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Differential impacts of the Brazilian Strengthening Families Program (SFP 10-14): A study into changes in the parenting styles of vulnerable families

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ABSTRACT

Adolescents living in low- and middle-income countries (LMICs) are not only exposed to underprivileged conditions - they are also at greater risk of being raised with negative parenting practices that may have detrimental effects on their psychosocial development and health. Thus, the implementation and evaluation of family-based interventions that foster positive parenting practices among vulnerable populations are necessary. The aim of this study is to examine if the Brazilian Strengthening Families Program (SFP) has a differential impact on parenting styles in the short, medium, and long terms. This was achieved through a single-group longitudinal design with four data collection moments. Parenting styles were assessed using the Parental Practices Scale at baseline and then after delivering the program, with follow-ups after 6/8 and 10/12 months. The sample comprised 361 adolescents aged 10–14 years from low-income families in northeastern Brazil. A combination of hierarchical and non-hierarchical cluster-analysis methods offered a four-cluster solution representing the four parenting styles: authoritative, authoritarian, indulgent, and negligent. Mixed ANOVAs revealed a main effect of time on both responsiveness and demandingness, indicating that overall levels were higher post-test than pre-test. There were improvements in the responsiveness levels among authoritarian parents, as well as improvements in the demandingness levels among indulgent parents. The Brazilian SFP (10–14) appears promising for improving parenting styles, which it does by strengthening the weakest parental aspect to enhance positive parenting in families living in underprivileged conditions.

1. Introduction

Low- and middle-income countries (LMICs) with high levels of income inequality often have children and adolescents that are at greater risk of maltreatment, violence, abuse, and neglect (Mejía, Haslam, Sanders, & Penman, 2017; Mercy, Saul, & Hillis, 2013) than their peers in countries with low levels of income inequality (Wilkinson & Pickett, 2006, 2007). A low socioeconomic status, poor health, poor schooling, and inadequate transportation systems, housing, work, and sanitation are all factors that expose youngsters and their families to vulnerable conditions (Carmo & Guizardi, 2018; Instituto de Pesquisa Econômica Aplicada [Ipea], 2018).

In addition, such deprived conditions may affect parenting practices, thus undermining positive parental behaviors and increasing the negative ones. Studies conducted in the United States (US) suggest that poverty and family economic hardship are negatively associated with parental warmth (Gonzales et al., 2011; Klebanov, Brooks-Gunn, & Duncan, 1994; Pinderhughes, Nix, Foster, Jones, & Conduct Problems Prevention Research Group, 2001), social support (Klebanov et al., 1994), and discipline, but they are positively associated with harshness (Pinderhughes et al., 2001). Similar results have been found in Brazil, where socioeconomic status was found to better predict parenting practices related to communication and positive discipline (Altafim, McCoy, & Linhares, 2018). In addition, poverty is a common

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background for the neglected children of Brazilian parents (Pasian, Benitez, & Lacharité, 2020).

Empirical evidence has documented the effects of parenting on children's developmental process and health in youth (Knerr, Gardner, & Cluver, 2013). These effects, depending up on the parenting style, can be either positive (i.e., protective) or negative (i.e., risky). According to Maccoby and Martin (1983), parenting styles result from combinations of responsiveness (e.g., affection, warmth, and involvement) and demandingness (e.g., control, monitoring, and supervision). Four basic parenting styles are therefore possible: authoritative, where parents present high levels of both responsiveness and demandingness; authoritarian, where parents present high levels of demandingness but low levels of responsiveness; indulgent, where parents present high levels of responsiveness but low levels of demandingness; and negligent, where parents present low levels of both demandingness and responsiveness.

The authoritative parenting style is generally considered the most favorable to adolescent development and health (Masud, Thurasamy, & Ahmad, 2015; Ruiz-Hernández, Moral-Zafra, Llor-Esteban, & Jiménez-Barbero, 2019). Its positive impact has been demonstrated for individual characteristics such as youth wellbeing, resilience, self-esteem, and better psychological adjustment (Basso, Fortes, Maia, Steinhorst, & Weiner, 2019; Enebrink et al., 2014; Mouton & Roskam, 2014; Ruiz-Hernández et al., 2019), as well as in academic (Masud et al., 2015) and social (Harwood & Knight, 2015) performance.

Hence, focusing on ways to strengthen positive parenting should in turn promote healthy psychosocial development and avoid risk factors and injuries among young people (Altafim & Linhares, 2016; Healy, Kaiser, & Puffer, 2018; Pedersen et al., 2019), particularly in low-income regions. Furthermore, both systematic reviews (Knerr et al., 2013; Pedersen et al., 2019) and assessments (Altafim, Pedro, & Linhares, 2016; Murta et al., 2020a, 2020b, 2020c; Santini & Williams, 2017) conducted in Brazil have shown promising results for parenting-promoting family interventions in LMICs.

The Strengthening Families Program (SFP 10-14) is a preventive family-based intervention that was developed in the US but has also been largely adapted and implemented in Latin American LMICs (Mejía et al., 2019). More specifically, SFP (10–14) was adapted and implemented in Brazil in response to a demand from the federal government for evidence-based programs that are focused on reducing health inequities, improving the family environment, and preventing drug abuse among adolescents (Murta, Nobre-Sandoval, Pedralho, Tavares, & Ramos, 2018a). Cultural adaptation of the surface structure was necessary in the form of some linguistic aspects of the materials, a reduction in written activities, recruitment procedures, and the adoption of characters and scenarios that better reflect the local reality (Murta et al., 2018b).

The SFP has been evaluated in six South American countries: Chile (Correa, Zubarew, Valenzuela, & Salas, 2012), Peru (General Secretariat of the Andean Community - GSAC [Secretaría General de la Comunidad Andina - SGCA], 2013), Ecuador, Bolivia, Colombia (Orpinas et al., 2014a), and Brazil (Murta et al., 2020a, 2020b). Quantitative measures and non-randomized sampling were applied in all the evaluations, and only in the Chilean and Peruvian studies were comparison groups used. The sample size used varied from 33 families in the Peruvian study to 173 parents in the experimental group of the Colombian study, while the dropout rate varied from 5% in Colombia to 49% and 65% in Ecuador and Brazil, respectively. In all the countries, family recruitment and SFP delivery took place in school settings, except in Brazil, where both procedures took place in the context of public services providing social assistance.

