
Stress Resolution in Mothers of Autism Spectrum Children: An Efficacy Study of Healthy Lifestyle Practices

Sadaf Zafar^{1*}, Samia Khalid², Sonia Mairaj Ahmad³**Abstract**

Autism spectrum disorder (ASD) is a disorder of developmental disability that affects not only the child but their parents too. These children need support in routine chores, education, and rehabilitation that are permanent stressors of mothers with ASD children. Present research is an effort to understand these stressors of mothers with an efficacy study of healthy practices in daily life routine. This research aimed to improve the life of ASD children's mother through daily life style practices. Study was based on pre-posttest quasi experimental research design and purposive sampling technique to select the sample of mothers with ASD children. Perceived stress scale was used as pre and posttest task. Six weeks' intervention plan of daily life practices were scheduled according to mother's availability which contained guidelines related to healthy food, importance of nocturnal sleep, physical activity, stress management, social connection, and spirituality. Sessions were conducted individually with one-week gap. Results revealed significant positive impact of this plan on mother's perceived stress. Mothers of ASD children reported low levels of stress after the modification of their daily life practices. Finding further elucidates the importance of healthy life practices as coping skill to omit permanent stressors.

Keywords: Daily Life Practices, Mothers of ASD Children, Perceived Stress

Received: 19 April 2023; Revised
Received: 27 June 2023; Accepted: 28 June
2023

^{1*}Lecturer, Govt. Associate College for Women, Bhopalwala, Sambrial, Distt. Sialkot, Pakistan.

²Senior Lecturer, Institute of Clinical & Professional Psychology, Riphah International University, Lahore Campus, Pakistan.

³Assistant Professor, Department of Psychology, University of Central Punjab, Lahore, Pakistan.

***Corresponding Author Email:**

sadafzafar4441@gmail.com

Introduction

The feelings and thoughts a person has about the stress one is going through at a specific time is described as perceived stress (Cohen et al., 1983; Torales et al., 2020). It induces the emotions of unpredictability and uncontrollability in a person's life. It deals with how the

individual is managing stressful thoughts, and how that person is dealing issues and problems. Perceived stress doesn't look into the reasons which induce stress to someone but how someone commonly feels about stressful situations and his/her ability to cope up with it.

Autism spectrum disorder is a neurodevelopmental disorder with the lack of social communication and interaction, and constrained restricted styles of behavior, hobbies, and activities. It comorbid with different disorders, which include intellectual delay, conduct disorder, gastrointestinal problems, attention problems, aggression, epilepsy, bad ingestion sleep issues, and reduced motor coordination. These problems effect the normal development of child (Greening, 2020; Kiami & Goodgold, 2017). Among all the neurodevelopmental issues, autistic spectrum disorder is most complicated (Weiss et al., 2014). ASD has an effect upon the mental health of entire family of the child (Bluth et al., 2013; Yilmaz et al.,

This article is distributed under the terms of the Creative Commons Attribution Non Commercial 4.0 International License (<https://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified.

© Copyright: The Authors (2023)

2021). A widespread quantity of study on stress in mother and father of children with ASDs has found that these parents reveal high levels of stress than both the general populace and caregivers of children with other neurodevelopmental delays (Dimachkie et al., 2023).

Among all family members, the most close and intimate relation in nature is of mother. Parenting children with regular developmental patterns require struggle but this warfare becomes existence-lengthy when an infant with developmental delay is born in the family. Bringing up a toddler with special needs invites emotional problems and stress, mainly whilst the character of disability is associated to a number of the unknown elements and unsure future treatments. As a result, stress is caused in mothers. This stress possibly causes mental disturbances and issues in them (Aniruddh et al., 2017; Pacis, 2023). Bulk of literature is evidence that mental stress, depression, and burnout amongst the mother of ASD children are high in comparison to mothers of children without developmental delays (Kutuk et al., 2021; Ludlow et al., 2012).

