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ARTIGOS

Effects of a Problem-Solving Skills Training for Mothers of Cystic Fibrosis Patients

Efeitos do Treino Habilidades de Resolução de Problemas com Mães de Pacientes com Fibrose Cística

Efectos del Entrenamiento Habilidades de Resolución de Problemas con Madres de Pacientes con Fibrosis Quística

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Abstract: Cystic fibrosis is usually diagnosed in early childhood, affecting primary caregivers' mental health and interaction with the child. This study evaluated the effects of a problem-solving skills training on maternal depressive symptoms and control strategies with the child (appropriate support, critical control, and overprotection) in two mothers of children with cystic fibrosis. We conducted a pilot AB single-case experimental design. In baseline and post-intervention evaluations, mothers answered the Beck Depression Inventory-II and the Semi-Structured Interview on Maternal Control. The results showed a decrease in maternal depressive symptoms in both cases. Appropriate support slightly increased, and there was a modest decrease in overprotection in one case. The problem-solving skills training reduces symptoms of depression in mothers of children with cystic fibrosis by promoting effective solutions to everyday demands with children. However, it is necessary to extend the program's strategies or duration to produce relevant effects on maternal control.

Keywords: parental control; depression; cystic fibrosis; problem-solving skills

Resumo: A fibrose cística é frequentemente diagnosticada na infância, afetando a saúde mental dos cuidadores e a interação com a criança. Este estudo avaliou os efeitos de um treinamento de habilidades de resolução de problemas na saúde mental e controle materno (suporte apropriado, controle crítico e superproteção) de duas mães de crianças com fibrose cística. Foi uma investigação piloto com delineamento experimental de caso único AB. Nas avaliações pré-intervenção e pós-intervenção, as mães responderam ao Inventário Beck de Depressão-II e à Entrevista Semiestruturada sobre Controle Materno. Os resultados revelaram redução da depressão nos dois casos. Houve pequeno aumento do suporte apropriado e modesta redução da superproteção em um caso. O treinamento em resolução de problemas reduziu a depressão em mães de crianças com fibrose cística, promovendo soluções efetivas para demandas cotidianas com crianças. Entretanto, é necessário estender as estratégias ou a duração do programa para produzir efeitos relevantes no controle materno.

Palavras-chave: controle parental; depressão; fibrose cística; habilidades de resolução de problemas

Resumen: Este estudio evaluó los efectos de un entrenamiento en habilidades de resolución de problemas sobre la salud mental y el control materno (apoyo adecuado, control crítico y sobreprotección) en dos madres de niños con fibrosis quística. Se trata de un diseño experimental de caso único AB piloto. En las evaluaciones inicial y posterior a la intervención, las madres respondieron al Inventario de Depresión de Beck-II y a la Entrevista Semiestructurada sobre Control Materno. Los resultados revelaron una reducción de la depresión en ambos casos. El apoyo adecuado aumentó ligeramente, y hubo una modesta reducción de la sobreprotección en un caso. El entrenamiento de resolución de problemas reduce los síntomas de depresión en las madres de niños con

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fibrosis quística al promover soluciones efectivas a las demandas cotidianas con los niños. Sin embargo, es necesario ampliar las estrategias o la duración del programa para producir efectos relevantes en el control materno.
Palabras clave: control parental; depresión; fibrosis quística; habilidades de resolución de problemas.

Cystic fibrosis is a chronic, potentially lethal genetic disease that is most common among Whites, affecting also Black and Latin American children. Because it is a progressive disease that compromises the functioning of respiratory, gastrointestinal, hepatic, and genitourinary systems, it often requires complex treatments (Sanders & Fink, 2016). Carrying out daily care to control the disease's progression is a challenge for patients and, especially, for caregivers.

Mothers of children with cystic fibrosis tend to have a higher prevalence of symptoms of anxiety, depression, and stress than the general population (Cronly et al., 2019; Vardar-Yagli et al., 2017), even when compared to fathers or other male caregivers (Cronly et al., 2019; Grossoehme et al., 2015). Depression stands out as the most severe mental health impairment for parents of patients with cystic fibrosis and is related to children's and adolescents' physical and mental health (Cronly et al., 2019; Grossoehme et al., 2015). Children whose parents exhibit more symptoms of depression and anxiety tend to manifest more respiratory problems, worse lung function, and greater impairments in life quality, than those whose parents do not express emotional impairment (Cronly et al., 2019).

Symptoms of depression can compromise the mother–child relationship's quality and the maternal practices used to regulate child behavior (Sheehan et al., 2014; Yuksekgonul et al., 2020). Severe or overprotective parenting practices, for example, are related to developmental impairments in children with chronic illnesses (Sheehan et al., 2014). Additionally, conflicts caused by ineffective practices can increase parental stress, exacerbating mental health problems in parents (January et al., 2019). The theoretical model of parental control (Barber, 1996) allows for the investigation of the characteristics of three dimensions of parental behavior: appropriate support, critical control, and overprotection. The appropriate support dimension includes parental behaviors that aim to modify the child's behavior through assertive communication, including explanations about social rules and the consequences of children's behaviors. Such behaviors prioritize encouraging children's autonomy and ensuring their physical and emotional security to explore the environment and expand their behavioral repertoire. Critical control encompasses parental rejection and criticism, which insult or ridicule children's behaviors and characteristics. Overprotection involves excessive or unnecessary protection that restricts the child's autonomy and does not stimulate new experiences and the expansion of the child's repertoire (Barber, 1996; McShane & Hastings, 2009).