One study reported no effects (Murta et al., 2020a), but overall, the results suggested the SFP performed satisfactorily in promoting positive parenting practices, such as by reducing yelling, insults, and loss of control when children misbehave in one study (Correa et al., 2012). Another study found it improved parental involvement, consistent discipline, and monitoring and communication for health-compromising behaviors, as well as reduced parental hostility (Orpinas et al., 2014a), while improvements in parental supervision (Murta et al., 2020b) and better interaction between parents and children (GSAC, 2013) were observed in other studies.

In addition, four evaluations have been conducted in Central American countries: El Salvador (Pan American Health Organization [PAHO], 2006), Honduras (Vasquez et al., 2010), Guatemala (Maalouf & Campello, 2014), and Panama (Mejía, Ulph, & Calam, 2015). Quantitative measures, a single intervention group, and non-randomized sampling were generally used, although the Panamanian study adopted a qualitative design, while the Honduran study randomized its experimental and control groups. It is worth mentioning that although the El Salvadorian study did recruit a control group, it was not considered comparable to the experimental group. Sample sizes vary from 20 families in the experimental group of the Honduran study to 86 parents in the El Salvadorian study, with dropout rates ranging from 9.5% for adolescents to 20% for parents in El Salvador. Some studies did not report this information, however, because they were reports rather than scientific papers, or they recruited a subsample from the original sample.

Once more, the results indicated benefits in terms of parental monitoring (Vasquez et al., 2010); the ability of parents to control and manage their anger when dealing with their children, as well as better attempts to manage their children's anger (Maalouf & Campello, 2014); communication; the setting of limits and relationship roles; reduced shouting (Mejía et al., 2015); parental concern and involvement; and overall improvements in the quality of parent–adolescent interactions (PAHO, 2006).

Two other studies were conducted among Latin populations living in the US. The first studied 135 Puerto Rican families with parents who had substance-abuse problems. Comparative quantitative pre- and post-test assessments revealed improvements in dysfunctional parent–child relationships and in the quality of family interactions (Chartier, Negroni, & Hesselbrock, 2010). The second study examined 12 Mexican families using a mixed design, and it found changes in family dynamics (Orpinas et al., 2014b).

Overall, the results of the various studies are generally convergent, because they indicate a sustained positive effect of SFP in low- and middle-income countries. However, these studies never specifically analyzed the effects of SFP in terms of changes in parenting styles. Indeed, only parents with less positive parenting styles need to work on improving specific skills, so in order to better understand whether SFP has a different impact on family characteristics, it is important to distinguish SFP's impact on authoritarian, negligent, indulgent, and authoritative parenting styles.

1.1. The present study

Programs cannot be expected to "work" in the same way for people with different characteristics, nor will they function the same within different implementation contexts (e.g., schools, health services, social assistance services), because programs must be considered active, open, and embedded in social systems (Pawson & Tilley, 1997). As such, even with the available evaluations from other Latin American implementations, Brazil stands out because it is the only Portuguese-speaking country in Latin America, as well as the largest country in terms of both population and territory, so an evaluation of the Brazilian program is clearly necessary. It is important to observe whether the SFP is feasible and effective in the northeastern region of Brazil, which is one of the most economically and socially disadvantaged areas in the country (Brazilian Institute of Geography and Statistics [Instituto Brasileiro de Geografia e Estatística - IBGE], 2018; Ipea, 2018).

The SFP was implemented as part of the Federal Government's National Drug Policy (*Política Nacional sobre Drogas – PNAD)*, so the results of the Brazilian SFP will inform the decisions of whether it is worth public stakeholders continuing to invest in programs of cultural adaptation at scale (Mejía et al., 2019). Despite the positive results previously

reported, Brazilian studies have revealed inconsistencies about the SFP's effect on parental outcomes. Firstly, when comparing parenting practices related to emotional support, behavior supervision, and intrusiveness, based on a pre-test and a 10/12-month follow-up evaluation, no changes were reported (Murta et al., 2020a). Secondly, when assessing the same variables based on pre-test, post-test, and follow-ups at 6 and 10/12 months, parental supervision was the only outcome that showed significant improvements over time (Murta et al., 2020b). Consequently, further studies are needed to determine whether, and under what conditions, SFP 10-14 affects parental outcomes in the economically disadvantaged families of Brazil.

It is important to note that the abovementioned Brazilian studies into the effectiveness of SFP (Murta et al., 2020a, 2020b) treated their participants as a single group. We therefore hypothesize that the discrepancy in the results may be because families with different parenting styles respond to SFP in different ways. However, because these families were included in the same group and treated as one, any improvements in some subgroups may be negated by deteriorations in other subgroups, resulting in a much lower effect or even none at all. In addition, a psychometric study of a sample of vulnerable people indicated that the appropriateness of the adopted instrument increased when the main two latent dimensions, demandingness and responsiveness, were used as continuous variables rather than assessing the six independent parenting practices of punitive control, behavioral supervision, demand for responsibility, emotional support, autonomy granting, and intrusiveness (Pinheiro-Carozzo, Gato, Fontaine, & Murta, 2020). Thus, we hypothesize that the impact of SFP varies according to parenting style, and this may help parents to develop the weaker dimension of their specific styles and consequently achieve better parenting outcomes when raising their children.

Thus, this study aims to examine whether the Brazilian Strengthening Families Program (SFP 10-14) has different impacts according to the initial parenting style. A preliminary step in achieving this aim was to (1) verify to what extent Maccoby and Martin (1983) four parenting styles taxonomy can be observed in the present sample. After ensuring this, we (2) analyzed how the dimensions of responsiveness and demandingness varied after families engaged in the SFP program in relation to the initial parenting style, before then (3) assessing the stability of this change over time.

2. Method

2.1. Study design

This study is a single-group, longitudinal investigation over four data-collection points in time: pre-test (T0), post-test (T1), a 6/8-month follow-up (T2), and a 10/12-month follow-up (T3).

2.2. Participants

A non-randomized sample comprising 361 Brazilian adolescents was recruited in four states in northeastern Brazil: *Ceará* (CE), *Rio Grande do Norte* (RN), *Sergipe* (SE), and *Pernambuco* (PE). The adolescents were aged 10–14 (Mean [*M*] = 11.67; Standard Deviation [*SD*] = 1.36), with just over half (52.1% or 188) being boys. The SFP is a family-based program, so the adolescent needs to participate together with a parent or other caregiver. Of these, 81% were biological parents, with 94.6% being female as mothers, aunts, grandmothers, or stepmothers. Regarding household compositions, 27.42% of the adolescents lived with their father, mother, and siblings, 18% lived with their mother and siblings, 9.42% lived with just a mother and father, and 8.86% lived with a mother, stepfather, and siblings. Most families (70.6%) were beneficiaries of *Bolsa Família*, a social welfare program for low-income families in Brazil.[1] Table 1 summarizes the participants' sociodemographic characteristics.