Lifestyle medication specializes in instructing and encouraging patients to enhance the quality of their lives via modifying personal behavior, using whole meals, plants-most important nutritional routine, consistent involvement in physical activities, good sleep, management of stress, prevention of drugs and satisfactory social relationships. In the health facility, fundamental limitations to way of life style therapy are that physicians are inexperienced for this approach and are skeptical about their clients' receptivity (Lacagnina et al., 2021). For clients, life style medicine is an efficient method for treatment as it is related to daily life practices. Patients learn to manage themselves and stress. And better access for self-care. It helps to deal with chronic diseases (Brennan et al., 2011). In lieu of the importance of lifestyle medicine, present research aimed to improve the life

of ASD children's mother through daily life style practices.

Lifestyle Medicine is based upon bio psychosocial model. It targets the lifestyle of an individual that includes eating and sleeping patterns, social interaction, physical activity, substance related behavior and spiritual approach. It covers the all the domains of life that impacts persons mental and physical well-being (Marx et al., 2023; Polak et al., 2015).

Caring for a child with autism spectrum disorder (ASD) is a challenge for mothers that can affect their health and wellbeing. It was examined the level of maternal fatigue and its relationship to health and other aspects of parenting. 50 mothers with autistic children between the ages of 2 to 5 years participated in that study. Mothers reported more fatigue and health related problems. Factors associated with fatigue are poor sleep, need for social support, and poor physical activity. Fatigue was also associated with other aspects of health, such as stress, anxiety and depression, and with parental functioning and satisfaction. Resulted concluded the need of programs that address parental fatigue and its effects on families with ASD children (Giallo et al. 2013; Tathgur & Kang, 2021).

Similar study was conducted (Boyd, 2002; Robinson & Weiss, 2020) to examining the relationship between stress and lack of social support in mothers of children with autism. A review of the published literature reveals an association between the child's challenging characteristics and the mother's propensity to seek social support, with mothers under greater stress being more likely to seek social support. For mothers of children with autism, informal support appeared to be a more effective buffer against stress than formal support. The cumulative results of several studies showed that mothers who received support had better emotional relationships with their children. Additionally, low levels of social support were the most effective predictors of maternal depression and anxiety.

Fukuie et al. (2023) conducted research aimed to uncover key lifestyle elements that improve the physical and mental health of college students, focusing on physical activity, nutrition, and sleep. 290 first-year students participated in this cross-sectional study. Outcomes were daily step counts measured using accelerometers, dietary intake by nutrient category, sleep duration, subjective sleep quality, exercise frequency and duration by exercise type, screen time, depression level, and subjective fatigue by body part. Subjective sleep quality could be a key factor for high mental and physical health. In addition, performing aerobic and relaxation exercises and reducing screen time are important for improving subjective sleep quality.

Rationale of the Study

The Pakistan Autism Society has estimated that approximately 400,000 children in Pakistan are suffering from ASD (Furrukh & Anjum, 2020). It has been observed that mothers of ASD children go through the stress when they try to manage the problem of their child. Mothers go through the higher levels stress as compared to fathers (Bluth et al., 2013; Kutuk et al., 2021). These mothers give maximum energy and time to their children that they overlook their own health. This stress affects their mental and physical health negatively. If they work on upon their physical and mental health they would be in better position to manage their children. This study aimed to evaluate the resolution of stress in mothers with ASD children, and the interventional effect of lifestyle intervention through healthy practices in daily life routine.

Objectives

The objective of this study is:

- To see the interventional effect of lifestyle practices in stress resolution ability of mothers with autism spectrum disorder.

Hypothesis

1. Lifestyle Intervention would have significant positive effect on stress resolution ability of mothers with ASD children.

Method

Research Design

The pretest posttest quasi-experimental research design was used.

Sample

Mothers of children diagnosed with ASD were recruited through purposive sampling technique. Thirteen graduated mothers from Lahore, Pakistan selected as a sample. They all were stressed and hadn't been in any therapy initially. The age range of mothers was 25-45 years. Most of them belonged to middle class background. The rationale to include mothers is, that mothers have more frequently role in child rearing and they experience higher level of stress as compared to fathers (Bluth et al., 2013).

