A PREVENTION PROGRAM OF DEPRESSION IN AT-RISK ADOLESCENTS: PRELIMINARY RESULTS FROM BASELINE TO FOLLOW-UP

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Abstract

Depression in adolescence is a worldwide phenomenon, expressed by cognitive, behavioral and physical symptoms that cause significant impairment. Additionally, some adolescents show chronic levels of depressive symptoms and are more likely to experience mood disorders in adulthood. Thus, prevention of depression in adolescence is essential to avoid these life patterns.
The Program for the Prevention of Depression in Adolescents (PPDA) was adapted for the Portuguese population from the preventive program for adolescents "Mind and Health" developed by Arnarson and Craighead [1]. It's a selective prevention program, with a cognitive-behavioral basis, composed by 14 sessions.
This study aims to assess the efficacy of the PPDA, from baseline to 12-month follow-up.
The sample was composed by 52 at-risk adolescents (scores between the 75th and the 90th percentiles on the CDI), attending the eight or the ninth grade in public and private schools in Portugal, that never had depression or dysthymia (evaluated by K-SADS-PL). These at risk students were divided into two groups (the experimental group, composed by adolescents who attended the prevention program, and the TAU control group) to study the efficacy of the program. Depressive symptomatology was assessed by Children's Depression Inventory [2].
The majority of the adolescents showed a good attendance in the program and a very high degree of satisfaction with all the program sessions. Three moments of evaluation were performed: before the prevention program (pretest), after the prevention program (posttest), and 12 months of follow-up.
When compared these three evaluation moments, significant differences were found only for the experimental group. Post hoc test showed that there were significant differences between pretest and 12 month follow-up, only for the experimental group.
In the experimental group, the values of CDI came down from pretest to posttest. In the 12 month follow-up the CDI values were similar to the posttest. In the control group the differences in the three moments were not statistically significant and it was verified a more pronounced ascent in the CDI values in the 12-month follow-up.
The results suggest that PPDA is a program that can reduce symptoms of depression in at-risk adolescents. However, the enlargement of the sample, namely in the 12-month follow-up, is necessary to reinforce the results obtained.

Keywords: adolescence, adolescents, depression, prevention program

1 INTRODUCTION

1.1 Depression

Depression in adolescence is a worldwide phenomenon, expressed by cognitive, behavioural and physical symptoms that cause significant impairment. Late adolescence may reflect a critical period making it particularly vulnerable for the onset of major depression disorder and dysthymia [1].

Being a common disorder, youth depression has a recurrence rate in adulthood about 45 to 72% [3]. Considered a severe disorder, tends to be chronic and associated with several negative consequences such as school failure [4], family conflicts [5] and self-destructive behaviors, such as substance abuse and suicide [6]. Thus, prevention of depression in adolescence is essential to avoid

these life patterns. Epidemiologic evidence shows that major depression disorder in adolescents is sufficiently prevalent and impairing to warrant preventive strategies [7], such as depression prevention programs [8]. According to some meta analytic reviews, indicated and selective preventive interventions are more effective than universal ones [9]. In this sense, researchers have been increasing efforts to prevent depression in adolescents by developing progressively more specific interventions (e.g. selective and indicated prevention programs) ([1], [10]). Furthermore, a review of the literature shows that such prevention programs in youth have been mainly based on cognitive-behavioral approaches and/or interpersonal which have proved to be useful in the treatment of depression [11].

The literature reviewed by Arnarson and Craghead [1], to justify the need for an intervention program with the characteristics of "Mind and Health" included two meta-analyses ([9], [12]) that stated that the effect sizes of universal programs were small and the impact was minimal on the prevention of initial episodes of depression. Thus, the authors combined a selected and an indicated prevention program for individuals ''at risk'' for development of depression and dysthymia among adolescents. They mentioned the increase in first episodes of depression and dysthymia at about age of 15 to justify their decision to develop a program for the ages 14–15. They chose to apply the program in Iceland because students were especially available for long term study, had limited mobility and the rates of depression disorders and age of onset in Iceland were similar to those in other countries.