2.3. Instruments

2.3.1. Sociodemographic questionnaire

Several sociodemographic characteristics were assessed (Table 1). Adolescents self-reported their age, Brazilian state of residence, gender, school year, their mother's educational level, family household, and whether their family received *Bolsa Família* benefit.

2.3.2. Parental practices scales (PPS)

This instrument was developed by Lamborn, Mounts, Steinberg, and Dornbusch (1991) and adapted to the Brazilian context by Teixeira, Oliveira, and Wottrich (2006). It aims to evaluate parental practices from the viewpoint of adolescents. The respondent must estimate how his or her parent behaves according to a five-point Likert scale, with responses varying from (1) *never* to (5) *always*. The version used in this study had been adapted by Nobre-Sandoval, Vinha, Iglesias, and Murta (2020) to ensure its suitability for use among a low-income population,

Table 1
Participants' sociodemographic characteristics.

Characteristics		n (%)
State	CE	19 (5.3)
	PE	175 (48.5)
	RN	107 (29.6)
	SE	60 (16.6)
Adolescent's School Year	2nd	1 (0.3)
	3rd	10 (2.8)
	4th	76 (21.1)
	5th	94 (26)
	6th	90 (24.9)
	7th	50 (13.9)
	8th	18 (5)
	9th	9 (2.5)
Mother's Educational Level	NS	14 (3.9)
	ILF	58 (16.1)
	CLF	66 (18.3)
	CHF	23 (6.4)
	HS	46 (12.7)
	T. Ed.	7 (1.9)
	U. Ed.	7 (1.9)
	DK	131 (36.3)

Note. n = sample size; CE = Ceará; PE = Pernambuco; RN = Rio Grande do Norte; SE = Sergipe; NS = Never studied; ILF = Incomplete Low Fundamental (<5 years of schooling); CLF = Complete Low Fundamental (5 to 9 years of schooling); HF = Complete High Fundamental (9 to 12 years of schooling); HS = High School (up to 12 years of schooling); T. Ed. = Technical Education (up to 14 years of schooling); U. Ed. = University Education (between 16 and 17 years of schooling); DK = Don't know.

[1] Families in extreme poverty (up to R$ 89.00 per person, per month) receive a basic monthly benefit of R$ 89.00 plus a variable monthly benefit (between R $ 41.00 and 205.00). Families in poverty (between R$ 89.01 and 178.00 per person, per month) receive the variable monthly benefit. This variable benefit depends on the number of people in the family, the presence of pregnant or breastfeeding women, and the age of the child or adolescent. The exchange rate on December 16th, 2020 was U$ 1.00 = R$ 5.09.

and its factorial structure had been analyzed by Pinheiro-Carozzo, Gato, Fontaine, and Murta (2020). The instrument comprises 23 items grouped over two dimensions, namely responsiveness with 12 items and demandingness with 11 items, with both having acceptable internal consistencies of $\alpha = 0.75$ and $\alpha = 0.76$, respectively. The total scores for each dimension were obtained by summing the scores for the relevant items (see Pinheiro-Carozzo et al., 2020).

2.3.3. Attendance

Participants' attendance in the program was assessed using an attendance sheet. Parents and adolescents needed to sign this sheet after each meeting.

2.4. Procedure

This research followed the principles embodied in the Regulatory Guidelines and Norms for Research Involving Human Beings [*Diretrizes e Normas Regulamentadoras de Pesquisas envolvendo Seres Humanos*] (Brasil. Ministério da Saúde & Conselho Nacional de Saúde. Resolução 466, de 12 de dezembro de 2012). It was submitted to, and approved by, the Ethics Committee of the Science Human Institute from the University of Brasília (Protocol number 53103516.1.0000.5540).

Participants were recruited among users of Social Assistance Reference Centers (SARC, *Centro de Referência em Assistência Social / CRAS*). SARC is a public service institute that offers services, programs, and other benefits to prevent risky situations from arising and strengthen family and community bonds. An initial invitation was extended to parents and guardians, and if accepted, the relevant adolescents were also invited. Those adolescents who formally agreed to participate signed a consent form, as did the parents and guardians. The instruments were applied individually under the supervision of trained research assistants at the particular SARC or at participants' homes.

2.5. Intervention

The intervention is described according to the Template for Intervention Description and Replication Checklist and Guide (TIDieR) (Hoffmann et al., 2014):

2.5.1. Brief name

Strengthening Families Program (SFP 10-14), which is known in Brazil as *Programa Famílias Fortes*.

2.5.2. Why

The program was designed in the United States (Kumpfer, Molgaard, & Spoth, 1996) based on the Theory of Social Learning, Theory of Social Ecology, and Theory of Family Systems (Kumpfer, Whiteside, Greene, & Allen, 2010; Kumpfer, 2014). This program seeks to improve parenting practices, develop parental effectiveness, and improve the quality of the parent–child relationship (secondary outcomes), but the main aims are to reduce child maltreatment, substance abuse, delinquency, and school failure (primary outcomes) (Kumpfer, Magalhães, & Greene, 2015).

2.5.3. What (procedures)

The SFP (10-14) is a highly structured program. Each session has objectives, content, and procedures that are determined and described in a manual (Brasil. Ministério da Saúde, 2014; Kumpfer et al., 2015). Table 2 summarizes the contents of each meeting.

2.5.4. What (materials)

The materials used included the facilitator's manual, the participant's workbook, a TV, a slide projector, a DVD player or personal computer, DVDs, a speaker, a timer, balloons, dice, office supplies, and snacks (Kumpfer et al., 1996).

Table 2
Contents for youth-, parent-, and family-sessions.