Measures

Demographic Information Sheet

The demographics information sheet was used to find characteristics of sample for example age, gender, marital status, religion, education, number of children, family system, physical, and psychological status. The aim of obtaining a demographics sheet was to get information about those characteristics of a sample which were not directly gained by the use of questionnaires.

Daily Lifestyle Practices Checklist

A self-developed Daily lifestyle Practices Checklist based on the theory of lifestyle medicine (Frates & Kelley, 2020) was used to measure the type of food consumption, water intake, sleep and physical activity of mothers. This checklist consists of open ended questions. Along with initial demographics, it also measures the weight and height of participants. It assesses the presenting complaints of patients regarding their psychological physical health. It also examines their current medication.

Perceived Stress Scale (PSS)

Perceived stress scale (Cohen, 1983) was used to assess the stress level of mothers. The Perceived Stress Scale (PSS) consisted of 10 items. The items of PSS were rated on five point Likert scale. High score shows more stress in mothers, The reliability of the PSS was 0.85 and 0.55. Concurrent

validity and predictive was found and Cronbach's alpha was found .75. The face validity of the scale was determined. .81 was the correlation between the two versions of the scale.

Procedure

Approval was taken from the department to conduct the research. All the ethical guidelines were followed. Participant's confidentiality was maintained. Permission regarding use of tools was taken from the related authors. No psychological or physical harm was given to them. Participants were selected through purposive sampling. 60 participants were approached for the present study. Only 25 agreed to participate in research. Later on, due to lengthy duration of intervention only 13 participants continued it.

Phases of Study

Phase I: Screening

Initial screening test was used. PSS scale was used to assess stress level. Checklist of daily life practices was used to measure food, water intake, sleep or workout level.

Phase II: Intervention

6 sessions were planned in which their stress history and self-care routine were interviewed. Then, daily life practices guidelines were provided to them as a couch. Sessions were given individually. They were counseled and information was also shared in form of pamphlets and videos.

Intervention was done in six sessions. First session was based on initial screening tests, session 2 to 5 covered the four pillars of Lifestyle medicine i.e., food, sleep, physical activity and social relationships and in 6th session post assessments were made (Hyman et al., 2009; Lianov et al., 2022).

Session 1: In first two weeks, initial screening tests were used. Perceived Stress Scale was used to assess the stress level of mothers. It was found that 9 participants were having high stress level i.e., from 27-40. Only 4 of 13 were having moderate level of stress i.e., 14-26. Self-created lifestyle medicine checklist was used to

measure daily life practices of mothers i.e., food, water intake, sleep pattern and level of their physical activity. Acidity, stomach pain, constipations, loss of appetite, muscle stretch, sleep problem, blood pressure issue, stress, and problem in social relationships were the main issues reported by them. 3 mothers reported that they were having acidity problem they often feel chest burning. 9 participants said they face stomach related problems in their routine. 2 mothers reported of having constipations. 3mothers said they were having loss of appetite. 6 mothers reported of going through muscle stretch and pain. 3 of them were having sleep problem. 1 mother was having blood pressure issue. And 6 of them said they were having problem in social relations.

Session 2: During week 3 for formal permission, an informed consent filled by the mothers. they were provided guidelines about food intake. Initially food intake patterns were discussed then importance of right and desired food intake was discussed with them. They were guided that they should take breakfast early morning until 8am. Lunch should be light. It can be salads. And dinner must be taken between 7 to 9pm. They should keep their body hydrated. Water must be drunk half an hour before meals not after or during the meals. If they like sweet dishes, then they should choose natural sugars like those fruits which are more sweet instead of artificial sweets like cakes and ice-creams. Soft and cold drinks must be avoided. Instead of milk black tea should be preferred. If they like junk food, they can take it but a very specific amount and after a specific duration.

Session 3: In 3rd session of treatment, importance of sleep and related problems were discussed. It was reported by them that they were having problem in falling asleep and during day time they feel lazy and dizzy. They were counseled that to stay mentally and physically fit 7 to 8 hours sleep is mandatory. They must sleep between 9 to 11pm. They must not drink

water and any liquid after 7pm. Or a minimum amount could be taken according to body need. Cell phones must be turned off and for alarms; alarm clocks can be used instead of smart phones. They can also deep breathe or meditate before sleeping.

