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Research Paper

The pattern of Structural Relationships of Quality of Life based on Health-Promoting Lifestyle with the Mediation of Helplessness Tolerance in Mothers with Children with Autism Spectrum Disorder

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ABSTRACT

Objective: The present study was conducted with the aim of examining the pattern of structural relationships of quality of life based on a health-promoting lifestyle with the mediation of helplessness tolerance in mothers with children with autism spectrum disorder.

Methods: The research method was descriptive and correlation-based on structural equations. The statistical population was all the mothers of children with autism in Bushehr who enrolled their children in exceptional schools and also had a case in the Bushehr Autism Association in 2023. From this community, a sample of 200 people was selected by available sampling method and completed the questionnaires on quality of life, health-promoting lifestyle, and tolerance of helplessness. SPSS25 and SmartPLS3 were used to analyze the collected data.

Results: The results of the structural equations showed that the health-promoting lifestyle ($p<0.005$; $\beta=0.24$) has a direct and positive effect on the quality of life and a direct and positive effect on tolerance of helplessness ($p<0.005$; $\beta=0$). Also, the health-promoting lifestyle ($p<0.005$; $\beta=0.18$) has a significant effect on the quality of life through the mediation of helplessness tolerance ($P=0.05$).

Conclusion: The findings of this study can provide evidence for the development of appropriate intervention programs to increase the quality of life among mothers of children with autism through specific health-promoting behaviors.

1. Introduction

Autism spectrum disorder is a widespread psycho developmental disorder that occurs in early childhood, affecting the development of various functions in children, including self-perception, emotions, and language (Hosney et al., 2024). Autistic children cannot live independently, which definitely increases mental pressure and psychological problems, such as social anxiety in parents (Qi et al., 2023). Parents of children with autism suffer from low mental health, high stress, and a poor sense of happiness for a long time(Bohadana et al., 2019). The birth of a child with special needs causes problems for the family (Behnouieh et al., 2022; Kiani et al., 2022). The experience of having a child with autism is unique to each family, given that each member has their own history,

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beliefs, coping skills, socioeconomic status, and support network (Figueiredo & Rangel de Lima, 2020). It often changes the dynamic of the family routine. As a result, family relationships are shaken, as attention is completely focused on these children (Machado et al., 2018). The complex nature of quality of life means that it cannot be assigned to just one domain of life; each domain is influenced by different factors (Liu et al., 2021). It seems that one of the variables related to the quality of life of mothers with children with autism is a health-promoting lifestyle. A healthy lifestyle is a way of life that provides, maintains, and improves a person's health and well-being. The most important health-promoting style factors are healthy eating, physical activity, stress management, interpersonal relationships, spiritual growth, and health responsibility (Jeoung, 2021). Health-promoting behaviors can play an important role in increasing the quality of life by improving behavioral, physiological, and psychological stress responses (Lee et al., 2020). A health-promoting lifestyle is an effective factor in an individual's health status (Zhou et al., 2022). Studies show that a healthy diet, physical activity, healthy body weight, alcohol and tobacco control are associated with lower prevalence of obesity, diabetes, cardiovascular disease, and cancers (Moorehead, 2019). Parents of children with developmental disorders have less health-promoting lifestyles than parents of normal children (Lee et al., 2019). Mothers devote a significant portion of their time and energy to activities related to caring for and coordinating their children's participation in daily life (Bhopti et al., 2019). As a result, they have limited opportunities to participate in health promotion activities for themselves(Bourke-Taylor et al., 2021)**.** Caregiving mothers consistently report spending less time on physical activity, relaxation, self-care, sleep, and access to health care (Gilson et al., 2018). These mothers can experience lower mental health compared to mothers of developing children (Popov, Phoenix & King, 2021)**.** Considerable evidence suggests that mothers of children with disabilities are at increased risk for health outcomes and lifestyle limitations due to caregiving responsibilities (Bourke-Taylor & Jane Peat,2019). Mothers of children with autism spectrum disorder face significant challenges and psychological distress (Nagase et al., 2024). However, mothers of autistic children experience high levels of depression and anxiety and moderate levels of stress (Ali Al-Graiti & Seki Öz, 2024).