Parents of children with chronic illnesses tend to be more controlling, exhibit higher levels of overprotectiveness, and show less positive affection (i.e., emotional warmth) toward their children than parents of children without chronic illnesses (Pinquart, 2013). A study with mothers of Brazilian children with cystic fibrosis revealed that mothers tend to use higher levels of overprotection and critical control in contexts that do not involve the direct treatment of the disease, such as tantrums, difficulty in sleeping, or interactions with peers (Paixão et al., 2021). Such behaviors may be the result of a shortage of physical, cognitive, and emotional resources. Compared to mothers of children without chronic diseases, mothers of children with cystic fibrosis tend to have lower education levels, many are unemployed, and their families have lower incomes (Douglas et al., 2016). These are important predictors of mental health impairment in mothers of children with chronic illnesses that also affect the quality of maternal control strategies (Sheehan et al., 2014).

Interventions focused on problem-solving skills training are effective in promoting mental health and adaptive behaviors of parents of children with chronic illnesses (Eccleston et al., 2015; Law et al., 2016; Sahler et al., 2013; Young et al., 2020). The problem-solving approach aims to improve the availability of different response

alternatives to deal with a problematic situation and increase the probability of choosing the most effective response among the various alternatives (D'Zurilla & Goldfried, 1971). Improvements in parental problem-solving skills may reduce avoidable disease-related complications (e.g., symptoms due to treatment nonadherence), decreasing parents' psychological distress and improving their overall quality of life (Barakat et al., 2014; Sahler et al., 2005). Furthermore, these benefits tend to be maintained over time (Eccleston et al., 2015; Young et al., 2020).

During a problem-solving training intervention, mothers are encouraged to reflect on the most effective solution to everyday problems, evaluating the consequences of the available alternatives for themselves and others involved (D'Zurilla & Goldfried, 1971). Therefore, after this type of training, problem-solving strategies to regulate children's behavior may increase mothers' use of appropriate support because of these control strategies' positive consequences. Conversely, problem-solving strategies may reduce critical control and overprotection because those behaviors produce aversive consequences. Thus, after the Bright IDEAS intervention, mothers of children with cystic fibrosis show improvements in mental health and parental control.

Bright IDEAS is an evidence-based behavioral intervention grounded in the problem-solving approach. It was originally designed to support caregivers of children recently diagnosed with cancer (Sahler et al., 2005, 2017), but it was also applied to other chronic conditions such as sickle cell disease, autism, and chronic pain or in inpatient rehabilitation after trauma (Eccleston et al., 2015; Palermo et al., 2016; Young et al., 2020). This intervention model assumes that improvements in problem-solving skills tend to mediate the relation between treatment-related demands and parental distress and behavior (Barakat et al., 2014; Sahler et al., 2005). The program could be effective for caregivers of children with different chronic diseases because they share similar challenges in emotional adjustment (Sahler et al., 2005, 2017).

The purpose of the current study was to adapt the Bright IDEAS intervention for mothers of children with cystic fibrosis and to evaluate its effects on mental health and maternal control strategies. The study adopted a pilot AB single-case experimental design (Anderson & Kim, 2003), a recommended alternative for investigating an intervention's effects through an idiographic perspective. We tested two hypotheses: (a) mothers will show improvement in depression symptoms from baseline to post-intervention assessment, and (b) the frequency of appropriate support will increase while the frequencies of critical control and overprotection will decrease from baseline to post-intervention.

Method

Participants

Two mothers of children diagnosed with cystic fibrosis participated in this study, selected by convenience in a public outpatient clinic. Mothers were eligible to participate in this study if their child (a) received the diagnosis of cystic fibrosis at least three months before the study's beginning, (b) were under outpatient medical treatment or follow-up for cystic fibrosis, (c) were in stable clinical condition at the recruitment period, and (d) were between 6 and 11 years of age because, during this period, social interactions become more challenging. The two mothers participated in a broader study that evaluated parenting control strategies in different life contexts of children with cystic fibrosis. They were selected for the current study because both reported difficulties regulating their children's behavior. The first two mothers were invited to participate in the study accepted the invitation and were selected.

Information from the participating mothers and their children will be referred to throughout the study as Case 1 and Case 2. The mother in Case 1 was 23 years old, had incomplete elementary school education, and did not work outside the home. She had two children, one of whom was diagnosed with cystic fibrosis at the age of 2. This mother lived with the children's father and had a family income equivalent to one minimum wage.

According to the information provided by the mother and the health care team, the child in Case 1 had lung disease secondary to cystic fibrosis, pancreatic insufficiency, and severe malnutrition. In addition to medications administered orally, the child also received respiratory physiotherapy. Even under treatment, his clinical condition was severe (i.e., the child had impaired physical and socioemotional well-being). According to the mother, the child interacted well with peers but often presented with severe stomach pains that prevented him from playing and going to school. She also reported that the child presented cognitive difficulties and lower school performance than his classmates, which made him suffer and often refuse to go to school.