Session	Youth Session	Parenting Sessions	Family Sessions
# 1	– Get acquainted – Rules and consequences. – Dreams and goals for the future.	– Stress and common problems in youth – Qualities their want in their youth. – Love and limits. – Support youth's goals and dreams.	– Positive relations. – Support youth's goals and dreams.
# 2	– Frustrations and difficulties. – Parents stress can let them to say or do certain things. – Admire things that parents do.	– Changes in youth. – Needs for rules. – Avoiding criticism.	– Identify strengths. – Show appreciation.
# 3	– Stress: situations that can cause it, symptoms, and healthy ways to deal with it.	– Recognize and praise good behavior. – Rewards to teach new attitudes. – Point system to encourage adaptive behaviors – Build a positive relationship.	– The value of family moments. – Conduct a family moment. – Work on privileges and rewards for point systems. – Plan fun family activities.
# 4	– Rules and responsibilities. – Things work out better when they follow the rules.	– Keeping calm and respectful. – Reasonable and logical consequences.	– Connection of values, activities and decisions. – Family values.
# 5	– Alcohol, tobacco, and other drugs will hurt. – Peer resistance.	– Good listening. – Listen for feelings. – Misbehavior.	– Listening skills. – Problems solving.
# 6	– Additional peer resistance skills. – Good friends.	– Protect youth from alcohol, tobacco, and other drugs. – Effectively interaction with youth's schools. – Monitoring.	– Talk about avoiding alcohol, tobacco, other drugs, and other bad behaviors. – Setting clear expectations.
# 7	– Helping others. – Positive interaction with older teens role models.	– Family special needs. – Supporting other families.	– Review program content. – Express admiration.

Note. Adapted from: https://strengtheningfamiliesprogram.org/about.html and https://iastate.app.box.com/s/zi1e67k1xee8j183cvfx.

2.5.5. Who provided

The intervention was delivered by the SARC staff. All of them received 16 h of face-to-face training over two consecutive days delivered by *Fundação Oswaldo Cruz (FioCruz)*, a public institution engaged in implementing SFP in northeastern Brazil. This training addressed the guidelines of the National Drug Prevention Policies, risk and protective factors for adolescent health, and the conceptual bases of the SFP, as well as its format, procedures, and the materials to be used. Of the 153 facilitators, 132 were female with an average age of 35, while 80 already had experience in delivering alcohol and other interventions to prevent drug abuse. Forty-nine were permanent government employees, while 65 were temporary government employees, and 31 had another type of employment basis. In terms of education, 131 had a university degree, generally in the social or health sciences. Two facilitators were needed to deliver the youth sessions, while only one was needed for the adult sessions. All three needed to attend the family sessions.

2.5.6. How

The intervention was delivered in a face-to-face group format.

2.5.7. Where

Sessions occurred at SARC facilities or those of other related public services.

2.5.8. When and how much

The participants received the SFP's standard format, which comprises seven weekly two-hour meetings plus four weekly two-hour booster sessions. The latter were delivered to just a few groups of families (18–33% of families for each state). During the first hour, at the same time but in different rooms, parents and adolescents attended separate sessions: the adolescents' group session and the parents' group session. In the second hour, the parents and adolescents together attended a family session. Cost analyses were not performed.

2.5.9. Tailoring

As the intervention was not developed in Brazil, cultural adaptation was necessary. More information can be found in the work of Murta et al. (2018a).

2.5.10. Modifications

The intervention was intended for delivery throughout the country, so modifications were made for the local context. Additional information is available in the work of Menezes, Nobre-Sandoval, and Murta (2020).

2.5.11. How well (planned)

Intervention fidelity was assessed retrospectively by facilitators self-reporting through telephone interviews, which were conducted by the research team to verify the extent to which the intervention was being delivered as planned in the manual. Additionally, 13 randomly selected groups were directly observed.

2.5.12. How well (actual)

Fidelity was considered high (Murta et al., 2020b).

2.6. Statistical analyses

Descriptive statistical procedures—such as calculating the means, standard deviations, and frequencies—were performed for the sociodemographic data. The imputation of missing values was not performed due to the study's dropout rate (66% from pretest to the 10/12-months follow-up), and per-protocol analyses were adopted (Jakobsen, Gluud, Wetterslev, & Winkel, 2017).

A cluster analysis with responsiveness and demandingness scores was performed at T0 to identify initial parenting styles. A combination of hierarchical and non-hierarchical methods was performed to form clusters (Hair, Anderson, Tatham, & Black, 2014). The between-groups linkage method, squared Euclidian distance, and one-way ANOVA tests were carried out to determine the number of clusters and specify the centroids. The K-means method was then used to obtain the final composition of the clusters. Next, a multivariate analysis of variance (MANOVA) was performed to validate and verify cluster differences in both dimensions, and the effect sizes (ηp^2) were reported.

To avoid comparing overly discrepant groups and ensure the validity of further analyses, groups of parenting styles that were too small (less than 15 members) were omitted from subsequent analyses. In addition, to further ensure the validity of the analyses, we verified the (1) differences in sociodemographic terms and (2) differences in dropout during data collection among the parenting styles.

Thus, to inspect the sociodemographic differences among clusters, we performed 1) chi-square tests with the categorical variables of state, gender, and *Bolsa Família* beneficiary; 2) analyses of variance (ANOVAs) with the continuous variables of age, adolescent's school year, and mother's educational level; and 3) multivariate analysis of variance with youth and parent attendance. The effect sizes (ηp^2) were reported. Moreover, two analyses were performed to inspect for differences in participation and dropout among the various parenting style groups. First, to verify the association between participation in data collection and parenting style, chi-square tests were performed. Second, a previous dropout analysis showed there were three groups of participants: those who participated at all four data-collection points (non-dropouts), those who dropped out permanently (permanent dropouts), and those who dropped out but returned later (temporary dropouts). Thus, to analyze the association between dropout and parenting style, chi-square tests were performed including these three groups of participants.

Finally, a two-way mixed analysis of variance (two-way mixed ANOVA) was performed to verify the sensitivity of responsiveness and demandingness to SFP 10-14, as well as establish the stability of the program's effects over time for each parenting style. This model allowed us to compare the longitudinal effects of the program on responsiveness and demandingness (i.e., the main effect of time), as well as detect variations for the different parenting styles (i.e., the interaction effect between parenting style and time). Effect sizes (np^2) were reported.

3. Results

3.1. Four-Cluster solution validation

The normality parameters for the distribution of responsiveness (Sk = −1.03, Ku = 2.063) and demandingness (Sk = −.89, Ku = .99) at T0 were considered adequate (Kline, 2015). Thus, using the responsiveness and demandingness scores at T0, a four-cluster solution (R^2 = .6423) was obtained.