Session 4: During the 4th session, participants were guided about the importance of physical activity. They were told that to be a healthy individual one should walk for 150 minutes in a week. Total duration can be divided according to the participant's availability of time. This walk can be done early morning or at evening time. But it should be before meal. If one has problem in going out, they can do it at home or in a room while moving back and forth.

Session 5: In 5th session, participants were guided about social interactions. It is true when mothers have a child with special needs they entirely focus upon their child

and ignore rest of the family members and friends. They limit their life to that child only. Less interactive environment enhances the stress among them. So, it is important that to be socially active and interactive, they should make relations and maintain them. Mothers should divide their time equally to all the members. They should properly attend their husbands and other children too. It will be beneficial for them as they would be able to think about matters also and less stressed.

Session 6: In last week of treatment post assessment was done. All the initially used scales were again implemented upon them. Their stress level was reassessed. It was lowered. And their physical complaints were also taken again.

Phase III: Post Assessment

Participants were reassessed on perceived stress scale and checklist of daily life practices.

Results

Table 1

Descriptive Statistics of Demographics and Other Characteristics of the Participants (N=13)

Variables	f	%	Variables	f	%
Mother's Age			No. of Children	3	23.07
25-30	3	23.07	1	5	38.46
31-35	7	53.84	2	4	30.76
36-40	2	15.38	3	1	7.69
41-45	1	7.69	4		
Family System					
Joint	8	61.53			
Nuclear	5	38.46			

Note. f =Frequencies of variables, % = Percentage

Table 1 demonstrates the frequencies and percentages of all the characteristics of members of the research. The age of participants was between 25-45 years. Furthermore, regarding education, all the participants were graduated. All the mothers were house wives. However, 3

participants were having single born child, 5 of them were having 2 children, 4 were mothers of 3 numbers of children and only 1 participant was having 4 children. Among 13, 8 participants belonged to joint family system, and 5 of them belonged to nuclear family system.

Table 2

Demographic Characteristic associated to Contributory Factor of Psychological Problems of Participants (N=13)

<i>Variables</i>	<i>F</i>	<i>%</i>	<i>Variables</i>	<i>F</i>	<i>%</i>
Family support			Muscle pain		
Yes	3	23.07	Yes	6	46
No	10	76.92	No	7	54
Pre therapy treatment			Dizziness		
Yes	0	0	Yes	3	23
No	13	100	No	10	77
Physical illness in family			Blood pressure		
Yes	0	0	Yes	1	8
No	13	100	No	12	92
Psychological illness in family			Headache		
Yes	0	0	Yes	4	30
No	13	100	No	9	70
Acidity problem			Sleep problem		
Yes	3	23	Yes	5	39
No	10	77	No	8	61
Stomach pain			Water intake		
Yes	9	70	Satisfactory	3	23
No	4	30	Non-satisfactory	10	77
Constipation			Food intake habits		
Yes	1	8	Satisfactory	4	30
No	12	92	Non-satisfactory	9	70
Loss of appetite					
Yes	3	23			
No	10	77			

Note. *f*=Frequencies of Variables, %=Percentage

Table 2 demonstrates that only 3 of 13 participants get family support in managing their children while 10 of them don't get any support from family to manage their child. Among 13 participants none of them were previously involved in any therapy to manage their stress. And none of them had any physical and psychological illness in their family.

In health perspective this table shows that 23% mothers were having acidity problem,

70% participants were having stomach pain, 8% were having constipation complaint and 8% were experiencing loss of appetite. 46% mothers having muscle stretch in physical complaints. 3 mothers were going through dizziness throughout days. Among 13 participants, 1 of them was having blood pressure issue. 30% mothers had headache and 39% were facing sleep problem. 70% participants were unsatisfied by their water and food intake habits.