The mother in Case 2 was 26 years old and had completed high school. She did not work outside the home, did not live with her son's father, and maintained a family income of less than one minimum wage. Her only child was diagnosed with cystic fibrosis at the age of 5. The mother and the health care team reported that the child presented with malnutrition, which motivated pulmonary medical care. The child had no secondary pulmonary disease or pancreatic insufficiency, and at the time of the study, there was no longer any malnutrition. Treatment consisted of oral medications and enzyme replacement, but the latter had been discontinued. His mother reported no physical or socioemotional harm related to the disease.

Procedures

This study was registered and approved by the National Commission for Research Ethics (CEP-CONEP/Brazil – process number: 2.553.871). While awaiting routine medical appointments, the participants were interviewed individually and provided informed consent. In this baseline assessment, participants provided sociodemographic information about the family and clinical information about the child, answered the Beck Depression Inventory-II (BDI-II), and completed the Interview on Maternal Control Practices. Medical records and the health care team complemented children's clinical information provided by the mothers.

Approximately 2 months after the baseline assessment, the intervention began, lasting six sessions, one each week. The intervention was implemented individually in the same multidisciplinary outpatient clinic where the child was undergoing cystic fibrosis treatment. All sessions were audio-recorded. The necessary financial resources for travel to each of the sessions were guaranteed, and the schedules were flexible according to the participants' demands to avoid dropout. Two months after the intervention, the post-intervention evaluation was carried out with the same instruments used at baseline. The interviews were audio-recorded and later transcribed. An undergraduate psychology student who received intensive training (10 hours) carried out recruitment, baseline, and post-intervention assessments. The first author of this study implemented the intervention.

Bright IDEAS problem-solving skills training

The manual and permission to use the Bright IDEAS program were obtained from the developers (Sahler et al., 2017), who provided us with the files that had not yet been formally published at the time but are now available as supplementary material in recent studies (Young et al., 2020). Bright IDEAS aims to provide multiple opportunities for practice and reinforcement of problem-solving skills in everyday life and reflection on the degree of success achieved. Bright refers to the concept of optimism, essential for successful problem-solving. The acronym IDEAS is a mnemonic that refers to the five steps of the problem-solving process. We made small adjustments in the intervention to address specific needs of mothers of children with cystic fibrosis. The presentation layout of the IDEAS acronym was also adapted to ensure adequacy to the Portuguese language and its implementation in public health services.

The five steps of the problem-solving process were illustrated with the image of a hand in which the finger represented keywords referring to each of the five steps of problem-solving: (a) identify

the problem; (b) produce an exhaustive list of all available options for the solution, from the easiest to the most complex; (c) reflect on the listed options and choose the best one; (d) put the chosen option into practice; and (e) evaluate whether the achieved results were sufficient. These five steps were applied to three child-related problems chosen by each mother. The complete program involved six individual sessions, each lasting 1 hour. At the end of each session, the mothers received an extra activity that included reflections on problem-solving alternatives and the implementation of the chosen action to deal with the session's target problem.

Measures

Participants' Characterization

To characterize the participants and their children, a Sociodemographic Information Form and a Child Clinical Information Form were used. In the first form, mothers answered sociodemographic questions about the family (e.g., education and income). The second was filled in with the mother's reports about the symptoms and routine care of the disease and supplemented with technical information from the health care team about the diagnosis and treatment of the child.

Mental Health

The Beck Depression Inventory-II (BDI-II) (Beck et al., 1996) was used to assess maternal mental health. This instrument is a symptomatic self-report scale that aims to measure the intensity of different levels of depression symptoms in individuals aged 13 years and older. It consists of 21 items (e.g., "My appetite is much smaller than usual" or "I get irritable all the time") with four different response choices each on how the individual has felt during the past 2 weeks. The sum of the individual item scores provides a dimensional score of the intensity of depression symptoms, which can be classified into four levels: nonclinical (up to 13 points), mild (between 14 and 19 points), moderate (between 20 and 28 points), and severe (29 points and above). Thus, the higher the score, the more relevant the symptoms of depression. For this study, we used the Portuguese version (Gomes-Oliveira et al., 2012), whose internal consistency (Cronbach's alpha) was 0.93.

Maternal Control Strategies

Maternal control was assessed with the Interview on Maternal Control Practices (based on the proposal by Piccinini et al., 2007). The interview includes seven challenging daily situations for parents and children with cystic fibrosis: (a) food: the child refuses to eat; (b) medicine: the child refuses to take medicines or enzymes; (c) physiotherapy: the child refuses to have respiratory physical therapy and oxygen therapy; (d) sleep situation: the child refuses to sleep at night; (e) peer interaction: the child refuses to interact with other children; (f) tantrum: the child throws a tantrum; (g) school: the child refuses to go to school. Mothers reported the strategies they used when these situations occurred or how they would react if they occurred.

A coding system for content analysis (Bardin, 1977/2016) of the interviews was developed based on self-report measures and observations by Barber (1996) and McShane and Hastings (2009). This system includes nine distinct and mutually exclusive categories, grouped into the broader dimensions of appropriate support, critical control, and overprotection. The appropriate support dimension includes four categories: (1) rule setting—information about rules and boundaries set for child behavior (e.g., "*Saying that it is an obligation to go to school; just as I have to go to work, she has to study*"); (2) reasoning—explanations about the natural consequences of the child's behavior, to self or others (e.g., "*This medicine is good for your health, so you will be strong to go to school, study, and play*"); (3) encouragement and warmth—displays of support and affection, including praise and positive comments in routine situations (e.g., "*Look at mommy, breathe, relax, it will be okay*"); (4) sensitive support—assurance of care or help needed when the child presents difficulties due to a new challenge or extreme situation (e.g., "*He lies down; I stay with him until he sleeps*"—when the child was at the hospital because of a crisis).