In order to verify that the cluster solution represented Maccoby and Martin's parenting styles taxonomy, a MANOVA was performed using responsiveness and demandingness as the dependent variables ($r = 0.37$, $p < .01$) and cluster groups as the independent variable. A significant multivariable effect was detected ($\lambda = .114$, $p < .001$) across parenting styles on a linear combination of responsiveness [$F(3, 270) = 179.65$, $p < .001$, $\eta p^2 = 0.666$] and demandingness [$F(3, 270) = 205.92$, $p < .001$, $\eta p^2 = .696$]. Post-hoc analyses using Bonferroni's pairwise comparisons indicated significant differences ($p < .001$) in responsiveness and demandingness among all pairs of groups (Table 3). Most parents (45.25%) were classified as authoritative, 27.74% as authoritarian, 25.18% as indulgent, and 1.82% as negligent (Table 3). In addition, levels of responsiveness were highest in the authoritative parents' cluster, followed by the indulgent, authoritarian, negligent clusters, in that order. Likewise, levels of demandingness were highest for authoritative parents, followed by the authoritarian, indulgent, and negligent ones, again in that order. Parenting style explained 66.6% of the responsiveness variations and 69.6% of the demandingness variations.

3.2. Parenting Styles: Sociodemographic characteristics

Table 4 shows the sociodemographic characteristics of the sample. The negligent cluster had only five participants, so it was excluded from subsequent analyses. What is more, the state of *Ceará* yielded few participants in each group and violated the frequency assumption of the chi-square test, so data from this state were also excluded from further analysis. No significant differences in parenting styles were found according to state, gender, and *Bolsa Família* benefits, nor were there any significant differences according to age, adolescent's school year, and the guardian's educational level ($.55 < p < .75$). The MANOVA also indicated no significant multivariable effect ($\lambda = .961$, $p = .089$) when analyzing differences in youth and parent attendance ($r = .81$, $p < .01$) according to parenting styles.

Table 3
Parenting styles clusters.

Dimensions	Cluster 1 Authoritative n = 124	Cluster 2 Authoritarian n = 76	Cluster 3 Indulgent n = 69	Cluster 4 Negligent n = 5	F (3,270)	ηp^2
Responsiveness	$M = 50.76^a$	$M = 38.64^b$	$M = 46.12^c$	$M = 17.20^d$	179.65*	0.666
	$SD = 4.01$	$SD = 4.45$	$SD = 5.34$	$SD = 5.26$		
Demandingness	$M = 47.86^a$	$M = 44.70^b$	$M = 33.25^c$	$M = 17^d$	205.92*	0.696
	$SD = 4.08$	$SD = 5.01$	$SD = 4.67$	$SD = 7.64$		

Note. Different letters represent inter-clusters difference. *$p < 0.001$. n = sample size; M = mean; SD = standard deviation.

Table 4
Sociodemographic characteristics of each parenting styles group.

Demographic Characteristics		Authoritative	Authoritarian	Indulgent
Age		$M = 11.69$	$M = 11.89$	$M = 11.38$
		$SD = 1.24$	$SD = 1.49$	$SD = 1.41$
Youth Attendance		$M = 4.63$	$M = 4.36$	$M = 5.42$
		$SD = 2.45$	$SD = 2.27$	$SD = 2.07$
Parent Attendance		$M = 4.23$	$M = 4.21$	$M = 5.22$
		$SD = 2.68$	$SD = 2.22$	$SD = 2.17$
		n (%)	n (%)	n (%)
Adolescent's Sex	F	59 (47.6)	40 (52.6)	29 (42)
	Ml	65 (52.4)	35 (46.1)	40 (58)
n/State	CE	11 (8.9)	1 (1.3)	5 (7.2)
	PE	70 (56.5)	37 (48.7)	39 (56.5)
	RN	32 (25.8)	28 (36.8)	18 (26.1)
	SE	11 (8.9)	10 (13.2)	7 (10.1)
Scholar Year	2nd	–	1 (1.3)	–
	3rd	4 (3.2)	2 (2.6)	1 (1.4)
	4th	18 (14.5)	16 (21.1)	22 (31.9)
	5th	34 (27.4)	13 (17.1)	21 (30.4)
	6th	41 (33.1)	19 (25)	10 (14.5)
	7th	15 (12.1)	12 (15.8)	10 (14.5)
	8th	6 (4.8)	7 (9.2)	4 (5.8)
	9th	3 (2.4)	5 (6.6)	–
Mother's Educational Level	NS	5 (4)	5 (6.6)	1 (1.4)
	ILF	15 (12.1)	14 (18.4)	12 (17.4)
	CLF	30 (24.2)	7 (9.2)	9 (13)
	HF	9 (7.3)	8 (10.5)	1 (1.4)
	HS	21 (16.9)	11 (14.5)	8 (11.6)
	T. Ed.	2 (1.6)	3 (3.9)	1 (1.4)
	U.	4 (3.2)	–	–
	Ed.	38 (30.6)	26 (34.2)	36 (52.2)
	DK			
Bolsa Família beneficiary	N	10 (8.1)	13 (17.1)	15 (21.7)
	Y	102 (82.3)	52 (68.4)	46 (66.7)
	DK	12 (9.7)	9 (11.8)	8 (11.6)

Note. Different letters represent interclusters difference. n = sample size; M = mean; SD = standard deviation; F = Female; Ml = Male; ; CE = Ceará; PE = Pernambuco; RN = Rio Grande do Norte; SE = Sergipe; NS = Never studied; ILF = Incomplete Low Fundamental (<5 years of schooling); CLF = Complete Low Fundamental (5 to 9 years of schooling); HF = Complete High Fundamental (9 to 12 years of schooling); HS = High School (up to 12 years of schooling); T. Ed. = Technical Education (up to 14 years of schooling); U. Ed. = University Education (between 16 and 17 years of schooling); DK = Don't know; N = No; Y = Yes.

3.3. Associations between parenting styles and participation/Dropout across evaluations

The dropout rate from baseline to the 10/12-months follow-up was 66%. In addition to the dropout of participants, a discontinuous program implementation in some SARCs contributed to this rate. No significant differences were found for parenting styles and participation at data-collection moments T1 [$X^2(2,269) = 4.63$, $p = .099$], T2 [X^2 (2,269) = 4.24, $p = .81$], and T3 [$X^2(2,269) = 0.371$, $p = .83$]. In addition, the results indicated no significant associations between permanent dropout, non-dropout, and temporary dropout for T0–T1 [X^2 (2,269) = 4.63, $p = .099$], T1–T2 [X^2 (6,269) = 8.82, $p = .18$], or T2–T3 [X^2 (6,269) = 2.34, $p = .88$] and parenting styles. Given these results, we concluded that the groups were equivalent and comparable.