Since 2001, Arnarson and Craighead have developed a program for adolescents to decrease the risk of developing depression. The program designed to prevent an initial episode of major depression or dysthymia among adolescents has been investigated in Iceland and in Portugal. The Program for the Prevention of Depression in Adolescents (PPDA) was adapted for the Portuguese population, from the preventive program for adolescents "Mind and Health" [1]. It's a prevention program, with a cognitive-behavioural basis, composed by 14 structured sessions that includes components found to be effective in depression prevention programs (e.g., pleasant activities, cognitive restructuring, problem solving).

The Portuguese research about the intervention program examined changes in depressive symptoms and associated risk and protective factors among participants adolescents in the Portuguese Research Project "Prevention of Depression in Portuguese Adolescents: Study of the Effectiveness of an Intervention with Adolescents and Parents" (PTDC/MHC-PCL/4824/2012) – Funded by FCT CINEICC – Research Centre of the Study of Behavioural and Cognitive Intervention – Faculty of Psychology and Educational Sciences of the University of Coimbra. The research project is coordinated by Ana Paula Matos and has a team of psychology and education researchers, which have been applying the preventing program.

The main objectives of the Portuguese research project are (i) to identify a "risk profile" for depression in adolescence and (ii) to evaluate the effectiveness of PPDA "Mind and Health" enhancing its efficacy with the addition of a new component – the Parental Program for the Prevention of Depression in Adolescents (3PDA) – which includes some innovative contents, such as emotional validation and compassion parental skills towards their children. The inclusion of the parental component is justified with data that states the relevance of parenting practices and quality of family relationships as risk factors for the development of depressive symptoms ([13], [14]) at the same time that there is few and inconclusive research on parental components in preventive interventions with youth ([11], [15], [16], [17]).

1.2 The theoretical rationale of PPDA

As stated by the authors [1] the program "Mind and Health" is based on the cognitive behavioral model of depression and is a structured intervention designed to increase the resilience of adolescents, reducing the major cognitive-behavioural risk factors: disturbing thoughts, emotional dysregulation and behavioural problems. The rationale integrated principles of problem solving, behavioural, and cognitive models of psychopathology.

1.3 Empirical support for the efficacy of the preventive program

The efficacy and effectiveness of the program to prevent an initial episode of major depression or dysthymia have been investigated by the original authors through several randomized controlled trials. Taken together the primary results suggested that the preventing program "Mind and Health" worked well in the six [1] and twelve months follow-up [10].

The initial study was conducted with 171 fourteen-years-old “at risk” Iceland adolescents who were randomly assigned to a prevention program or a treatment-as-usual assessment only control group [1]. The posttest results indicated 0% of initial episode of depression to the experimental group (EG) (69 participants) and 2.5% to the control group (CG) (2 from 80 participants). The 6 months follow-up study revealed significantly lower rates of major depression and dysthymia at the experimental group (1.6%) than did the control group (13.3%). A 12-month follow-up study regarding the same program in a sample of 113 (14-15 years old) adolescents was made. Survival analyses indicated that the preventive effects were sustained at the end of the first year following completion of the prevention program, with only 2 participants (3.9% from 51 participants) of the experimental group reporting an initial episode versus 13 of the treatment-as-usual participants (20.97% from 62 participants). The results of a logistic regression revealed, only for control group, that initial levels of depressive symptoms significantly predicted the first episode of depression and/or dysthymia [10].

In the context of the Portuguese Project several efforts have been made in order to present the program for adolescents ([18], [19], [20]) and the program for parents ([21], [22]) and to disseminate preliminary results of efficacy of the program for depression prevention for at-risk adolescents and of the parental formation and to present the results of studies in several measures that evaluate depression risk and protective factors ([23], [24], [25], [26], [27], [28]).

1.4 Adaptation of the “Mind and Health” program

In a first step the preventive program for adolescents “Mind and Health” [1] was translated from English to Portuguese language, by a team of psychologists collaborators in the project, coordinated by the researcher responsible and also with the scientific and technical supervision of the original authors. Language, activities, exercises and examples were subjected to semantic adaptation according to the knowledge of the Portuguese culture and the interests and lifestyles of Portuguese adolescents. Before starting implementation program, a review of the manual was held by an English teacher and students, investigators and group leaders were asked for feedback.

