



Effect of Psychological Counseling Based on Problem Management Plus on Social Anxiety in Parents of Children with Autism Spectrum Disorder

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Abstract

Background: Autism spectrum disorder (ASD) is a widespread mental growth disorder. Children with ASD are unlikely to restore the ability of living independent, which definitely brings their parents greater psychological pressure and psychological problems such as social anxiety. Therefore, it is pressing to conduct intervention research on social anxiety and other problems in parents of children with ASD.

Methods: In 2022, Seventy-three parents of children with ASD were enrolled from Beijing Tongkangyuan Children's Rehabilitation Institute. They were randomly divided into the experiment group (N=36) and the control group (N=37). The experiment group was intervened with psychological counseling based on problem management plus in combination with Tai Chi. The control group did not receive any psychological intervention. Social Anxiety Scale for Children, Parenting Stress Index-Short Form and Social Support Rate Scale were used for measurement before and after the intervention.

Results: The experiment group had significantly higher decreases than the control group in the total score in social anxiety and the scores in its two dimensions after intervention ($P=0.001$). The experiment group had significant decreases in the total score in parenting stress and the scores in parenting distress and dysfunctional parent-child interaction ($P=0.001$), while there was no change in the control group. The experiment group had significant improvement in social support, which was also significantly higher than that of the control group ($P=0.001$).

Conclusion: Psychological counseling based on problem management plus could effectively alleviate social anxiety and parental pressure in parents of children with ASD, improve their social support and play a significant role in enhancing their mental health.

Keywords: Problem management plus; Social anxiety; Autism; Tai Chi

Introduction

Autism spectrum disorder (ASD) is a widespread mental growth disorder occurring in early childhood, affects the development of various func-

tions in children including self-perception, emotion and language, and is often accompanied by aggression, paranoia, hyperactivity and other ab-



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normal behaviors. The incidence rate of ASD in children aged 0-14 was found to have a rising trend (1). The number of patients with ASD in China would exceed 10 million in 2022 and continue to increase at a high speed every year (2). ASD is a developmental defect originating from the nervous system. Children with ASD are mainly characterized by narrow interests, stereotypical behaviors and social and communication disorders (2).

Up to now, there is still no effective therapy in the medical field to treat this disease. Behavioral intervention and functional rehabilitation are the only ways to relieve effectively the symptoms of children with ASD (3). On the one hand, such intervention and rehabilitation require high treatment costs, undoubtedly imposing a heavy economic burden on families of children with ASD. On the other hand, the demand for spiritual support from parents also adds more psychological stress to parents of children with ASD (4). Parents of children with ASD suffer for a long time from low mental health, high-perceived stress and poor sense of happiness (5). The multiple stresses brought by children with ASD not only increase psychological distress in parents of children with ASD, but also affect their interpersonal and social relationships. Most parents of children with ASD are not willing to participate in social activities frequently (6). Surrounding people, such as relatives or friends, often keep a distant relationship with families of children with ASD, and do not provide necessary help and support (7). This situation in turn aggravates the social avoidance and withdrawal of parents of children with ASD. Guan et al. (8) investigated 474 parents of children with ASD and observed that parents of children with ASD have a high level of perceived discrimination and poor quality of interpersonal relations. These findings indicate that it is necessary to pay attention to the problem of social anxiety in parents of children with ASD and formulate corresponding interventions to prevent and alleviate their social anxiety.

PM+ (Problem Management Plus) is a short-term and cross-diagnostic psychological intervention method proposed by the WHO (9) according to

Cognitive Behavioral Therapy (CBT) and Interpersonal Psychotherapy (IPT). With the focus on emotions (depression, anxiety, post-traumatic stress and general stress) and practical problems, this intervention method targets people affected by various negative experiences. PM+ intervention could effectively relieve the symptoms of psychological stress caused by earthquake disasters (10). At the same time, the application of PM+ intervention technology could effectively alleviate psychological pain in Pakistani residents caused by the war and improve their social functions (11). As for clinical application, some researchers adopted PM+ intervention technology to a controlled study of 80 patients with multiple myeloma, and found that PM+ could help them manage problems, reduce their symptoms of anxiety and depression, and enhance their social support (12).