3.4. Intra- and inter-group changes in parenting styles

Assumptions of distribution normality (-2.02 < Sk < 2.02 and −1.74 < Ku < 5.01), the homogeneity of variance matrices (.64 < p < .895) and covariances ($p = .062$), and sphericity ($p = .105$ for responsiveness, and $p = .495$ for demandingness) were verified for responsiveness and demandingness for each cluster. Thus, a two-way mixed ANOVA was conducted to analyze the influence of the two independent variables (parenting style and time) on responsiveness and demandingness.

Regarding responsiveness, the results revealed not only a significant main effect of parenting style [F (2, 34) = 10.115, $p < .001$, $\eta p^2 = .373$] but also a significant main effect of time [F (3, 102) = 5.33, $p = .002$, $\eta p^2 = .135$], as well as an interaction between time and parenting style [F (6, 102) = 4.73, $p < .001$, $\eta p^2 = .218$].

The main effect of time yielded differences in measures at T0 and T1 ($p = .009$), indicating that overall levels of responsiveness were higher post-test ($M = 49.90$, $SD = 1.21$) than pre-test ($M = 45.50$, $SD = .74$). Within-group analyses showed that the authoritarian group's responsiveness score at T0 was significantly lower than its level at T1 ($p = .011$) and T3 ($p < .001$), yet not at T2 ($p = .052$) (Table 5). This suggests that the authoritarian group increased its level of responsiveness immediately after the SFP 10-14 intervention, but this was lost in the medium term before being recovered in the longer term.

In the indulgent group, no differences were observed between T0 and T1, T2, or T3. However, the responsiveness score was significantly higher at T1 than at T3 ($p = .003$), indicating that the improvement in responsiveness right after receiving the program was not sufficient to be significant. Around a year later, the score decreased to levels similar to that seen before participating in SFP 10-14.

Table 5
Differences on responsiveness and demandingness over time and regarding parenting styles.

		Authoritative n = 18	Authoritarian n = 10	Indulgent n = 9
Responsiveness	T0	$M = 51.94^{a}$	$M = 37.00^{b}$	$M = 47.56^{de}$
		$SD = 4.06$	$SD = 4.76$	$SD = 4.24$
	T1	$M = 50.94^{a}$	$M = 45.00^{acd}$	$M = 53.78^{ad}$
		$SD = 4.42$	$SD = 6.74$	$SD = 10.82$
	T2	$M = 48.56^{a}$	$M = 42.50^{abc}$	$M = 47.89^{ade}$
		$SD = 7.55$	$SD = 7.92$	$SD = 5.79$
	T3	$M = 50.22^{a}$	$M = 45.30^{ac}$	$M = 45.00^{ae}$
		$SD = 4.87$	$SD = 7.11$	$SD = 5.12$
Demandingness	T0	$M = 48.00^{a}$	$M = 44.00^{b}$	$M = 35.00^{c}$
		$SD = 4.16$	$SD = 4.62$	$SD = 3.97$
	T1	$M = 47.06^{a}$	$M = 47.00^{ab}$	$M = 42.44^{ad}$
		$SD = 6.04$	$SD = 3.88$	$SD = 8.14$
	T2	$M = 46.28^{a}$	$M = 45.60^{ab}$	$M = 41.11^{ad}$
		$SD = 6.01$	$SD = 5.10$	$SD = 7.68$
	T3	$M = 49.00^{a}$	$M = 45.90^{ab}$	$M = 42.22^{d}$
		$SD = 4.61$	$SD = 6.17$	$SD = 8.45$

Note. Different letters represent difference on means. n = sample size; M = mean; SD = standard deviation.

Even though no changes were detected for the authoritative group (Fig. 1), its distance from other parental styles varied over time. Indeed, between-group analyses showed that the authoritative group's responsiveness score did not maintain its significant distance from the authoritarian group at T1 ($p = .118$), T2 ($p = .127$), or T3 ($p = .098$). Similarly, the differences between the authoritative and indulgent groups did not persist at T1 ($p = .992$), T2 ($p = 1.000$), or T3 ($p = .087$). This indicates that after SFP 10-14 application, both the authoritarian and indulgent groups achieved similar levels of responsiveness to those in the authoritative group.

Concerning demandingness, the results show that in addition to the effect of parenting style [$F(2, 34) = 8.557$, $p = .001$, $\eta p^2 = .335$], there was a significant main effect of time [$F(3, 102)$, $p = .006$, $\eta p^2 = .114$], as well as an interaction effect between time and parenting style [$F(6, 102) = 2.62$, $p = .021$, $\eta p^2 = .133$].

The main effect of time revealed differences between measures at T0 and T1 ($p = .037$) and at T0 and T3 ($p = .031$), indicating that overall levels of demandingness were higher post-test ($M = 45.50$, $SD = 1.06$) and at the 12-month follow-up than they were pre-test ($M = 45.70$, $SD = 1.05$).

Within-group analyses revealed that the indulgent group's demandingness score at T0 was significantly lower than its scores at T1 ($p = .007$), T2 ($p = .042$), and T3 ($p = .014$), indicating that the indulgent group increased its level of demandingness following the SFP 10-14, and this increase was sustained in the medium and long term (Fig. 1). No other significant longitudinal differences were observed in the remaining parental styles.

Between-group analyses also revealed that the initial distances of the indulgent group (which had the lowest demandingness scores) from the authoritative and authoritarian groups disappeared at T1 ($p = .225$ and $p = .349$, respectively) and T2 ($p = 151$ and $p = .380$, respectively) after receiving the SFP 10–14. However, the distance from the authoritative group again became significant at T3 ($p = .031$). This suggests that the indulgent group achieved levels of demandingness comparable to those in the authoritarian group in the medium and long term. They also seemed to achieve comparable levels of demandingness to those of the authoritative group in the medium term but not in the long term, mostly because the authoritative group's score also increased a little.

The negligent group was not included in any analyses, because as previously mentioned, it was excluded due to its small size being insufficient to yield valid conclusions.

4. Discussion

This study aimed to investigate whether the Brazilian Strengthening Families Program (SFP 10-14) had a different impact based on the initial parenting style, and indeed, the hypothesis about the differential impact of the Brazilian SFP was tested and confirmed. Overall, the results (a) indicate the applicability of Maccoby and Martin's taxonomy (1983) in a vulnerable population, (b) reveal that although 45.25% of parents were classed as authoritative, the combination of indulgent and authoritarian parents accounted for more than half of the sample (53%), and (c) suggest that SFP may affect parenting dimensions differently depending on the initial parenting style, and it may help strengthen the dimensions that parents are weakest in when fulfilling their parenting duties in the short term.