Approaches in recent decades in psychology have paid attention to the importance of mediating variables. This issue has drawn the attention of researchers to psychological variables as a mediator. Studies have shown that stress and quality of life do not affect people in the same way, and some variables may mediate this relationship. Tolerance of helplessness is involved in the development and maintenance of depression symptoms and other important psychological conditions (Brown, Burton & Abbott, 2022)**.** Helplessness tolerance is defined as the ability to persist in purposeful challenging behavior in the face of stress (Moschak et al., 2023)**.** A mother's helplessness tolerance is her ability to resist negative emotions, which can reduce her child's behavioral disorders (Mohammadipour, Dasht Bozorgi & Hooman, 2022). The results of Lass & Winer's (2020) analysis show a strong relationship between aspects of coping with helplessness, unhelpful coping behaviors, and depressive symptoms. McDonald et al (2022) showed in their research that there is a significant relationship between tolerance of helplessness and mindfulness with mental health. The results of the study by Husseini et al (2022) showed that there is a significant relationship between perceived stress, tolerance of helplessness, and stubbornness with the quality of life of the elderly in Ilam.

Considering that mothers with autistic children face many problems and challenges that put their psychological health at risk, and many of these problems cannot be solved in the short term, and the environment of these people cannot be attributed to the existence of factors Trauma fully controlled, so it seems the most accessible way to help reduce the pressures of having an autistic child is to try to promote the mental health of mothers and empower them (Shahriarimanesh & Ghasemzadeh Yazdi, 2022).

However, studies have been conducted on the quality of life of parents of children with disabilities such as cerebral palsy, intellectual disability, Down syndrome, and developmental delay. No study was found to examine the quality of life of autism parents with the aforementioned variables; Therefore, by determining the relative contribution of each of the health-promoting lifestyle structures through the mediation of helplessness tolerance in the quality of life, an important step can be taken in maintaining and improving the quality of life of the mothers of these children. Based on this, the current research was conducted with the aim of examining the pattern of structural relationships of quality of life based on health-promoting lifestyle with the mediation of helplessness tolerance in mothers with children with autism spectrum disorder in the form of the following conceptual model.

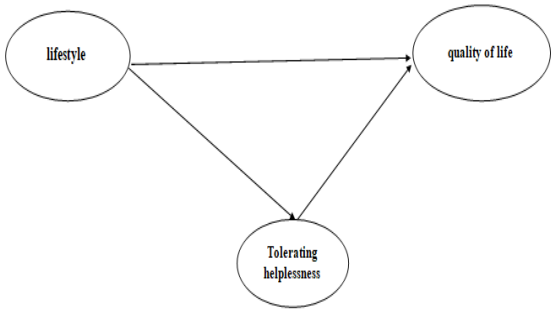

Figure 1. conceptual model of research

2. Materials and Methods

The intended research was applied in terms of purpose and in the category of correlational research through the modeling of structural equations. The statistical population was all mothers of children with autism in Bushehr who enrolled their children in exceptional schools and also had a case in the Bushehr Autism Association in 2023. In this research, 200 people were selected from among all the mothers with autistic children in Bushehr using an available sampling method. Although there is no general agreement about the sample size required for factor analysis and structural models, many researchers think that the minimum sample size is 200 (Kline, 2023). Taking into account the possibility of dropout of the subjects, 220 of these people were selected from the above statistical population using the available sampling method, and after removing the distorted data, 200 questionnaires were entered into the statistical analysis. The inclusion criteria include selecting the sample as available, being literate, and the exclusion criteria include unwillingness to participate in the research.

The method of data collection in this research was that first, after obtaining the necessary permits to carry out this research, the researcher was introduced to the exceptional centers, then the necessary arrangements were made for the researcher's presence in the desired centers, and finally, All the files of the clients of those centers were available and they were asked individually and at the center to answer the questionnaires of quality of life, health-promoting lifestyle and tolerance of helplessness in order to comply with ethical considerationsInformed consent was obtained from the participants, and a complete explanation of the purpose and method of the research was provided to them, ensuring that their information would remain confidential. Finally, the collected data were analyzed.