Table 3

Wilcoxon Signed Rank Test Comparing the Effects of Daily Life Practices on Perceived Stress on the Mothers of ASD Children at Pre and Post Assessment Level (N=13)

	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Mdn</i>	<i>Z</i>	<i>p</i>	<i>r</i>
Pretest	3.36	.31	2.80	4.00	3.40	-3.18	.001	0.63
Posttest	2.44	.23	2.07	2.86	2.43			

A Wilcoxon signed rank test was used because it compares the pre-treatment and post-treatment results. A Wilcoxon signed rank test revealed that perceived stress scores were significantly lower after the intervention ($Md=2.43$, $n=13$) compared to before ($Md=3.40$, $n=13$), $z=-3.18$, $p=.001$, with a large effect size, $r=.63$. There was a significant difference in the stress level in

pre-treatment and post treatment. Through verbal communication it was found that participant's daily routine was also improved. They added healthy food in meals, managed sleep and stress. These were the reasons that lead to significant improvement in level of stress in participants.

Discussion

It was hypothesized that there is an effectiveness of daily life practices upon the perceived stress. The finding supports the hypothesis. Results were also supported by the feedback of the participants who reported significant decrease in level of stress after the implementation of daily lifestyle practices upon them. Participants reported improve in food patterns and mood related issues in present research. This is supported by the research of Khokhar (2021). He found in his research that food and mood are interrelated to each other. The quality of food is eaten has a significant impact upon the moods an individual experience including stress, depression and stress disorders. In present research when quality of certain food like vegetables, fruits, nuts and cereals etc. was improved with certain instructions they experienced less stress level as compared to initial levels. A research was conducted to examine the lifestyle impact upon the quality of sleep and psychological wellbeing of adolescents. So, it was found that lifestyle treatment had a significant impact. In current study, mothers who were suffering from sleep problem also reported that they experienced better quality of sleep after the implementation of lifestyle

treatment that ultimately resulted in lower level of stress. (Kamran et al., 2021). Wong et al. (2023) conducted a meta-analysis to find the efficacy of multicomponent lifestyle medicine (LM) upon the sleep quality upon the diverse adult populations. Results showed that LM practices improved the sleep quality. Similar findings were reported by the research participants too who reported good quality of sleep after implementation of LM practices. It was also found in current research that physical activity had positive impact upon the well-being of mothers and these results are supported from the research conducted by the Maugeri et al. (2020). It was found that regular physical activity has a positive effect upon the individual's mental health. It was beneficial for the parents of ASD children. As they reported they are able to deal with the stress and are having lower levels of stress. Basic strength of the study is that daily life practices can easily be practiced by the participant as they don't need a lot of mentoring or guidance in practice.

The study has however, a lot of methodological limitations. It was a limited group of participants. Due to 6 weeks of treatment participants were not willing to participate in this study. Only few got ready

for it. So, the small sample size has limited the generalizability of our findings to parents of children with ASD in other geographical locations and with different demographics. Moreover, participants were mothers only who vary in levels of stress as compared to fathers. Parents of recently diagnosed children were included only. Above the age of 7 years children's behavior also change so mothers stress level modifies accordingly. This study can be conducted in larger group. Present study examined only perceived stress and effect of life style practices. Other variables e.g., severity of ASD in children, variations in their behavioral issues and parenting styles were not studied that may have an effect upon levels of stress.

In Pakistani culture, parents of special need children have a lot of things to deal, even though they want to involve in such interventions but due to less time they found themselves unable for it. This therapy can be implemented to all those who are suffering from depression and stress. Its use can be made mandatory in institutions who are managing children of Autism Spectrum disorder. They can implement it upon the children's parents. It is also applicable to those who are fighting with diseases based on medical reasons such as cancer.

Conclusion

It can be concluded from the present study that lifestyle intervention has a significant impact upon the perceived stress of the mothers of ASD children. Overall, it can be said that in Pakistan, there is a need of such awareness programs. So that people get aware of the fact that along with care of children with autism, there is need of taking care of parents or caregivers of these children. Only mentally and physically healthy caregivers can help in improving the health of ASD children.

There is no conflict of interest in this research.

