern for many respondents in caring for their children with ADHD syndrome. A similar study made by Pecor (2021) [13] COVID-19 pandemic has presented many challenges to caregivers of children. Families with children with attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) are an understudied but potentially vulnerable population to changes during the outbreak.

The investigator used a correlation matrix to examine the correlation between Food availability and Covid-19 Pandemic. The result of the correlation analysis can be seen in table 10.

Table 7: Correlation Matrix Showing Related Variables Characteristics of ADHD children

		Cannot give nutritional foods	No availability of particular foods	Financial crises to provide special foods	Health affected due to lack of supply of healthy foods	Increase in the consumption of junk foods	Lack of concentration on one child
Cannot give nutritional foods	Pearson Correlation	1					
	Sig. (2-tailed)						
No availability of particular foods	Pearson Correlation	0.785*	1				
	Sig. (2-tailed)	0.000					
Financial crises to provide special foods	Pearson Correlation	0.689*	0.752*	1			
	Sig. (2-tailed)	0.001	0.000				
Health affected due to lack of supply of healthy foods	Pearson Correlation	0.845*	0.785*	0.985*	1		
	Sig. (2-tailed)	0.002	0.000	0.000			
Increase in the consumption of junk foods	Pearson Correlation	0.756*	0.892*	0.897*	0.956*	1	
	Sig. (2-tailed)	0.001	0.000	0.000	0.000		
Lack of concentration on one child	Pearson Correlation	0.786*	0.896*	0.759*	0.789*	0.715*	1
	Sig. (2-tailed)	0.002	0.000	0.003	0.000	0.003	

*Significant at 1 percent level, **Significant at 5 percent level

Food availability during the Covid-19 pandemic was challenging and increased the chance of ADHD levels. It can be understood from the correlation analysis that the selected variables are correlated with each other either at 1 per cent or 5 per cent level of significance. This is also mentioned in the study by Shah (2021) [14], where they stated that lockdown resulted in worsening symptoms among children with ADHD, and it had an impact on the interaction pattern of the children and parents.

5. Discussion:

Food is one of the basic necessities of life. Eating healthy food and staying healthy is every people's concern in this modernized society. In the case of children providing the best nutrient supplement and giving nutritional food is the utmost significant concern for parents. In the case of children with ADHD, this becomes most crucial, as healthy food is needed to maintain their healthy behaviour and brain development. The dietary pattern of the selected children with ADHD showed that they preferred Indian foods over modern foods though they prefer western foods in their diet too. They eat vegetables, fruits, pulses, and cereals daily in their diet, as Indian cuisine is known for its pulses and cereals. When Indian food is made, it includes vegetables, onions, and pulses in it. Every main Indian dish comes with a variety of side dishes, some of which are good for your health. The children of ADHD rarely prefer the consumption of western foods among the western food packed foods, and cheesy foods are highly preferred by them.

The dietary pattern and gender are significant as India is known for its social norms and customs in which the male child is offered extra food than the girl child in the family, and even the dietary pattern is found to be different between both genders.

The foods to be avoided by the children with ADHD includes junk foods, highly sweetened foods, foods with more oil in them etc. and the majority of the respondents were found to be accepting the foods listed by the investigator as those foods are to be avoided in order to maintain a healthy lifestyle. Frozen Foods, Packed Items, Junk Foods, Sea Food, Meat and Poultry, Artificial Coloured Foods, Saved Ice Desserts, Candy or Chocolates, and Other Foods such as Pizza, Burger, etc. have an impact on the health condition of the selected children.

When the unexpected pandemic hit, the whole nation collapsed, borders were sealed, shops were closed, and meeting the daily requirements was at greater risk for the people. In that case, the viability of foods, vegetables, and fruits was minimal, and even the cost was at a higher price. So, providing the needed foods for the children with ADHD was difficult for their parents due to unavailability and costlier. As everyone was under restriction, being at home tended to the children to have more snacks and food, and due to the lockdown, it was tough to provide for their needs by their parents, and it became their primary concern.

6. Conclusion:

The average age of the selected subjects in the study was 5.78 years. Sixty-four per cent of the respondents were male, while the remaining thirty-six per cent were female. Children with ADHD syndrome consumed Indian meals more frequently, and some Indian food was consumed daily, although they occasionally preferred western foods. Children who consume western cuisine have been diagnosed with attention deficit hyperactivity disorder (ADHD) at

higher levels than those who consume Indian foods. Most responders are aware of foods children with ADHD syndrome should avoid. Children with ADHD have a significant association between eating patterns and food safety. During the pandemic, the provision of nutritious diets and the abrupt onset of a financial crisis were the primary concerns of many responders who cared for children with ADHD syndrome.

Acknowledgement

The author declares that there is no conflict of interest and no financial assistance to perform this study.