1.4.1 PPDA resources

The PPDA includes a manual/homework book for the adolescent participants, a manual for group leaders and a set of slides in PowerPoint format, organized by session, comprising various materials taken from manuals, that are presented in an attractive way. In addition, videos, cartons and a relaxation tape were translated and adapted. The group leader encourage participants to organize a file containing all the materials of the sessions and home activity records, corresponding to the sessions contents (about relaxation, leisure and pleasant activities and moments, arguments against the negative automatic thoughts, communication with others, active listening, expression of emotions and problem solving steps).

1.4.2 Implementing PPDA

The PPDA can been implemented by qualified mental health professionals or by trained teachers or other professional educators. Every year the project implements training courses to prepare olders and news collaborators. So far the program has been implemented at school settings. To study the efficacy of the program, the at-risk students are randomly assigned to two groups: the experimental group, composed by adolescents who attended the prevention program; and the treatment-as-usual TAU assessment only control group to study the efficacy of the program. The program is developed to be administered to 14-15 year-old attending the eighth and the ninth school years.

1.4.3 Program structure (Sessions, themes, goals), group size, age of participants

The program consists of 14 sessions, with the expected duration of 60-90 minutes, designed to be implemented in a group setting in school but outside class schedules. Each group comprised until 10 elements, so that group leaders are able to provide individual attention and positive regard to adolescents in the group. The program extends for 11 weeks of application. During the first 3 weeks, sessions occur two times per week (session 1 to 6) and the remaining sessions occur once a week (session 7 to 14). In the first and last sessions is held the pretest and posttest evaluations, applying the protocol measures.

Each session is organized around a central theme, being guided by specific goals. In each session are developed individual and group activities (e.g. games, analysis exercises, reflection and debate) and

provided the respective support manual. In the final stage of each session home activities are presented (exercises of application of knowledge and skills worked in session) and a satisfaction questionnaire with the session is filled.

The present study aims to obtain preliminary efficacy data of the PPDA with Portuguese adolescents from baseline to 12-month follow-up, regarding the scores obtained by the adolescents in the Children's Depressive Inventory (CDI) [2], at intake, post-intervention and 12 months follow-up. Qualitative analyses of some variables, like participants' attendance and overall satisfaction with sessions are also studied.

2 METHODS

2.1 Participants

The sample was composed by 52 at-risk adolescents (adolescents with scores between the 75th and the 90th percentiles on the CDI from a sample of 896 subjects), collected in 15 schools in Portugal attending the eight or the ninth grade in public and private schools in Portugal, that never had depression or dysthymia. These at-risk students were randomly assigned into two groups: EG (n = 26), composed by adolescents who attended the prevention program; and the treatment-as-usual TAU assessment only CG (n = 26). Depressive symptomatology was assessed by CDI [2]. Comparing the number of boys and girls in EG and CG, no significant differences between group were found (*Chi-Square* = 2.342, df = 1, p = .220).

2.2 Procedures

First, authorization for this work was granted by the national evaluation committee on ethics that regulates and supervises the procedures followed by studies conducted in school settings. Then each school was contacted in order to request their participation. In schools that approved the research project, the executive board and teachers were contacted to schedule the presence of the researchers to inform the students about the purpose of the study, their role as participants, the voluntary nature of their participation, the confidentiality of data and their single use for research purposes. The adolescents who were willing to take part in this research project filled their consent form as well as their parents. Since cross-sectional and longitudinal studies would include a genetic profile study, a signed authorization was requested also.

Next phase included the screening – Identify and select adolescents that are in risk (with subclinical depressive symptoms – CDI scores between 75th and 90th percentiles). At risk adolescents were interviewed through the Schedule for Affective Disorders and Schizophrenia for School-age-children – Present and Lifetime Version (K-SADS-PL) [29] and Children´s Depression Rating Scale (CDRS-R) [30], just prior to the Intervention Phase, to exclude participants who met criteria for any major depression, dysthymia, bipolar disorder I or II, cyclothymia, anorexia, bulimia, psychotic disorder, alcohol or substance dependence, ADHD, ODD, or conduct disorder. These at-risk adolescents were distributed randomly in groups: EG and CG. Subsequently, the intervention was implemented.

Finally, the adolescents of the total sample, and the sample of at-risk adolescents (EG and CG) were evaluated cross-sectional and longitudinally. Risk and protective factors were measured before the interventions (M0), immediately after the intervention (M1), 6-month follow-up (M2), 12-month follow-up (M3), 18-month follow-up (M4) and 24-month follow-up (M5).