The data collected in this research were analyzed using SPSS version 25 software and smart PLS version 3 software, descriptive statistics methods (mean and standard deviation), and structural equation modeling.

Quality of life: This questionnaire was created in 1996 by the World Health Organization in order to create an international and culture-independent tool to assess people's quality of life. The quality of life questionnaire consists of 26 questions, the first 2 questions are general and are related to life satisfaction with health and quality of life in general, and the remaining 24 questions are the four domains of physical health (17, 18, 16,15,10,4,3), mental health (26,19,11,7,6,5), social relations (22,21,20) and environmental health (25,24,23,14,13, 12,9,8) (Lucas-Carasso, 2012). This questionnaire has 5 options whose scoring is between 1 and 5. The answers are not at all, very little, moderately, a lot, and very much, which are scored as 1 at all and 5 as very much. It should be noted that questions 4, 3, and 26 are graded in reverse, and the lowest and highest marks in this questionnaire are 24 and 120, respectively. This questionnaire has been standardized in Iran by Nejat et al (2006). Nejat et al. (2006) reported the content and diagnostic validity of this questionnaire as favorable, and its reliability using the test-retest method for physical areas, mental health, social relations, and environmental health, respectively, 0.77 and 77. 0, 0.75, and 0.84 have been obtained, and the internal correlation of its different areas using Cronbach's alpha for healthy people and patients with multiple sclerosis (MS) is considered suitable for measuring the quality of life of these people. In the present study, reliability was calculated using the internal consistency method by calculating Cronbach's alpha coefficient of 0.89.

Disturbance tolerance scale: This scale is a self-measurement index of emotional disturbance tolerance that was created by Simons & Gaher (2005) in order to measure the amount of disturbance tolerance. This scale has 16 questions. Its scoring method is based on a 5-point Likert scale, in which the number 1 is given to the item I strongly agree and the number 5 to the item I strongly disagree, which is reversed in question 7. In this scale, the maximum score is 80, and the minimum score is 16. The components of this scale include: tolerance (items 1, 3, and 5), evaluation (items 7, 8, 10, 11, 12, and 13), assimilation (items no. 2, 4, and 16), and adjustment (items no. y, 9, 14, and 15). The items of this scale are disturbance tolerance based on a person's ability to tolerate emotional disturbance, mental evaluation of disturbance, amount of attention to negative emotions when they occur, and regulatory measures to alleviate disturbance. High scores in this scale indicate high disturbance tolerance. Alpha coefficients for these subscales are 0.72 and 0.82, respectively. 0.78, 0.70, and 0.82 were obtained for the whole scale. Intraclass correlation after six months was 0.61. Also, it has been determined that this scale has a good initial convergent and criterion validity. This scale has a positive relationship with the acceptance of creation and a negative relationship with the scales of coping strategies for using alcohol and marijuana, as well as using them for recovery (Simons et al., 2005). In the present study, reliability was calculated using the internal consistency method by calculating Cronbach's alpha coefficient of 0.90.

Health promoting lifestyle questionnaire: The Health-Promoting Lifestyle Questionnaire was first designed by Walker et al. (1987) and contains 52 questions that include 6 dimensions of self-actualization, responsibility for health, interpersonal relationships, stress management, exercise and physical activity, nutrition, with 8 or 9 measuring questions. Each question has 4 answer options on the Likert scale: never, sometimes, most of the time, and always. The minimum score in this questionnaire is 52, and the maximum score is 208; high scores indicate a lifestyle

that promotes better health. The validity and reliability of this questionnaire in Iran were investigated by Mohammadi Zaidi et al. (2011), and Cronbach's alpha for self-actualization was 0.64, responsibility in health was 0.86, interpersonal relationships was 0.75, stress management was 0.91, exercise was 0.79, nutrition was 0.81, and for the whole questionnaire, 0.82 was obtained. In the present study, reliability was calculated using the internal consistency method by calculating Cronbach's alpha coefficient of 0.88.