Maccoby and Martin's parenting styles framework (1983) seems to be applicable to low-income Brazilian families, despite the fact that

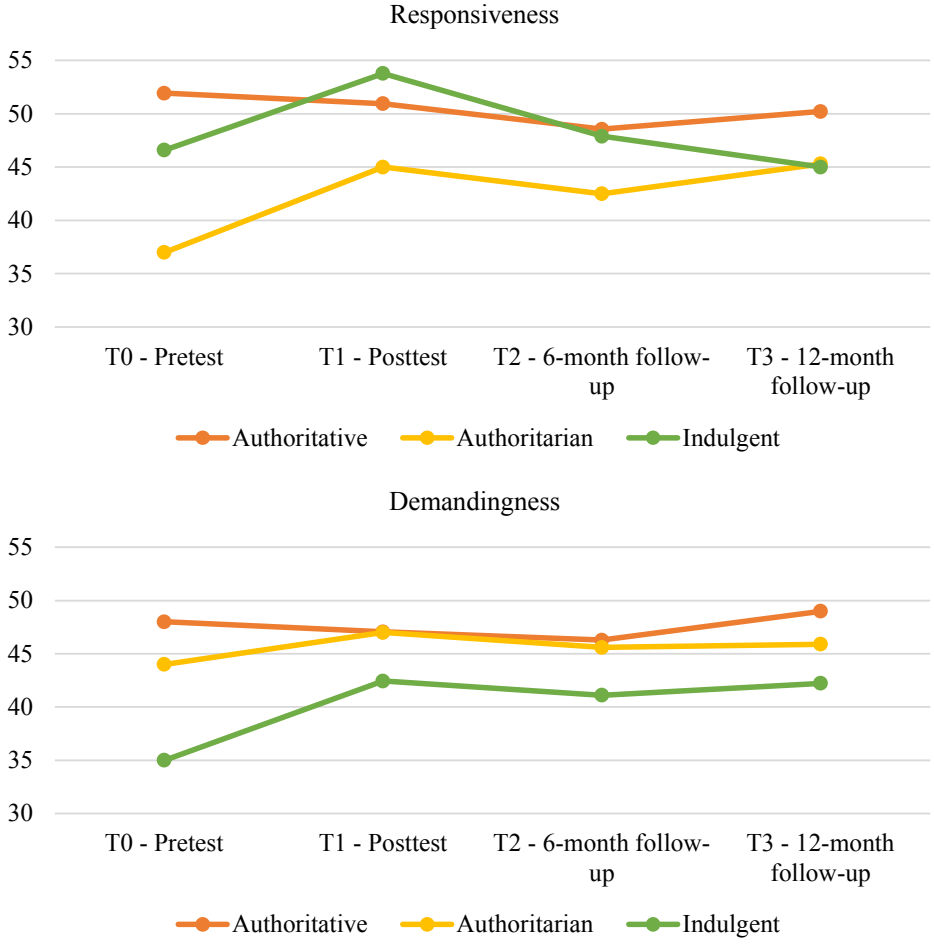

Fig. 1. Responsiveness and demandingness over time regarding parenting styles.

living in a disadvantaged socioeconomic environment can play a critical role in shaping parenting styles (Anton, Jones, & Youngstrom, 2015). Indeed, 45.25% of participating parents presented an adequate style for raising their adolescent children, namely the authoritative one. This result emphasizes that even in challenging socioeconomic contexts, many parents still apply positive parenting practices, such as providing monitoring, supervision, involvement, warmth, and support when raising adolescent children (Leung & Shek, 2018; Zhang, Edwards, & Hans, 2020). It is likely that such parents will not benefit greatly from a program that aims to develop skills that they already manifest at a high level.

The negligent style appears to be rather rare (1.82%), while the indulgent and authoritarian parenting styles are more commonplace. Indeed, taken together, these two styles corresponded to just over half (53%) of the parents in our sample, indicating that even in deprived contexts, parenting styles can vary. Although a certain degree of authoritarian parenting, intrusiveness, and hierarchical communication may be appropriate in vulnerable contexts (Beyers, Bates, Pettit, & Dodge, 2003; Eamon, 2002; Simons et al., 2002), responsiveness characteristics like emotional and social support and the granting of autonomy are also indispensable elements of positive parenting. The latter is lacking in the authoritarian parenting style, while the former is lacking in the indulgent parenting style. This observation justifies the need to invest in the development, implementation, and evaluation of interventions that focus on promoting positive parenting practices, as well as determine their effects on each individual parenting style for raising Brazilian youths.

Before conducting the analyses that led us to achieving the main objective of this study, the sociodemographic differences and attrition rates were analyzed. For the former concern, no significant sociodemographic differences for either adolescents or parents were found among the parenting style groups. The homogeneity of the sample could explain this absence of differences. Regarding the second concern, the study's rate of dropout before the final follow-up (Eysenbach, 2005) fits in with those of other publicly funded studies at between 16.8% and 65.2% (Cooper, Whitehead, Pottrill, Julious, & Walters, 2018). Furthermore, the rate of attrition was not associated with parenting style, meaning that dropout rates were equivalent among the different groups and thus valid comparisons could still be made between them. In any case, given the proportion of lost data, the results of the present study should be considered hypothesis-generating results (Jakobsen et al., 2017).

The findings in the present study indicate that both dimensions of parenting styles seem to be sensitive to the Brazilian SFP (10-14). The improvements in the demandingness dimension among indulgent parents, combined with improvements in the responsiveness dimension of authoritarian parents, both of which are considered to be the weakest dimension of each style, brought these parents closer to the authoritative style. Thus, the hypothesis that the program has a different impact depending on the initial parenting style is confirmed.

This evidence is consistent with results from Latin America that also reported improvements in parenting skills after receiving SFP 10-14 (Chartier et al., 2010; Correa et al., 2012; GSAC, 2013; Maalouf & Campello, 2014; Mejía et al., 2015; Orpinas et al., 2014a, 2014b; PAHO, 2006; Vasquez et al., 2010). However, none of these studies evaluated parenting style as a dependent variable, nor did they separate parents into groups to assess any possible differences in the program's impact, so the current study adds some valuable knowledge to the literature.