2.3 Measure

Children's Depression Inventory (CDI) [2]. CDI is used to evaluate depressive symptomatology in children and adolescents, aging 7 to 17. This instrument consists of 27 items and five factors: *negative mood*, *interpersonal problems, ineffectiveness, anhedonia* and *negative self-esteem*. Each item is composed by three possible responses ranging from 0 (no problem), 1 (moderate symptom) and 2 (presence of symptom), with a total score (sum of all items) varying between 0 and 54 points, with higher values corresponding to higher levels of depressive. To answer each item, the child/adolescent has to choose the statement that best describes him/her in the last two weeks. In the original version, the internal consistency values were high for the total and for sub-factors of the scale (α between .83 and .94) The Portuguese version of the CDI showed good internal consistency, with Cronbach's alpha of .80 for a one-dimensional structure [31].

2.4 Data analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) version 20.0 for Windows. Descriptive statistics such as frequencies, means and standard deviations were computed. Differences between frequencies were assessed by *chi-square test*.

The Mann-Whitney U test was used to compare differences between the experimental group and the control group for the three moments of evaluation (pretest, posttest, and 12-month follow-up).

The Friedman test was used to test for differences in EG and CG in the three evaluation moments (pretest x posttest x 12-month follow-up). The Post-Hoc Wilcoxon signed-rank was used to localize differences between two evaluation moments.

3 RESULTS

3.1 Sample Attrition

At pretest there were 52 subjects followed (26 in EG and 26 in CG). At posttest, the EG reduces to 21 participants (attrition of 19.2%) and the CG reduces to 15 subjects (attrition of 42%), totalling 36 subjects followed. At 12-months follow-up, the EG decreases to 14 subjects (attrition from postest to follow-up of 26.9%) and the CG decrease till 11 cases (attrition from posttest to follow-up of 15.4%), making a total of 25 follow-ups (attrition from pretest to follow-up – for EG = 46.1% and CG = 57.4%).

3.2 Attendance in PPDA

In what concerns attendance level, 88.5% of the participants attended 11 sessions or more (79% of the sessions). Two cases (7.7%) attended 10 sessions (71.4% of the sessions) and 1 case (3.8%) attended 9 sessions (57.1% of the sessions). In this sample of 26 cases, there were no drop outs while the program was running.

3.3 Satisfaction with PPDA

Regarding satisfaction with program sessions, and considering a Likert scale that varies from 1 (very unsatisfied) to 5 (very satisfied), more than a half of the adolescents, in the EG mentioned that they were satisfied or very satisfied with all the sessions. The session 11 («communication/problem solving») had the higher number of adolescents (62.5%) reporting that they were very satisfied with that session. The remaining 37.5% of the subjects were satisfied. In sessions 4, 5, and 13 («emotions/behaviours and problem solving») the number of adolescents satisfied varied between 71.4% and 82.4%. The remaining cases were very satisfied with those sessions. There are no records of insatisfaction. Only in sessions 8 and 12 («revaluation, counterarguments and choose a solution»), 5.9% and 6.7%, respectively, mentioned that they were indifferent regarding those sessions. Regarding mean values of satisfaction, session 1 («thoughts/emotions/behaviours») showed the higher mean value (M = 4.59, SD = 0.499), followed by session 7 «distorted thoughts» (M = 4.50, SD = .510) and session 11 (M = 4.48, SD = .419). Session 12 obtained the lower mean value in satisfaction (M = 4.21, SD = .676), In general, this results show that adolescents maintained high levels of satisfaction throughout the PPDA.

3.4 Evolution in CDI scores

Comparing CDI scores in pretest x posttest x follow-up, with the non-parametric *test of Friedman*, for EG and CG, only in EG significant differences were obtained (see Tabel 1).

Tabel 1 – Friedman test comparing pretest, posttest and follow-up

		Mean Rank	
EC (*n* = 12)	Pretest	2.75	*Chi-square* = 12.17
	Posttest	1.33	*df* = 2
	Follow-up	1.92	*p* = .002
CG (*n* = 4)	Pretest	2.00	*Chi-square* = 2.00
	Posttest	1.50	*df* = 2
	Follow-up	2.50	*p* = .368

Post-Hoc tests of Wilcoxon revealed that, for EG, significant differences were obtained when comparing pretest with posttest and pretest with follow-up. For CG, only a significant difference was found when pretest *and* posttest were compared (see Tabel 2).