References:

- [1].Doernberg, E., and Hollander, E. (2016). Neurodevelopmental disorders (asd and adhd): dsm-5, icd-10, and icd-11. *CNS spectrums*, 21(4), 295-299. DOI: [10.1017/S1092852916000262](https://doi.org/10.1017/S1092852916000262)
- [2].Mostafavi, S. A., Mohammadi, M. R., Hosseinzadeh, P., Eshraghian, M. R., Akhondzadeh, S., Hosseinzadeh-Attar, M. J., ... & Keshavarz, S. A. (2012). Dietary intake, growth and development of children with ADHD in a randomized clinical trial of Ritalin and Melatonin co-administration: Through circadian cycle modification or appetite enhancement?. *Iranian journal of psychiatry*, 7(3), 114.
- [3].Holton, K. F., &Nigg, J. T. (2020). The association of lifestyle factors and ADHD in children. *Journal of attention disorders*, 24(11), 1511-1520. doi: 10.1177/1087054716646452.
- [4].Salvat, H., Mohammadi, M. N., Molavi, P., Mostafavi, S. A., Rostami, R., &Salehinejad, M. A. (2022). Nutrient intake, dietary patterns, and anthropometric variables of children with ADHD in comparison to healthy controls: a case-control study. *BMC pediatrics*, 22(1), 1-9. doi: 10.1186/s12887-022-03123-6.
- [5].Prabhakar, A. (2016). A Study of Etiology, Nutritional Intake and Micronutrient Profile Of 4-12 Year Old Children with Attention Deficit Hyperactivity Disorder (ADHD) in Special Schools of Chennai City (Doctoral dissertation, Department of Biochemistry and Molecular Biology, Pondicherry University).
- [6].Millichap, J. G., & Yee, M. M. (2012). The diet factor in attention-deficit/hyperactivity disorder. *Pediatrics*, 129(2), 330-337. doi: 10.1542/peds.2011-2199.
- [7].Swansburg, R., Hai, T., MacMaster, F. P., & Lemay, J. F. (2021). Impact of COVID-19 on lifestyle habits and mental health symptoms in children with attention-deficit/hyperactivity disorder in Canada. *Paediatrics & child health*, 26(5), e199-e207. doi: 10.1093/pch/pxab030.
- [8].Woo, H. D., Kim, D. W., Hong, Y. S., Kim, Y. M., Seo, J. H., Choe, B. M., ... & Kim, J. (2014). Dietary patterns in children with attention deficit/hyperactivity disorder (ADHD). *Nutrients*, 6(4), 1539-1553. doi: 10.3390/nu6041539.
- [9].Shareghfarid, E., Sangsefidi, Z. S., Salehi-Abargouei, A., &Hosseinzadeh, M. (2020). Empirically derived dietary patterns and food groups intake in relation with Attention

-
- Deficit/Hyperactivity Disorder (ADHD): A systematic review and meta-analysis. *Clinical nutrition ESPEN*, 36, 28-35. doi: 10.1016/j.clnesp.2019.10.013.
- [10]. Howard, A. L., Robinson, M., Smith, G. J., Ambrosini, G. L., Piek, J. P., & Oddy, W. H. (2011). ADHD is associated with a "Western" dietary pattern in adolescents. *Journal of attention disorders*, 15(5), 403-411. doi: 10.1177/1087054710365990
- [11]. Azadbakht, L., & Esmailzadeh, A. (2012). Dietary patterns and attention deficit hyperactivity disorder among Iranian children. *Nutrition*, 28(3), 242-249. doi: 10.1016/j.nut.2011.05.018.
- [12]. Rojo-Marticella, M., Arija, V., Alda, J. Á., Morales-Hidalgo, P., Esteban-Figuerola, P., & Canals, J. (2022). Do Children with Attention-Deficit/Hyperactivity Disorder Follow a Different Dietary Pattern than That of Their Control Peers?. *Nutrients*, 14(6), 1131. doi: 10.3390/nu14061131.
- [13]. Pecor, K. W., Barbayannis, G., Yang, M., Johnson, J., Materasso, S., Borda, M., ... & Ming, X. (2021). Quality of Life Changes during the COVID-19 Pandemic for Caregivers of Children with ADHD and/or ASD. *International journal of environmental research and public health*, 18(7), 3667. doi: 10.3390/ijerph18073667
- [14]. Shah, R., Raju, V. V., Sharma, A., & Grover, S. (2021). Impact of COVID-19 and lockdown on children with ADHD and their families—an online survey and a continuity care model. *Journal of Neurosciences in Rural Practice*, 12(01), 071-079. doi: 10.1055/s-0040-1718645.
- [15]. Asken, M. J., Grossman, D., & Christensen, L. W. (2007). American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Arlington, VA: American Psychiatric Publishing, 2013. Archibald, Herbert C., and Read D. Tuddenham. "Persistent Stress Reaction after Combat: A 20-Year Follow-Up." *Archives of General Psychology. Therapy*, 45(10), 2317-25.
- [16]. Cormier, E., & Elder, J. H. (2007). Diet and child behavior problems: fact or fiction?. *Pediatric nursing*, 33(2).
- [17]. Mohammadi MR, Ahmadi N, Khaleghi A, Mostafavi SA, Kamali K, Rahgozar M, et al. Prevalence and correlates of psychiatric disorders in a national survey of Iranian children and adolescents. *Iran J Psychiatry*. 2019;14(1):1.
- [18]. Wang, L. J., Yu, Y. H., Fu, M. L., Yeh, W. T., Hsu, J. L., Yang, Y. H., ... & Pan, W. H. (2019). Dietary profiles, nutritional biochemistry status, and attention-deficit/hyperactivity disorder: path analysis for a case-control study. *Journal of clinical medicine*, 8(5), 709. doi:10.3390/jcm8050709