It has been verified in some studies using Profile of Mood States (POMS) that long-term Tai Chi exercise could effectively reduce anxiety in the group of middle-aged and elderly people (13). However, there are targeted studies on its contribution to the physical and mental health of parents of children with ASD (14).

We aimed to address and alleviate social anxiety in parents of children with ASD, meet their basic psychological need for belonging, make innovation in the content of PM+ through organically combining it with Tai Chi exercise, and investigate the effect of this integrated intervention on social anxiety in parents of children with ASD.

Methods

First, the convenience sampling method was followed to recruit parents of children with ASD from Beijing Tongkangyuan Children's Rehabilitation Institute in Beijing City, China. Eventually, 73 parents of children with ASD willing to participate in the intervention study voluntarily were enrolled.

Inclusion criteria: 1) parents of children with ASD diagnosed by the hospital; 2) those without serious respiratory diseases, cardiovascular and

cerebrovascular diseases, limb dysfunction, etc.; 3) those without the habit of physical exercise; and 4) those who volunteered to participate in this experiment. Exclusion criteria: 1) those who did not practice Tai Chi according to the teaching requirements; 2) those who participated in less than 90% of the training course; and 3) those who quitted midway. The basic information of the participants included in this study is shown in Table 1 (statistics of basic demographic information).

The participants were informed of the intervention methods and precautions of this study at the time of recruitment. Each participant took part in this study voluntarily. This study completely meets the standards of the Ethics Committee (No. 202110063).

Research tools

Social Anxiety Scale for Children (SASC)

SASC revised by Li et al. (15) was used. This scale is applicable to adolescents aged 7-16 and includes items like "I'm afraid of doing things I haven't done before in front of other students". There are 10 items in the scale, which are scored within 3 points, ranging from 0 (never) to 2 (always). The average score is used as an indicator to measure the degree of social anxiety. A higher score means more serious social anxiety. The Cronbach α coefficient of SASC is 0.76, and its retest coefficient after two weeks is 0.67.

Parenting Stress Index-Short Form (PSI-SF)

PSI-SF (16) from Parenting Stress Index-Long Form through factor analysis, includes 36 items in total. It is divided into three subscales: parenting distress, dysfunctional parent-child interaction and characteristics of children with difficulties. The subscale of parenting distress measures parents' perceived distress in their role of parenting. The subscale of dysfunctional parent-child interaction involves both parents and children, mainly used to evaluate the interaction between children and parents. The subscale of children with difficulties measures parents' perceived stress from their worry about some characteristics of their children (such as unfavorable adap-

tive behaviors, emotional problems, hyperactivity, etc.). 5-point Likert scoring is used in PSI-SF. This scale has high reliability and validity. The α coefficient of the scale is 0.80-0.91.

Social Support Rate Scale (SSRS)

SSRS was compiled by Xiao (17). It includes 10 items, which are used to measure social support in three dimensions, including adolescents' perceived objective support, subjective support, and utilization of social support. The test-retest reliability of the scale is $r=0.92$. The internal consistency coefficient of the scale is 0.89-0.94. The scale has good reliability and validity. The measurement by the scale can accurately reflect the level of individuals' social support. The scale uses 4-point scoring, and the total score is the sum of the score in each dimension. A higher score suggests that it is easier for individuals to obtain support in life.

Intervention method

The 73 participants were randomly divided into the experiment group and the control group using the table of random numbers. There were finally 36 participants in the experiment group and 37 participants in the control group. Their basic information is shown in Table 1 (Statistics of basic demographic information).

The control group participated in routine health education on ASD in the community in the form of monthly routine community health knowledge classes. They were not given any additional physical exercise and psychological assistance.

The experiment group was given PM+ psychological counseling and Tai Chi training in addition to routine health education ASD in the community. The specific procedure is as follows: 1) PM+ intervention: the course was conducted in the form of live streaming regularly 14 times in 7 weeks, 2 times each week, 40 minutes each time. The experiment group could exchange, share and discuss their understanding and experience of PM+ in the online treatment group, or ask the psychotherapist or research assistant questions about the content of PM+ intervention technology in the treatment group.