The critical control dimension includes four categories: (5) criticism—hostility, rejection, or humiliation toward the child (e.g., "*If you don't study, you'll look stupid*"); (6) emotional manipulation—an attempt to manipulate the child's behavior through emotional blackmail, such as inducing guilt or withdrawing love or attention. It also includes emotional invalidation (e.g., "*I do everything for you, I don't buy anything for myself, only for you, and you keep disobeying me*"); (7) physical punishment—physical interventions that cause pain to the child (e.g., "*If she had a tantrum, I think I would slap her*"); and (8) threat—verbal threats about punishing the child physically or psychologically (e.g., "*Go to sleep; otherwise you will get a spanking*"). Finally, the overprotection dimension is a single category, (9) overprotection—excessive or unnecessary parental care or assistance (e.g., "*When he cries so much because he doesn't want to go to school, then I leave him at home*").

The interviews' analysis was carried out by two independent coders (undergraduate psychology students) who received extensive training (60 hours). Reliability was established based on 10 interviews and achieved a Kappa coefficient of 0.75. For 85% accuracy in coding schemes with nine codes, kappa values of .69 indicate equable code probabilities when comparing two observers (Bakeman & Quera, 2011). After coding the interviews, frequencies were computed for the nine categories, separately, and for the three maternal control dimensions.

Data Analysis

Single case design studies involve visual analysis of the data presented graphically to show the magnitude of the changes that occurred after the intervention (Anderson & Kim, 2003). BDI-II scores and percentage frequencies of maternal control strategies were plotted and subjected to visual analysis, in which baseline and post-intervention measures were compared. The magnitude of change was examined through the increases and decreases of each variable investigated over time.

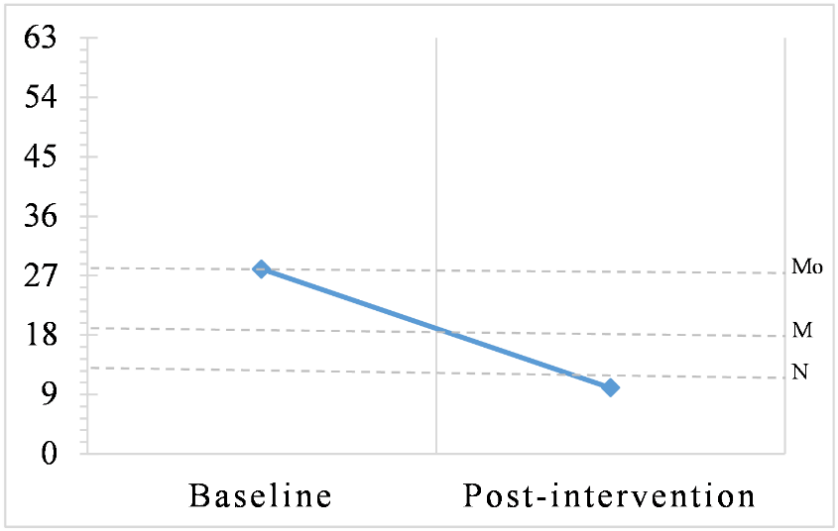
Results

Case 1

Figure 1 illustrates the comparison of the mother's mental health assessments at baseline and post-intervention. The symptoms of depression decreased, revealing that the BDI-II score went from 28 at the first assessment to 10 at the second. Thus, the classification of the intensity of depression changed from moderate to minimal.

Figure 1

Depression symptoms at baseline and post-intervention, Case 1

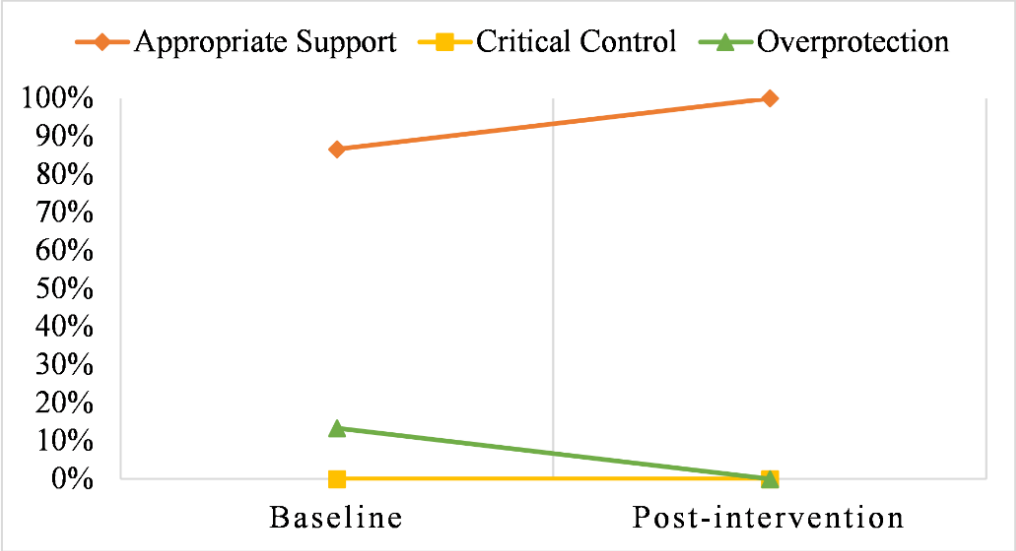


Note. Mo: moderate. M: mild. N: nonclinical.