3. Results

200 mother participants with an average age of 36.01 and a standard deviation of 6.34 participated in this research. The results of Table 1 show the mean and standard deviation of the variables of quality of life, tolerance of helplessness, and health-promoting lifestyle, and their components.

Table 1. Mean and standard deviation of subjects' scores in quality of life, tolerance of helplessness, and health-promoting lifestyle

	Variables	Mean	Standard deviation
Quality of life	Quality of life (total score)	14/85	92/6
	physical health	25/31	91/2
	mental health	63/26	12/3
	Psychosocial	74/16	03/3
	environmental health	11/99	99/3
Tolerating helplessness	Helplessness tolerance (total score)	75/36	43/13
	tolerance	44/6	28/3
	Evaluation	06/14	18/5
	attraction	85/6	71/2
	setting	25/16	04/6
A health-promoting lifestyle	A health-promoting lifestyle (total score)	96/160	66/16
	self-fulfillment	52/28	93/3
	Responsibility for health	24/32	59/3
	Interpersonal relations	25/36	72/3
	Stress management	24/35	64/3
	Exercise and physical activity	79/33	36/4
	feeding	60/24	89/3

Table 2. Cronbach's alpha, composite reliability, averageExtracted variance, and divergent validity

Research structure	Cronbach's alpha	composite reliability (CR)	Mean variance extracted (AVE)	narrativeDivergent
quality of life	0.78	0.78	0.52	0.721
lifestyleYHealth promoter	0.75	0.76	0.51	0.714
helpless toleranceY	0.89	0.89	0.67	0.818

The results obtained in Table No. 2 show that all Cronbach's alpha values and the combined reliability of the research constructs are greater than 0.7. Also, the value of AVE for the constructs is greater than 0.5, which shows that the reliability and convergent validity of the research model are acceptable. The results of divergent validity show that the mean square root of the variance extracted for each of the constructs is higher compared to the correlation of that construct with other constructs. Therefore, it can be said that, in the research model, the current variables interact more with their own questions than with other constructs. To put it better, this table demonstrates the model's divergent validity, indicating that it has favorable validity. According to Table 3, the value of R Square for the quality of life structure is 0.27, and the helplessness tolerance structure is 0.23, which indicates a suitable value.

Table 3. Structural model fit indices

Structure	AmountR Square
Quality of life	0.27
Tolerating helplessness	0.23

Table 4. Effect size index values (f2)

Variables	quality of life	Tolerating helplessness
A health-promoting lifestyle	0.16	0.30
Tolerating helplessness	0.15	-

Also, the values in Table 4 show the appropriate effect size for health-promoting lifestyle constructs and tolerating helplessness.

Overall model fit: The GOF criterion is used to assess the overall fit of the model, which controls both the measurement and the structural models. Three values of 0.01, 0.25, and 0.36 have been introduced as weak, medium, and strong values for Gof. This index can be calculated using the geometric mean of the R2 index and the average of the common value indices.

GOF = √average (Commonality) × average (R^2)
GOF =√average0/87*0/50= 0/44
As a result, the criterion value of GOF is equal to 0.44, which, by comparing it with the acceptable values for GOF, shows the overall good fit of the model.

After confirming the validity and reliability, the structural model of the research is evaluated. Structural equations have been used to test the conceptual model and research hypotheses. Figure 2 shows the output model of smart pls software.