Table 1: Comparison of basic information between experiment group and control group

<i>Variable</i>		<i>Intervention groups</i>	<i>Control Group</i>	χ^2	<i>P</i>
Gender	Male	19	14	0.19	0.73
	Female	17	23		
Age (yr)	<30	13	16	1.22	0.34
	30-35	11	11		
	>35	12	11		
Monthly household income (RMB)	<3000	15	11	0.99	0.23
	3000-5000	10	15		
	>5000	11	12		
Educational level	Senior high school or below	13	10	0.78	0.34
	College or undergraduate	16	16		
	Postgraduate or above	7	12		
Working status	Unemployed	9	7	0.33	0.87
	Part-time job	17	18		
	Full-time job	10	13		

The therapist would reply to them within a fixed time. 2) Tai Chi exercise: Tai Chi exercise was given in the form of collective offline learning the first three times, and then all given online in the form of video teaching. The training was conducted twice a week, about 50 minutes each time. The training content was simplified Chinese Tai Chi. The participants in the experiment group were allowed to choose the training time according to their own schedule to ensure the intensity of their weekly training. The objective of the first stage (week 1-3 of the intervention) was to guide the experiment group to gradually accept and learn exercise training. In the first stage, simplified Tai Chi training was conducted twice a week, 30 minutes each time, covering 5 minutes of warm-up stretching exercise, 20 minutes of simplified Tai Chi and 5 minutes of relaxing exercise. In the second stage (week 4-7 of the intervention), Tai Chi training was practiced by the participants twice a week according to the video, about 50 minutes each time.

Statistical methods

Excel 2003 was used in this study for data statistics, and SPSS 21.0 (IBM Corp., Armonk, NY, USA) was used for data analysis. Specifically, in-

dependent sample *t* test was conducted on the basic information of the participants and the scores of the experiment group and the control group in each dimension before the intervention; paired sample *t* test was conducted on the scores of the two groups before and after the intervention; independent sample *t* test was conducted on the scores of the experiment group and the control group in each dimension after the intervention. The results obtained were used to analyze the influence of this intervention method on social anxiety, parenting stress and social support in parents of children with ASD, with $P < 0.05$ indicating a statistically significant difference.

Results

Statistics of basic demographic information

The demographic comparison between the control and intervention groups is shown in Table 1. No significant differences were found between the control and intervention groups.

Impact of the intervention on social anxiety

It can be seen from Table 2 that the experiment group and the control group had no significant differences in the total score in social anxiety and

the scores in social avoidance and social distress before the intervention, both at a high level. After the intervention, the experiment group had significant decreases in both the total score in

social anxiety and the scores in its two dimensions ($P = 0.001$). On the contrary, the control group had no significant decreases in the three dimensions.

Table 2: Comparison of SASC scores between experiment group and control group before and after the intervention

<i>Variable</i>		<i>Intervention groups</i>	<i>Control Group</i>	<i>t/p</i>
Total score in social anxiety	Pre-intervention	13.47±0.50	13.50±0.50	-0.24/0.81
	Post-intervention	11.11±1.72	13.57±0.50	-7.81/0.001
	t/p	7.80/0.001	-0.36/0.95	
Social avoidance	Pre-intervention	6.47±0.50	6.50±0.51	-0.23/0.81
	Post-intervention	5.30±0.88	6.57±0.52	-7.47/0.001
	t/p	6.17/0.001	-0.46/0.89	
Social distress	Pre-intervention	6.88±0.32	6.89±0.32	-0.07/0.94
	Post-intervention	5.80±1.28	6.81±0.31	-4.77/0.001
	t/p	5.19/0.001	0.72/0.21	

Impact of the intervention on parenting stress

The experiment group and the control group had no significant differences in the total score in parenting stress and the scores in all its dimensions before the intervention, both at a high level (Table 3). After the intervention, the experiment group had significant decreases in the total score

in parenting stress ($P = 0.001$) and the scores in parenting distress and dysfunctional parent-child interaction, but had no significant change in the score in characteristics of children with difficulties. The participants in the control group had no significant changes after the intervention, still at a higher level of parenting stress.