In the first step of the analysis, the percentages of the three maternal control dimensions were compared between baseline and post-intervention. The relative frequencies (percentages) on maternal control strategies for Case 1 are displayed in Figure 2. At baseline, about 86.66% (F = 13) of the reported control strategies were appropriate support and 13.33% (F = 2) were overprotection. At post-intervention, 100% of the reported strategies were appropriate support (F = 12).

Figure 2

Percentage of Case 1 maternal control dimensions at baseline and post-intervention



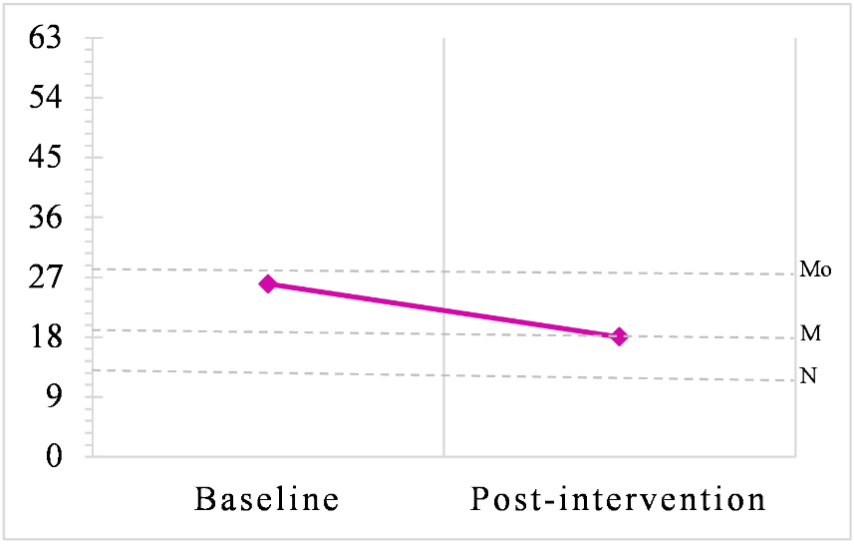
The mother in Case 1 was present in all sessions and performed all the proposed activities during the intervention sessions. As for the extra-intervention activities, on two occasions the participant forgot to bring the activity protocol to the session but reported its content in detail. The three problems chosen by the mother to be solved during the intervention were: (a) difficulty in setting limits on the child (e.g., tantrums or disobedience), (b) frequently yelling at the child or ignoring that the child was trying to get her attention, and (c) being rude and impatient with the child's difficulties in school activities.

Case 2

Figure 3 shows the comparison of the mother's mental health assessments between baseline and post-intervention. Depression symptoms decreased from baseline to post-intervention, and the BDI-II score went from 26 at the first assessment to 18 at the second. The classification of the intensity of depression changed from moderate to mild.

Figure 3

Depression symptoms at baseline and post-intervention, Case 2

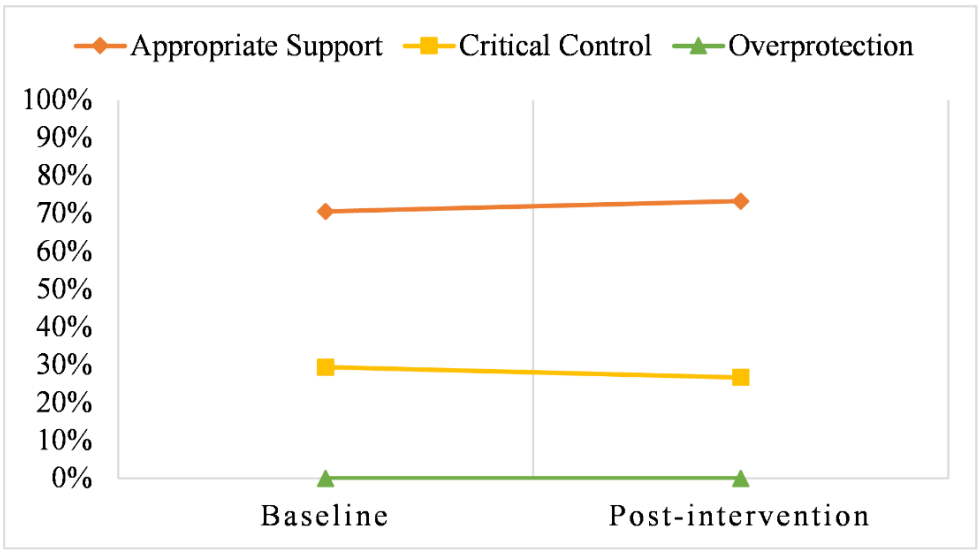


Note. Mo: moderate. M: mild. N: nonclinical.

The results of the analysis of maternal control strategies for Case 2 are displayed in Figure 4. There were no expressive changes in the relative frequencies (percentages) of the three dimensions from baseline to post-intervention. At baseline 70.58% (*F* = 12) of appropriate support strategies and 29.41% (*F* = 5) of critical control were reported. At post-intervention, the reports followed a similar trend to the first assessment; 73.33% (*F* = 11) were of appropriate support and 26.66% (*F* = 4) of critical control.