Regarding the assessments in Brazil, on the one hand, our results contradict previous research that reported no effect on parenting practices (Murta et al., 2020a). In contrast, the current study's findings for changes in the demandingness dimension is consistent with evidence of a positive effect on parental supervision (Murta et al., 2020b), which belongs to the demandingness dimension. Although both these studies were performed among vulnerable populations, there are two possible reasons that may explain these contrasting results.

First, the way the instrument was evaluated may have contributed to differences in detecting parenting characteristics. Previous studies used three factors of the instrument (out of six) to assess specific parenting practices, namely parental supervision, intrusiveness, and emotional support (Murta et al., 2020a, 2020b) and followed the scoring recommendations of Teixeira et al. (2006). The present study used all size items and scored the instrument as continuous variables along the two main dimensions of responsiveness and demandingness, following the recommendations of Pinheiro-Carozzo et al. (2020). Therefore, previous studies assessed parenting practices, while this study assessed parenting styles. Although they are similar concepts, parenting practices refer to specific behaviors and strategies applied by parents when raising children and adolescents, while parenting styles refer more to the emotional climate in which parents raise their children, and this in turn moderates the influence of specific practices (Darling & Steinberg, 1993).

Second, bundling all participants into a single group may have hidden any differences among them (Murta et al., 2020a, 2020b). In contrast, the current study divided participants into groups according to their parenting styles before they received the program. Evidently, authoritative parents were not expected to show great changes because their initial style already embodied high levels of both responsiveness and demandingness. These parents represented 45% of our total sample, so if we had combined them with authoritarian and indulgent parents, it is possible that this would have masked any improvements in the latter groups. This study therefore divided participants into groups according to initial parenting style, so we could look for differing impacts among the groups.

As a post-hoc sensitivity analysis (Thabane et al., 2013), despite the hypothesis of the study being confirmed, a repeated measure ANOVA was performed to verify whether treating participants as a single group, but using the instrument as a continuous variable, would still reveal any improvements in any of the two parenting style dimensions. Indeed, no significant differences were found in either the responsiveness ($p = .213$) or demandingness ($p = .091$) dimension over time. Next, we excluded the authoritative parents from this group, so only the authoritarian, negligent, and indulgent parents were treated as a single group. The results indicated significant improvements in responsiveness ($F(3) = 5.314$, $p = .002$, $\eta p^2 = .181$) between pre-test ($M = 41.36$) and post-test ($M = 48.48$), as well as for demandingness ($F(3) = 5.957$, $p = .001$, $\eta p^2 = .229$) between pre-test ($M = 38.14$) and post-test ($M = 44.19$) and between pre-test and the six-month follow up ($M = 43.28$). Thus, the evidence for the differential impact of the program was reinforced.

This study provides contributions for both the evaluation of the SFP 10-14 and the field of preventive science in Brazil, as well as in other Latin America countries and other LMICs. Firstly, with a degree of caution, the results obtained in this study confirm that parenting skills may improve as a short-term consequence of the SFP. However, this study also indicates greater precision, because the results suggest that the weakest dimension of each parenting style benefits from the most improvement. This study therefore reinforces the theory of change that was adopted by the SFP, even when it is implemented for a vulnerable population. Secondly, these findings indicate that we must continue investigating the Brazilian SFP, because it may represent a social technology that could prevent adolescents developing health and psychosocial problems through better parenting. Thirdly, the World Health Organization (WHO, 2014) affirms that the consequences of childhood violence are worse in LMICs and that parental factors can be targeted to address this issue. Therefore, the present findings suggest parenting interventions may change parenting knowledge and skills in LMICs in a desirable way, as shown in previous studies. Such initiatives and assessments must go ahead, because they may help to address some of the basic problems found in these countries.

This study has some limitations, however. A quasi-experimental trial with a paired control group, following Medical Research Council guidance for the piloting stage of evaluating complex interventions (Medical Research Council, 2008), was planned, but it was impossible to

implement in this specific situation. We unfortunately could not fulfill the necessary assumptions for that design due to barriers such as the implementation of agents' working conditions, governmental management weaknesses, poor infrastructure, inadequate use of methodologies in staff training, poor adherence by managers and professionals, and a lack of financial resources (Abdala et al., 2020). Thus, the absence of a comparative group, a relatively small sample size, and a high dropout rate may have impaired the internal validity of the study. Additionally, parenting styles were assessed only from the adolescents' point of view, and the parents' perspectives were not evaluated. Furthermore, most of the participating parents were females, although engaging males in parenting programs has been found to be a challenging issue around the world (Panter-Brick et al., 2014). Since the program and data collection took place at SARCs, which act as reference points for income distribution programs, some participants may have responded to the instruments under the influence of social desirability or a fear of losing their benefits (such as the *Bolsa Família*). Although the study provides valuable information about parenting styles in vulnerable families, as well as evidence for the effectiveness of a nationally adopted family-based program, the study's design precludes any widespread generalization of the results, and the findings should, stherefore, be considered with caution.

Some directions for future research emerged from this study. The Brazilian research agenda should include empirical approaches that solve the problems this study encountered in terms of participant engagement and retention, as well as implementation barriers. Parenting skills should also be reevaluated at other follow-up opportunities to verify the sustainability of positive outcomes over a longer-term perspective. The invariance of the instrument should also be tested, because this was impossible with the current sample size. In addition, studies focusing on the effectiveness of the SFP's short-, middle- and long-term outcomes are necessary. In this case, growth curve modeling seems a potential approach. The use of a larger sample size, combined with a control group, would also strengthen any future findings and the possibility of generalization. Furthermore, parenting styles should be assessed through mixed methods and diverse informants to help understand and ensure the pertinence of this outcome in the Brazilian SFP. In addition, different recommendations should be followed (e.g., Lechowicz et al., 2019; McGirr et al., 2020) to try and get more fathers to engage in parenting programs, because their involvement may further enhance the benefit for the adolescent's wellbeing. Finally, a large-scale randomized controlled trial should be pursued, one that includes all the outcomes listed in the logical model, while cost-effectiveness could complete the process of evaluating the effectiveness of the SFP.

CRediT authorship contribution statement

Nádia Prazeres Pinheiro-Carozzo: Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing. **Sheila Giardini Murta:** Conceptualization, Methodology, Writing - review & editing, Supervision, Project administration, Funding acquisition. **Jorge Julio de Carvalho Valadas Gato:** Conceptualization, Methodology, Formal analysis, Writing - review & editing. **Anne Marie Germaine Victorine Fontaine:** Conceptualization, Methodology, Writing - review & editing. **Luís Gustavo do Amaral Vinha:** Conceptualization, Methodology, Formal analysis, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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