Acknowledgements

All the authors who gave permission to use their scales for research, institute who

allowed me to conduct this research and participants are appreciated and acknowledged.

Contribution of Authors

Sadaf Zafar: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft

Samia Khalid: Methodology, Writing - Reviewing & Editing, Supervision

Sonia Mairaj Ahmad: Methodology, Writing - Reviewing & Editing, Supervision

Conflict of Interest

There is no conflict of interest declared by authors.

Source of Funding

The authors declared no source of funding.

Data Availability Statement

The datasets of the current study are not available publicly due to ethical reasons but are available from the corresponding author [S.Z.] upon the reasonable request.

References

- Aniruddh, P. B., Pravesh, B., & Pamela, C. (2017). *Indian Journal of Psychological Medicine*, 39(4), 457–463. [https://doi: 10.4103/0253-7176.211767](https://doi.org/10.4103/0253-7176.211767)
- Bluth, P. N. Roberson, R. M. Billen, & Sams, J. M. (2013). A stress model for couples parenting children with autism spectrum disorders and the introduction of a mindfulness intervention. *Journal of Family Theory & Review*, 5(3), 194–213.
- Boyd, B. A. (2002). Examining the relationship between stress and lack of social support in mothers of children with autism. *Focus on Autism and Other Developmental Disabilities*, 17(4), 208-215.
- Brennan, J., Hwang, D., & Phelps, K. (2011). Group visits and chronic disease management in adults: a review. *American Journal of Lifestyle Medicine*, 5(1), 69-84.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of

- perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- Dimachkie Nunnally, A., Factor, R. S., Sturm, A., Valluripalli Soorya, L., Wainer, A., Taylor, S., Ponzini, M., Abbeduto, L., & Gulsrud, A. C. (2023). Examining indicators of psychosocial risk and resilience in parents of autistic children. *Frontiers in Behavioral Neuroscience*, 17, 1102516. <https://doi.org/10.3389/fnbeh.2023.1102516>
- Frates, B., & Kelley, J. (2020). Lifestyle Medicine: Intensity of Intervention Versus Intensity of Patient Response. *American Journal of Lifestyle Medicine*, 17(3), 371-373.
- Fukuie, T., Inoue, K., & Yamaguchi, A. (2023). Lifestyle Elements for Improving Mental and Physical Health in Japanese University Students: Subjective Sleep Quality is a Common Key Factor. *American Journal of Lifestyle Medicine*, 15598276231156546.
- Furrukh, J., & Anjum, G. (2020). Coping with Autism spectrum disorder (ASD) in Pakistan: A phenomenology of mothers who have children with ASD. *Cogent Psychology*, 7, 1728108. doi: 10.1080/23311908.2020.1728108
- Giallo, R., Wood, C. E., Jellett, R., & Porter, R. (2013). Fatigue, wellbeing and parental self-efficacy in mothers of children with an autism spectrum disorder. *Autism*, 17(4), 465-480.
- Greening, N. K. (2020). Foundations in Autism Spectrum Disorders and Related Neurodevelopmental Disorders: Possible Causes, Characteristics, Diagnosis, and Treatment. *Advances in Social Sciences Research Journal*, 7(7), 293-318.
- Hyman, M. A., Ornish, D., & Roizen, M. (2009). Lifestyle medicine: treating the causes of disease. *Alternative Therapies in Health & Medicine*, 15(6), 12.
- Kamran, S., Khalid, S., & Noor, I. (2021). *Anamolous lifestyle impact on late adolescents quality of sleep and psychological wellbeing*. [Conference Presentation] International Lifestyle Medicine Conference, Lahore, Pakistan.
- Khokhar, M. (2021). *Food and Mood*. [Conference Presentation] International Lifestyle Medicine Conference, Lahore, Pakistan.
- Kiami, S. R., & Goodgold, S. (2017). Support needs and coping strategies as predictors of stress level among mothers of children with autism spectrum disorder. *Autism Research and Treatment*, 2017, 8685950, 1-10.
- Kütük, M. Ö., Tufan, A. E., Kılıçaslan, F., Güler, G., Çelik, F., Altıntaş, E., ... & Kütük, Ö. (2021). High depression symptoms and burnout levels among parents of children with autism spectrum disorders: A multi-center, cross-sectional, case-control study. *Journal of Autism and Developmental Disorders*, 51,1-14.
- Lacagnina, S., Tips, J., Pauly, K., Cara, K., & Karlsen, M. (2021). Lifestyle medicine shared medical appointments. *American Journal of Lifestyle Medicine*, 15(1), 23-27.
- Lianov, L. S., Adamson, K., Kelly, J. H., Matthews, S., Palma, M., & Rea, B. L. (2022). Lifestyle medicine core competencies: 2022 update. *American Journal of Lifestyle Medicine*, 16(6), 734-739.
- Ludlow, A., Skelly, C., Rohleder, P. (2012). Challenges faced by parents of children diagnosed with autism spectrum disorder. *Journal of Health Psychology*, 17, 702-711.
- Marx, W., Manger, S. H., Blencowe, M., Murray, G., Ho, F. Y., Lawn, S.,