Figure 4

Percentage of Case 2 maternal control dimensions at baseline and post-intervention



The mother of Case 2 was also present in all sessions. However, the extra activities were only partially completed because the mother started working outside the home, which reduced her opportunities to interact with the child. The three problems chosen by the mother to be solved during the intervention were: (a) difficulty managing the child's refusal to obey her and the challenging behaviors the child displayed on these occasions (e.g., swearing at or offending the mother); (b) organization difficulty of the child (e.g., school supplies or toys lying around); and (c) the child's difficulty in communicating with and relating to the father.

Discussion

This study evaluated the effects of a problem-solving skills training intervention for mothers of children with cystic fibrosis on maternal mental health and control strategies. The first hypothesis tested in this study was confirmed. At baseline, both participants had moderate depression symptoms, and 2 months after the intervention, both showed a significant reduction in such symptoms. This finding supports the literature that suggests the effectiveness of interventions with the problem-solving approach in reducing depression symptoms of mothers of children with chronic health conditions (Law et al., 2016; Palermo et al., 2016; Sahler et al., 2013).

The intervention protocol sought to promote a sense of optimism and self-control. The problems reported and the emotions elicited by them, in both cases, were approached as a natural part of everyday life, and the participants were encouraged to face them proactively, evaluating the consequences of their actions and making adjustments when necessary. Predictors of depression in mothers of children with cystic fibrosis include both difficult everyday situations, such as unemployment and low family income, typical in families of children with cystic fibrosis (Douglas et al., 2016), as well as treatment conditions and the severity of the child's disease (Vardar-Yagli et al., 2017). Multidisciplinary actions are often crucial in assisting these families. While social assistance services operate to support socio-economic aspects, for example, psychological intervention can be essential in promoting the development of the behavioral repertoire necessary to deal with the various demands associated with childhood illness. Thus, the improvement in depression symptoms may have resulted from of the expansion of the repertoire of problem-solving skills and the consequent feeling of self-control that this expansion tends to produce.

Self-control is defined as the individual's management of the conditions that affect certain aspects of one's behavior to enable one's control over the environment (Skinner, 1953/1989). Throughout the intervention, the mothers performed the problem-solving process for three problem situations of their choice. The intervention allowed them to develop the ability to observe and evaluate the effects of their resolution attempts and encouraged them to do so whenever they realized they were not achieving the desired results. By the intervention's conclusion, the participants were stimulated to continue using the skills learned in other contexts.

The advances in the use of problem-solving skills and the feeling of self-control were likely driven by reinforcement contingencies that the two mothers began to experience after the training. The strengthening and pleasure effects produced by reinforcement contingencies are different mechanisms that occur at different times. The strengthening effect reflects the tendency to act in the same way and the pleasure effect refers to the positive feelings that the individual experiences when something has occurred (Skinner, 1986). By perceiving themselves as having greater control over their behaviors and more competence to effectively solve problems that previously caused them distress, mothers experienced more positive feelings. At least in part, these feelings could explain the reduction in some of the depressive symptoms. Likely, the strengthening effect of the reinforcement contingencies generated by the problem-solving training enhanced the frequency of effective responses to solving treatment and other daily

conflicts with the child, reducing distress and improving the quality of mother-child interaction.

Another significant result is the maintenance of the benefits of the intervention on mental health. In the current study, the reduction in depressive symptoms was found approximately 2 months after the intervention. This finding corroborates the literature highlighting the maintenance of mental health benefits from interventions with the problem-solving approach for mothers of children with chronic idiopathic pain (Law et al., 2016). However, in investigations with mothers of children recently diagnosed with cancer, this therapeutic effect decreased at follow-up, 3 months after the completion of the intervention, possibly because of the reduction in post-traumatic stress symptoms typical in mothers of children newly diagnosed with cancer (Sahler et al., 2005). Given these controversial findings, further studies must investigate the stability of the mental health gains for parents of children with chronic illnesses produced by interventions using the problem-solving approach. Additionally, follow-up evaluations of 6 months to 1 year could verify how stable these effects may be.

According to the second hypothesis, the frequency of use of appropriate support strategies would increase while the usage frequencies of critical control and overprotection would decrease from baseline to post-intervention. In Case 1, there was a decrease in overprotection strategies and an increase in appropriate support strategies from baseline to post-intervention. In any case, as the mother in Case 1 already predominantly presented appropriate support practices at baseline, the changes seen post-intervention were not very expressive. In Case 2, the usage frequencies of the three dimensions of maternal control were quite similar in the two assessment phases. Thus, we conclude that the intervention had no relevant effects on the quality of maternal control.

According to the theoretical model of problem-solving therapy (D'Zurilla & Goldfried, 1971), this treatment aims to increase the likelihood of behaviors that tend to produce positively reinforcing consequences and reduce behaviors that generate aversive consequences. Participants were trained to reflect on the most effective strategy for dealing with problematic situations in interactions with their children and evaluate the consequences of these strategies once implemented. We hypothesized that appropriate support would produce positive consequences while critical control and overprotection would have aversive consequences (Barber, 1996; McShane & Hastings, 2009). Further, mothers would generalize the ability to select successful strategies and evaluate them to the dimension of parental control. However, the results showed that problem-solving skills training did not prove sufficient to modify maternal control strategies.