Table 3: Comparison of PSI-SF scores between the intervention and control groups before and after the intervention

<i>Variable</i>		<i>Intervention groups</i>	<i>Control Group</i>	<i>t/p</i>
Total score in parenting stress	Pre-intervention	3.97±0.13	4.00±0.11	-1.09/0.27
	Post-intervention	3.37±0.18	4.01±0.24	-18.24/0.001
	t/p	6.05/0.001	-0.07/0.95	
Parenting distress	Pre-intervention	4.04±0.25	3.98±0.21	0.97/0.34
	Post-intervention	3.07±0.22	4.01±0.39	-15.55/0.001
	t/p	9.56/0.001	0.13/0.89	
Dysfunctional parent-child interaction	Pre-intervention	3.98±0.23	4.03±0.17	-0.87/0.38
	Post-intervention	3.10±0.26	4.01±0.26	-14.77/0.001
	t/p	7.74/0.001	-0.49/0.62	
Characteristics of children with difficulties	Pre-intervention	3.88±0.16	3.99±0.27	-1.75/0.08
	Post-intervention	3.93±0.34	4.03±0.21	-1.31/0.19
	t/p	-0.87/0.42	1.30/0.21	

Impact of the intervention on social support

It can be seen from Table 4 that the experiment group and the control group had no significant differences in the total score in social support and the scores in its three dimensions before the intervention. After the intervention, the level of

social support in the experiment group was significantly higher than that before the intervention and was significantly higher than that in the control group ($P < 0.001$). The control group had no significant changes after the intervention, always at a low level.

Table 4: Comparison of SSRS scores between the intervention and control groups before and after the intervention

Variable		Intervention groups	Control Group	t/p
Total score in social support	Pre-intervention	2.53±0.37	2.58±0.38	-0.52/0.60
	Post-intervention	3.94±0.28	2.56±0.43	-16.00/0.001
	t/p	-18.29/0.001	0.25/0.80	
Objective support	Pre-intervention	2.71±0.75	2.54±0.70	0.99/0.32
	Post-intervention	3.97±0.50	2.40±0.89	9.27/0.001
	t/p	-8.69/0.001	0.81/0.42	
Subjective support	Pre-intervention	2.53±0.70	2.57±0.70	-0.25/0.79
	Post-intervention	3.92±0.54	2.57±0.72	9.04/0.001
	t/p	-9.69/0.001	-1.10/0.27	
Utilization of support	Pre-intervention	2.40±0.58	2.61±0.58	-1.54/0.12
	Post-intervention	3.93±0.39	2.66±0.59	10.64/0.01
	t/p	-12.84/0.001	-0.60/0.55	

Discussions

PM+ in combination with Tai Chi exercise can reduce the level of social anxiety in parents of children with ASD

There were no significant differences between the experiment group and the control group before the intervention in terms of the total score in social anxiety and the scores in social avoidance and social distress. They were both at a high level of social anxiety, which indicates that the parents of children with ASD had serious problems in interpersonal relationship. This result is consistent with another one (8). Nevertheless, the level of social anxiety in the participants in the experiment group was significantly lower after one-month integrated intervention of PM+ in combination with aerobic exercise. Meanwhile, there was no significant change in the control group. This indicates that the intervention method designed in this study is effective. This result is consistent with the intervention effect of online PM+ on the stress reaction of 62 ordinary

residents during the epidemic obtained by Liu et al. (18).

PM+ is a short-term intervention method designed by the WHO based on cognitive behavior therapy and interpersonal therapy (9). It has been continuously proved in subsequent studies that PM+ is effective in intervening with the mental health of different populations, including people suffering from psychological problems due to cultural differences (19). First, PM+ is committed to helping individuals solve emotional problems such as depression and anxiety (11). A number of techniques such as relaxing breathing and mindfulness used in this intervention can effectively assist parents of children with ASD to master how to timely vent and relieve the negative emotions they experience in daily life, thus reducing their social distress (20). Secondly, PM+ also focuses on helping individuals solve practical problems and allows individuals to master strategies to cope with practical problems (21). Parents of children with ASD tend to adopt negative coping strategies such as emotional coping strategies and avoidance when facing practical problems, and

they usually do not take the initiative to seek social support (22). Through intervention and training, PM+ gradually enables parents of children with children to master the coping style based on problem solving and persevere in practice to continuously enhance their competence and achieve the goal of solving problems.