Tabel 2 – Post-Hoc tests of Wilcoxon comparing two moments of evaluation

	Pretest *vs* Posttest		Posttest *vs* follow-up		Pretest *vs* follow-up	
	Z	*p*	*Z*	*p*	*Z*	*p*
Experimental Group	-3.44 (*n* = 21)	.001	-1.26 (*n* = 12)	.209	-2.11 (*n* = 14)	.035
Control Group	-3.07 (*n* = 15)	.002	-1.46 (*n* = 4)	.144	-.98 (*n* = 11)	.385

To report the evolution of CDI we will consider the “resilient”, “at risk” and “depressive” levels (respectively, below 75th percentile, scores < 13; between 75th and 90th percentiles, 13 – 23; above 90th percentile, > 23) and the mean scores of CDI.

Cases that remained «at risk»: at posttest, 28.6% in EG and 33.3% in CG; at follow-up: 42.9% in EG and 45.5% in CG.

Cases that became resilient: at posttest, 66.7% in EG and 66.7% in CG; at follow-up, 57.1% in EG and 36.4% in CG.

Cases that were depressive: at posttest, 4.8% in EG and 0% in CG; at 12 months follow-up, 0% in EG and 18.2% in CG.

Patterns of progress obtained for the cases that completed the 3 evaluations (pretest, posttest and follow-up):

i) Depressive subjects at follow-up (EG = 0; CG = 2 of 4; 50%): the 2 depressive cases in CG were at risk in posttest.

ii) At risk subjects at follow-up (EG = 5 of 12; 41.7%; CG = 1 of 4; 25%): In EG, 4 of 5 were resilient at posttest and 1 of 5 was always at risk. In CG, the at risk subjects at follow-up was resilient at posttest.

iii) Resilient subjects at follow-up: (EG = 7 of 12; 58.3%; CG = 1 of 4; 25%). In EG, all the 6 subjects maintained resilience since posttest. In CG the same pattern existed for the resilient subject.

According to CDI mean scores, we found that in most cases (75% of CG and 70% of EG), scores decreased from pretest to posttest and then raise from posttest to follow-up. The mean amplitude of raise from posttest to follow-up was 5.5 in EG and 10.3 in CG. In the CG, at follow-up the CDI scores were all always higher than the scores obtained at pretest. In the remaining cases (25% of CG and 30% of EG), there was a decrease from pretest to posttest and from posttest to follow-up. In these subjects, the mean amplitude of decrease from posttest to follow-up was 6.3 for EP and 4.0 for CG.

Considering the number of subjects that have CDI scores above 19 (cut off point found in international literature for clinically relevant depressive symptoms [32], [33], [34]), we found that at pretest the same number of subjects (26.9%) in EG and CG were depressive. At posttest, the CG had a higher number of depressive cases (13.3%) than the EG (9.5%). At follow-up, the number of depressive cases increased substantially (45.5%), while in EG there was a decrease (7.1%).

3.5 Differences between groups

Comparing EG x CG, at pretest, posttest and follow-up, no statistically significant differences between groups were obtained. Although the differences are not significant the CG, compared with EC, presents higher levels of CDI in the three moments of evaluation (see Table 3).

Tabel 3 – U Mann-Withney Test comparing experimental group and control group

		n	Mean Rank	
Pretest	Experimental Group	26	25.73	*U* = 318.00
	Control Group	26	27.27	*p* = .713
Posttest	Experimental Group	21	16.93	*U* = 124.50
	Control Group	15	20.70	*p* = .288
Follow-up	Experimental Group	14	10.89	*U* = 47.50
	Control Group	15	15.68	*p* = .106

4. DISCUSSION

The purpose of the study was to investigate preliminary efficacy data of the PPDA with Portuguese adolescents from baseline to 12-month follow-up, regarding the scores obtained by the adolescents in the CDI, at baseline, post-intervention and 12 months follow-up. Qualitative analyses of some variables, like participants' attendance and overall satisfaction with sessions were also studied. The findings suggested that having in account the 3 moments of evaluation (pretest, posttest and follow-up) in the EG there were significant differences, while in CG no significant differences were obtained. Although this result can be due to sample limitations, as there is dissimilarity of the size of the two groups and an especially small number of subjects in CG that have completed the three evaluation moments.