- Blumenthal, J. A., Schuch, F., Stubbs, B., Ruusunen, A., Desyibelew, H. D., Dinan, T. G., Jacka, F., Ravindran, A., Berk, M., & O'Neil, A. (2023). Clinical guidelines for the use of lifestyle-based mental health care in major depressive disorder: World Federation of Societies for Biological Psychiatry (WFSBP) and Australasian Society of Lifestyle Medicine (ASLM) taskforce. *The World Journal of Biological Psychiatry: The Official Journal of the World Federation of Societies of Biological Psychiatry*, *24*(5), 333–386. <https://doi.org/10.1080/15622975.2022.2112074>
- Maugeri, G., Castrogiovanni, P., Battaglia, G., Pippi, R., D'Agata, V., Palma, A., Di Rosa, M., & Musumeci, G. (2020). The impact of physical activity on psychological health during COVID-19 pandemic in Italy. *Heliyon*, *6*(6), e04315. <https://doi.org/10.1016/j.heliyon.2020.e04315>
- Pacis, C. M. (2023). Transformed by Parenting Experience: Perspectives, Challenges, and Optimism of Parents of Children with Autism Spectrum Disorder in Their Adulthood. *Eximia*, *9*, 76-146.
- Polak, R., Pojednic, R. M., & Phillips, E. M. (2015). Lifestyle medicine education. *American Journal of Lifestyle Medicine*, *9*(5), 361-367.
- Robinson, S., & Weiss, J. A. (2020). Examining the relationship between social support and stress for parents of individuals with autism. *Research in Autism Spectrum Disorders*, *74*, 101557.
- Tathgur, M. K., & Kang, H. K. (2021). Challenges of the Caregivers in Managing a Child with autism Spectrum Disorder—a Qualitative analysis. *Indian Journal of Psychological Medicine*, *43*(5), 416-421.
- Torales, J., Ríos-González, C., Barrios, I., O'Higgins, M., González, I., García, O., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). Self-Perceived Stress During the Quarantine of COVID-19 Pandemic in Paraguay: An Exploratory Survey. *Frontiers in Psychiatry*, *11*, 558691. <https://doi.org/10.3389/fpsy.2020.558691>
- Weiss, J. A., Wingsiong, A., & Lunsy, Y. (2014). Defining crisis in families of individuals with autism spectrum disorders. *Autism: The International Journal of Research and Practice*, *18*(8), 985–995. <https://doi.org/10.1177/1362361313508024>
- Wong, V. W. H., Ho, F. Y. Y., Wong, Y. S. H., Chung, K. F., Yeung, W. F., Ng, C. H., & Sarris, J. (2023). Efficacy of lifestyle medicine on sleep quality: A meta-analysis of randomized controlled trials. *Journal of Affective Disorders*, *330*, 125-138.
- Yılmaz, B., Azak, M., & Şahin, N. (2021). Mental health of parents of children with autism spectrum disorder during COVID-19 pandemic: A systematic review. *World Journal of Psychiatry*, *11*(7), 388.