Regarding the problems chosen by the mothers, both participants selected situations related to maternal control. However, while the mother in Case 1 formulated three problems focusing on her difficulties in controlling her child's behavior, the mother in Case 2 formulated two problems that focused predominantly on the child's behavior. According to Skinner (1974), awareness or self-knowledge is an essential dimension of the individual repertoire that predicts a greater likelihood of associated behavioral changes.

The subtle changes in Case 1 suggest that the intervention has the potential to change maternal behavior. However, it needs additional techniques or more time so that the problem-solving skills learned can be reinforced over a more extended period in the mother–child interaction and by the facilitator herself during the sessions. Therefore, future research could test extended versions of the intervention with a greater emphasis on discussing different maternal control strategies used by mothers on their children's behavior and the mother-child relationship. The five steps of problem-solving could be used to choose effective control strategies and evaluate their effects throughout the intervention.

Some limitations restrict the generalizability

of the results. Due to limited resources and time, we did not perform repeated measurements in the two evaluation phases. The lack of multiple assessments restricts the estimation of changes caused by the passage of time. However, since this was the first study to implement treatment to promote problem-solving in mothers of children with cystic fibrosis, the main objective was to evaluate the potential effects of the intervention compared to the period without intervention. Future investigations must adopt more sophisticated designs to advance knowledge about the potential of this type of intervention.

In summary, our findings suggested the benefits of problem-solving training for maternal mental health but did not reveal expressive improvements in maternal control strategies. Thus, this study confirmed the potential of this intervention to improve the mental health of mothers of children with chronic illnesses, including cystic fibrosis, but also showed the need for expansion of strategies to reduce overprotection and critical control practices and increase the frequency of appropriate support.

References

Anderson, C. M., & Kim, C. (2003). Evaluating treatment efficacy with single-case designs. In M. C. Roberts & S. Ilardi (Eds.), *Handbook of research methods in Clinical Psychology* (1st ed., pp. 73–91). https://doi.org/10.1207/s15327752jpa4605_20

Bakeman, R., & Quera, V. (2011). *Sequential analysis and observational methods for the behavioral sciences.* Cambridge University Press.

Barakat, L. P., Daniel, L. C., Smith, K., Robinson, M. R., & Patterson, C. A. (2014). Parental problem-solving abilities and the association of sickle cell disease complications with health-related quality of life for school-age children. *Journal of clinical psychology in medical settings*, *21*(1), 56–65. https://doi.org/10.1007/s10880-013-9379-7

Barber, B. K. (1996). *Parental psychological control: Revisiting a neglected construct*. *Child Development*, *67*(6), 3296-3319. https://psycnet.apa.org/doi/10.2307/1131780

Bardin, L. (2016). *Análise de conteúdo* (L. A. Reto & A. Pinheiro, Trans.). Edições 70. (Original work published 1977)

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. Psychological Corporation.

Cronly, J., Horgan, A. M., Lehane, E., Howe, B., Duff, A. J., Riekert, K. A., Perry, I. J., Fitzgerald, A. P., Chroinin, M. N., & Savage, E. (2019). Anxiety and depression in parent caregivers of children with cystic fibrosis. *Journal of Child and Family Studies*, *28*(5), 1304–1312. https://doi.org/10.1007/s10826-019-01349-0

Douglas, T., Green, J., Park, J., Turkovic, L., Massie, J., & Shields, L. (2016). Psychosocial characteristics and predictors of health-care use in families of young children with cystic fibrosis in Western Australia. *Journal of Paediatrics and Child Health*, *52*(1), 34–39. https://doi.org/10.1111/jpc.13011

D'Zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology*, *78*(1), 107–126. https://doi.org/10.1037/h0031360

Eccleston, C., Fisher, E., Law, E., Bartlett, J., & Palermo, T. M. (2015). Psychological interventions for parents of children and adolescents with chronic illness. *Cochrane Database of Systematic Reviews*, *8*(4), 1–172. https://doi.org/10.1002/14651858.CD009660.pub2

Gomes-Oliveira, M. H., Gorenstein, C., Lotufo Neto, F., Andrade, L. H., & Wang, Y. P. (2012). Validation of the Brazilian Portuguese version of the Beck Depression Inventory-II in a community sample. *Revista Brasileira de Psiquiatria*, *34*(4), 389–394. https://doi.org/10.1016/j.rbp.2012.03.005

Grossoehme, D. H., Szczesniak, R. D., Britton, L. L., Siracusa, C. M., Quittner, A. L., Chini, B. A., Dimitriou, S. M., & Seid, M. (2015). Adherence determinants in cystic fibrosis: Cluster analysis of parental psychosocial, religious, and/or spiritual factors. *Annals of the American Thoracic Society*, *12*(6), 838–846. https://doi.org/10.1513/AnnalsATS.201408-379OC

January, A. M., Kelly, E. H., Russell, H. F., Zebracki, K., & Vogel, L. C. (2019). Patterns of coping among caregivers of children with spinal cord injury: Associations with parent and child well-being. *Families, Systems & Health*, *37*(2), 150–161. https://doi.org/10.1037/fsh0000415