When considering all the subjects evaluated in each moment, statistical analyses (Post-Hoc Wilcoxon tests) also revealed that from pretest to follow-up there was a significant reduction in CDI scores differences only in the EG. In this comparison, the just mentioned sample limitations do not exist. This same statistical analyses also revealed that from pretest to posttest both groups showed a significant difference in CDI scores, although there is a more expressive reduction in the EG. Regarding these quantitative analyses within groups, although the number of participants in each group is still reduced, and the data diminished from pretest to posttest and from posttest to follow-up, we can conclude that partial support for the long term efficacy of the PPDA was obtained. This finding is consistent with the results obtained by the original studies of the program ([1], [10]).

Having in account the classification of the subjects in «depressive», «at risk» or «resilient» the majority of the at-risk subjects followed were resilient at posttest. We obtained that CG had always a higher number of subjects at risk at posttest and follow-up. Results suggest that with time, the tendency of the adolescents at CG is to return to «at risk» status and even to became depressive, while in EG the tendency observed, till now, is to remain resilient. All these results reinforce the importance of continuing doing follow-ups, using repetitive measures.

Having in account the internationally accepted cut-of point of 19 for clinically relevant depression symptoms, we can say that at pretest the EG and the CG were in the same condition (7 cases in each group scored higher than 19). But at posttest, the CG had a higher number of depressed subjects and this tendency accentuated in follow-up (7.1% vs 45.5%)

Observing the evolution trends, in backward, that is beginning in follow-up and ending at pretest, for the few subjects that complete the evaluation protocol at the 3 moments of evaluation (completers), we note that in CG all the 3 conditions «depressive», «at risk» and «resilient» exist and the most frequent is the depressive condition. Otherwise, in EG, the tendency of the completers is the «resilient» status and none of the adolescent became depressed. It is possible that with the enlargement of the sample these tendencies will be maintained.

In most of the participants, CDI scores fell from pretest to posttest and then increased from posttest to follow-up, but the average raise in CG is higher than in EG (10.3 vs 5.5). Besides, the CG always attained CDI scores, in follow-up, above those obtain at pretest. We can say that at 12 months follow-up, the CG is in a more disadvantageous condition than in pretest. In the EG, the raise of the CDI scores at follow-up are slight and the CDI scores remain significantly below the scores attained at pretest.

Finally, regarding differences between-group, comparing EG *vs* CG, at pretest, posttest and 12-months follow-up, no differences between these two groups were obtained. Although the differences were not significant, the CG, compared with EC, presented higher CDI scores in the 3 moments of evaluation.

Considering the evaluation of attendance level in the PPDA, we can say that the adolescents had a good rate of attendance, considering that it was a ninety minutes extracurricular volunteer activity. This data can reveal the good motivation and involvement of the participants in PPDA. The evaluation of the session satisfaction was very important because allowed to understand the overall level of satisfaction of students with each session and the total program. It allowed to identify the sessions that were more appreciated and constituted a feedback opportunity to the group leader to know the weekly opinions of participants about contents, strategies and resources. A very high degree of satisfaction with all the program sessions was reported by the adolescents.

Further follow-up studies of the efficacy of PPDA will be done with diagnostic interview The Longitudinal Interval Follow-up Evaluation (A-LIFE) [35] as was done in the original studies ([1], [10]) and with other self-reports measures included in the Portuguese project applied to adolescents and their parents. The samples are being enlarged and the period of follow-up is being extended till 24 months. One of the most relevant challenges is to deal with the mortality of the sample, since it is very difficult to involve the participants in follow-ups, mainly the CG participants. The rates of attrition were high in the present study, higher than those found by Arnarson and Craighead [10]. However, these authors mentioned that Iceland is a country where the mobility of the adolescent is especially low and their availability especially high. We tend to believe that is not the case in Portugal.

In future studies it will be recommended to analyze differences for dropout rates between EG and CG and between drop outs and completers on the measures under study, in the different moments of evaluation. In a larger sample, it will be also very important, in analyzing the PPDA efficacy in follow-up, to control the pretest level of depressive symptoms and to have information about the possible influence of gender and other moderator variables as well as about mechanisms of change.

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