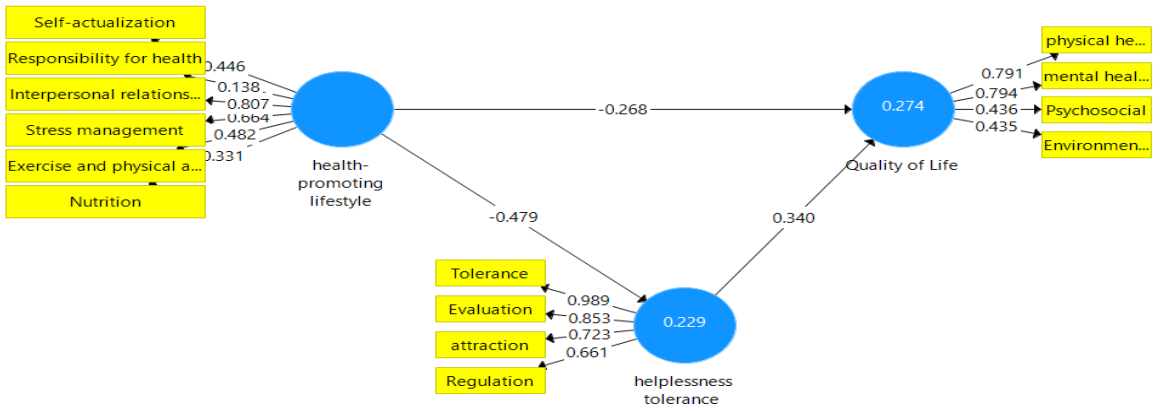

Figure 2. Measurement model coefficients

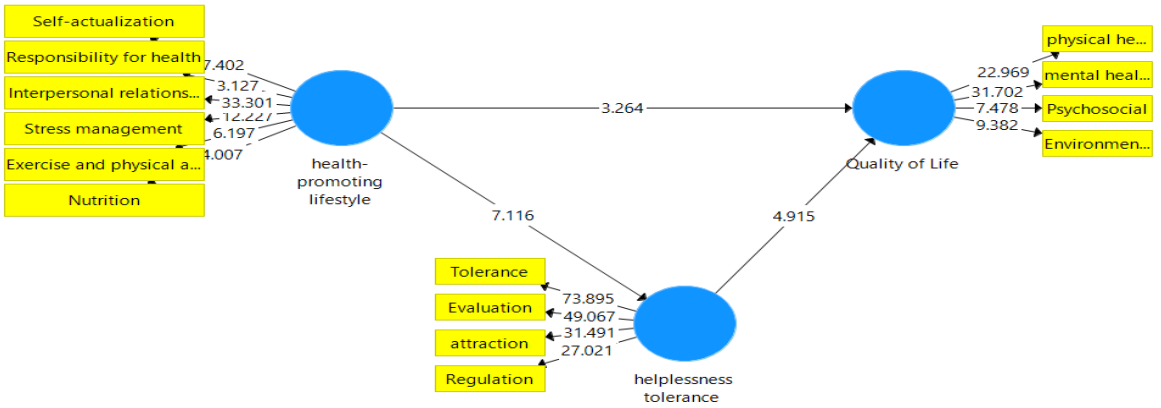

Figure 3. amountT Measurement model

Table 5. Analysis of the path of direct and indirect effects between the main research variables

path	Hypothesis	Path coefficient	amountt	the result
1	A health-promoting lifestyle on the quality of life	0.237	097/3	confirmation
2	A health-promoting lifestyle On enduring helplessness	0.481	513/7	confirmation
3	Tolerance of helplessness on the quality of life	0.372	329/5	confirmation
4	A health-promoting lifestyle –Tolerance of helplessness - quality of life	0.18	446/4	confirmation

The results of Table 5 show that the health-promoting lifestyle ($p<0.005$; $\beta=0.24$), has a direct and positive effect on the quality of life and a direct and positive effect on the tolerance of helplessness ($p<0.005$; $\beta=0.48$) has Also, the health-promoting lifestyle ($p<0.005$; $\beta=0.18$) has a significant effect on the quality of life through the mediation of helplessness tolerance.

4. Discussion and conclusion

The present study was conducted with the aim of examining the pattern of structural relationships of quality of life based on health-promoting lifestyle with the mediation of helplessness tolerance in mothers with children with autism spectrum disorder.

The results of the structural equation model showed that the health-promoting lifestyle has a direct relationship with the quality of life of mothers with autistic children. This finding is consistent with the research results of Bhopti et al. (2019), Gilson et al. (2018), Popov et al. (2021), and Nagase et al (2024).