Law, E. F., Fales, J. L., Beals-Erickson, S. E., Failo, A., Logan, D., Randall, E., Weiss, K., Durkin, L., & Palermo, T. M. (2016). A single-arm feasibility trial of problem-solving skills training for parents of children with idiopathic chronic pain conditions receiving intensive pain rehabilitation. *Journal Of Pediatric Psychology*, *42*(4), 1–12. https://doi.org/10.1093/jpepsy/jsw087

McShane, K. E., & Hastings, P. D. (2009). The New Friends Vignettes: Measuring parental psychological control that confers risk for anxious adjustment in preschoolers. *International Journal of Behavioral Development*, *33*(6), 481–495. https://doi.org/10.1177/0165025409103874

Paixão, C., Alvarenga, P., Barros, L., & Souza, E. L. (2021). Parental control in different life contexts for paediatric cystic fibrosis patients. *Análise Psicológica*, *39*(1), 93–105. https://doi.org/10.14417/ap.1766

Palermo, T. M., Law, E. F., Bromberg, M., Fales, J., Eccleston, C., & Wilson, A. C. (2016). Problem-solving skills training for parents of children with chronic pain: A pilot randomized controlled trial. *Pain*, *157*(6), 1213–1223. https://doi.org/10.1097/j.pain.0000000000000508

Piccinini, C. A., Frizzo, G. B., Alvarenga, P., Lopes, R. de C. S., & Tudge, J. R. (2007). Práticas educativas de pais e mães de crianças aos 18 meses de idade. *Psicologia: Teoria e Pesquisa*, *24*(3), 369–377. https://doi.org/10.1590/S0102-37722007000400002

Pinquart, M. (2013). Do the parent-child relationship and parenting behaviors differ between families with a child with and without chronic illness? A meta-analysis. *Journal of Pediatric Psychology*, *38*(7), 708–721. https://doi.org/10.1093/jpepsy/jst020

Sahler, O. J. Z., Askins, M. A., Dolgin, M. J., Fairclough, D. L., Katz, E. R., Voll, M. E., Noll, R. B., & Phipps, S. (2017). *Bright IDEAS: Problem-solving skills training for everyday living* (pp. 1–26). *Instructor's Manual*.://www.healthpolicyinstitute.pitt.edu/sites/default/files/Bright%20IDEAS%20Users%20Manual%20-%20Full%20Page%209-1-17.pdf

Sahler, O. J. Z., Dolgin, M. J., Phipps, S., Fairclough, D. L., Askins, M. A., Katz, E. R., Noll, R. B., & Butler, R. W. (2013). Specificity of problem-solving skills training in mothers of children newly diagnosed with cancer: Results of a multisite randomized clinical trial. *Journal of Clinical Oncology*, *31*(10), 1329–1335. https://doi.org/10.1200/JCO.2011.39.1870

Sahler, O. J. Z., Fairclough, D. L., Phipps, S., Mulhern, R. K., Dolgin, M. J., Noll, R. B., Katz, E. R., Varni, J. W., Copeland, D. R., & Butler, R. W. (2005). Using problem-solving skills training to reduce negative affectivity in mothers of children with newly diagnosed cancer: Report of a multisite randomized trial. *Journal of Consulting and Clinical Psychology*, *73*(2), 272–283. https://doi.org/10.1037/0022-006X.73.2.272

Sanders, D. B., & Fink, A. K. (2016). Background and epidemiology. *Pediatric Clinics of North America*, *63*(4), 567–584. https://doi.org/10.1016/j.pcl.2016.04.001

Sheehan, J., Hiscock, H., John, M., Adam, J., & Hay, M. (2014). Caregiver coping, mental health and child problem behaviours in cystic fibrosis: A cross-sectional study. *International Journal of Behavioral Medicine*, *21*(2), 221–220. https://doi.org/10.1007/s12529-013-9289-y

Skinner, B. F. (1986). What is wrong with daily life in the Western World? *American Psychologist*, *41*(5), 568–574.

Skinner, B. F. (1989). *Ciência e comportamento humano* (T. J. C. Torodov & R. Azzi, Trans., 7th ed.). Martins Fontes. (Original work published 1953)

Skinner, B. F. (1974). *Sobre o behaviorismo* (T. M. P. Villalobos, Trans., 10th ed.). Cultrix.

Vardar-Yagli, N., Saglam, M., Inal-Ince, D., Calik-Kutukcu, E., Arikan, H., Savci, S., Ozcelik, U., & Kiper, N. (2017). Hospitalization of Children with Cystic Fibrosis Adversely Affects Mothers' Physical Activity, Sleep Quality, and Psychological Status. *Journal of Child and Family Studies*, *26*(3), 800–809. https://doi.org/10.1007/s10826-016-0593-4

Young, M., Voll, M., Noll, R. B., Fairclough, D. L., & Flanagan-Priore, C. (2020). Bright IDEAS problem-solving skills training for caregivers of children with sickle cell disease: a two-site pilot feasibility trial. *Pediatric Blood and Cancer*, *68*(4), 1–9. https://doi.org/10.1002/pbc.28822

Yuksekgonul, A. U., Ayse, A. T., Eyuboglu, T. S., Soysal, S., & Budakoglu, I. I. (2020). Evaluation of the psychological status of mothers of children with cystic fibrosis and the relationship between children's clinical status. *Journal of Paediatrics and Child Health*, *56*(10), 1537–1543. https://doi.org/10.1111/jpc.14983

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