PM+ in combination with Tai Chi exercise can reduce the level of parenting stress in parents of children with ASD

The parenting stress of all the participants in the intervention was heavy before the intervention, at a higher level in terms of parenting distress, dysfunctional parent-child interaction and characteristics of children with difficulties. After the intervention, the parenting stress of the participants in the control group is slightly rather than significantly higher than that before the intervention. In contrast, parenting stress in the participants in the experiment group was effectively reduced, especially in the total score and the two dimensions including parenting distress and dysfunctional parent-child interaction. This research result is consistent Sangraula et al. results (23) and the previous research results on the relationship between physical exercise and parenting stress (24).

The integrated intervention method adopted in this study could reduce parenting stress in parents of children with ASD for the following reasons. First, the intervention method of conducting PM+ in the form of group counseling brings together parents of children with ASD who are faced with the same problems, and enhances empathy and mutual understanding among group members. Parents can share all kinds of problems and emotions they undergo in the process of taking care of their children with ASD, reduce their unique negative cognition by observing others' experiences, improve their self-compassion ability (5). Second, Tai Chi allows parents of children with ASD to strengthen the positive emotions brought by psychological intervention. Physical experiences affect individuals' cognition. Physical exercise enables individuals to feel that they are controlling their bodies and gradually controlling

the external environment (25). This kind of positive experiences is constantly strengthened, thus reducing parenting distress.

PM+ in combination with Tai Chi exercise can improve the level of social support in parents of children with ASD

PM+ in combination aerobic exercise could not only effectively reduce the level of social anxiety and parenting stress in parents of children with ASD, but could also significantly improve the level of social support in parents of children with ASD. This result is consistent with another study (26). On the one hand, this intervention method improves parents' perception of existing social support. Due to the stereotypical behaviors of children with ASD and their high treatment costs, parents of children with ASD usually believe that their children and families are heterogeneous and not understood by the world. However, with the expanding scientific education on ASD in recent years, more and more people begin to have a correct understanding of ASD and gradually accept it (27). The intervention method formulated in this study allows parents to respond correctly to the views and behaviors of others, thus helping them identify social support previously ignored or misunderstood. Furthermore, group counseling can provide parents with the opportunity to communicate with other parents. The sharing of same problems and circumstances as well as successful experiences enables parents of children with ASD to perceive more social support (28). Meanwhile, Tai Chi is also a kind of collective exercise that allows people to establish an equal and friendly relationship with each other, actively adjust their mentality, eliminate their negative emotions, and increase their perceived social support.

These results highlight the importance of paying attention to the psychological status of parents of children with ASD and reveal that the combination of psychological intervention and physical exercise can improve the effect of intervention. However, due to the short intervention time of this study and the inclusion of a small number of indicators closely related to social anxiety as the

measurement indicators, there are still other indicators such as family intimacy that can be examined. In future research, the intervention time can be extended to observe the sustainability of the intervention effect and the measurement indicators can be further enriched.

Conclusion

It is necessary to pay attention to social anxiety and other problems in parents of children with ASD, who are under great psychological pressure. PM+ was combined with the relevant theory of Tai Chi in this study to design a series of intervention measures to address the psychological problems of parents of children with ASD, followed by the implementation of an intervention experiment. Their social anxiety, parenting stress and social support were measured and compared before and after the experiment. This intervention program could effectively reduce the level of social anxiety in parents of children with ASD, reduce their parenting stress, and effectively improve their social support. In the future research, continuous effort would be made to explore the intervention effect of the psychological intervention based on PM+ in combination with physical exercise on a number of mental health indicators of parents of children with ASD for wider application.

Journalism Ethics considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The authors declare that there is no conflict of interests.

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