Mothers devote a significant portion of their time and energy to activities related to caring for and coordinating their children's participation in daily life, and as a result, they have limited opportunities to engage in health-promoting activities for themselves (Bourke-Taylor et al., 2021). Caregiving mothers consistently report spending less time on physical activity, relaxation, self-care, sleep, and access to health care. Caregiving mothers often report higher levels of psychological distress (Gilson et al., 2018) and depression and anxiety (Marquis& McGrail Hayes, 2020).

The lives of mothers who have a child with autism experience unique needs and challenges that require maintaining and strengthening their mental and physical health. The lifestyle of these mothers can be severely affected by stress, anxiety, fatigue, and limited recreational and social opportunities. For example, mothers' ability to manage stress and anxiety, have an optimal and healthy life process, and pay attention to personal motivations and goals can significantly improve the quality of life for them and their children. Also, creating a positive and dynamic environment in the family, strengthening interpersonal communication, and providing effective social support can improve the health and quality of life of mothers with autistic children (Seyedesmaili Ghomi & Salmani, 2025). Therefore, a health-promoting lifestyle not only helps to improve the lives of these mothers but is also considered an important foundation for improving and developing the health and quality of life of the family in general.

The results of the structural equation model showed that the health-promoting lifestyle is directly related to the quality of life of mothers with autistic children through the mediation of disturbance tolerance. This finding is in line with the research results of Lass et al. (2020), McDonald et al. (2022), and Husseini et al. (2022). Mothers who are faced with special challenges and responsibilities of autistic children have many regional life needs that require the skills to tolerate chaos and deal with stress and pressure caused by their special situation. The ability to tolerate chaos and manage stress in the face of social, psychological, and physical challenges associated with having an autistic child can positively affect their quality of life. On the other hand, tolerating chaos and accepting the realities of life helps mothers improve their stress levels, manage anxiety, and strengthen their mental and emotional tolerance (Mikaeili et al., 2025). These vital skills increase the ability to deal with and respond appropriately to unfortunate situations and problems that occur, which ultimately leads to the improvement of the quality of life, increasing the sense of satisfaction, and improving the mental and physical health of mothers. Therefore, the ability to tolerate disturbance and manage stress can be considered as an effective mediator to improve the quality of life and improve the health of mothers with autistic children.

The present study had several limitations. First, the use of a cross-sectional design does not allow us to determine the causality of the indirect effect on the relationship between health-promoting lifestyle and quality of life. Prospective longitudinal research is needed to better understand the impact of health-promoting behaviors on quality of life in a variety of vulnerable populations. The findings of this study are limited to caregivers of mothers with autistic children, and therefore, further study is needed for other family caregivers, such as fathers or grandmothers, who have a caring role. Additionally, to further generalize the study findings, it is necessary to examine the research constructs among other vulnerable populations and in caregivers of typically developing children. Regardless of these limitations, this study provides new insight into the role of health-promoting lifestyle behaviors in relation to quality of life using multiple mediation analysis approaches.

Mothers of children with autism may face many challenges when caring for their children. Providing information and health promotion behavior programs for such mothers, which are appropriate to their life context, is one of the strategies that may help mothers to adapt to their problems, lead a healthier lifestyle, and experience less parenting stress. According to the findings of our study, urgent efforts are needed to increase health-promoting behaviors among mothers of children with autism in order to improve their health and quality of life. The results of this study also show that health professionals who work with parents of children with autism should evaluate the lifestyle of these parents and its impact on the health of mothers. In addition, the findings may be useful in developing health promotion intervention programs, such as proper lifestyle management training, to increase and improve the quality of life. In this way, the findings of this study can provide evidence for the development of appropriate intervention programs to increase the quality of life among mothers of children with autism through specific health-promoting behaviors.

5. Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed about the purpose of the research and its implementation stages. They were also assured about the confidentiality of their information and were free to leave the study whenever they wished, and if desired, the research results would be available to them.

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Authors' contributions

All authors have participated in the design, implementation, and writing of all sections of the present study.

Conflicts of interest

The authors declared no conflict of interest.

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