

An Online Group Parent-Focused Preventive Intervention for Adolescent Depression: A Randomized Controlled Trial Based on the Partners in Parenting Framework

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Abstract

Aim: This study aimed to evaluate an online group, parent-focused preventive intervention based on a Persian-translated and format-modified version of the Partners in Parenting (PiP) framework for reducing depressive symptoms among Iranian adolescents and improving preventive parenting practices.

Method: This randomized controlled trial included 61 parent–adolescent dyads with adolescents aged 12–17 years. Participants were randomly assigned to the intervention group or the waitlist control group. Parents in the intervention group attended eight weekly 90-minute online group sessions. Adolescents completed the Children’s Depression Inventory (CDI), and parents completed the Parenting to Reduce Adolescent Depression and Anxiety Scale (PRADAS) at baseline, post-intervention, and three-month follow-up. Data were analyzed using linear mixed-effects models.

Findings: Compared with the waitlist control group, adolescents in the intervention group showed a significantly greater reduction in depressive symptoms across the assessment points. Parent-reported preventive parenting practices also improved significantly more in the intervention group, and these improvements were maintained at the three-month follow-up.

Conclusion: The online group, parent-focused intervention based on the PiP framework was associated with significant reductions in adolescent-reported depressive symptoms and significant improvements in parent-reported preventive parenting practices. These findings provide preliminary support for involving parents in preventive interventions for adolescent depression. Further research with larger samples and longer follow-up periods is warranted.

Keywords: Adolescent depression; Parenting intervention; Partners in Parenting; Prevention; PRADAS; Online intervention; Randomized controlled trial

Introduction

Adolescence is a transitional developmental period characterized by substantial biological, cognitive, emotional, and social changes. During this period, young people experience increasing academic demands, changing family relationships, heightened sensitivity to peer acceptance, identity-related concerns, and a growing need for independence. Although these changes are part of normal development, their convergence may increase adolescents' vulnerability to emotional and behavioral difficulties. Epidemiological evidence indicates that a substantial proportion of mental disorders first emerge during adolescence, making this period a critical window for prevention and early intervention (Solmi et al., 2022; Thapar et al., 2022). Among the psychological problems that may develop during this period, depression is a major public health concern because of its prevalence, early onset, recurrence, and long-term psychosocial consequences. Global evidence indicates that depression and elevated depressive symptoms affect a substantial proportion of adolescents (Shorey et al., 2022). Adolescent depression is associated with impaired academic functioning, disrupted social relationships, reduced quality of life, and an increased risk of substance use and other mental health problems. Even subthreshold depressive symptoms may persist or develop into more severe and recurrent depressive episodes during later adolescence and adulthood (Thapar et al., 2022; World Health Organization, 2021). These consequences underscore the importance of implementing preventive interventions before depressive symptoms become clinically severe.

The family environment is one of the most influential contexts in which adolescents' emotional development occurs. Parenting practices can affect adolescents' emotional regulation, cognitive appraisals, coping strategies, perceptions of interpersonal support, and responses to stressful life events. Attachment perspectives emphasize the importance of emotional availability and security within the parent–adolescent relationship, whereas family-systems perspectives view adolescent symptoms within patterns of reciprocal interaction among family members. Empirical evidence has consistently linked maladaptive parenting practices—including psychological control, harsh criticism, hostility, overprotection, inconsistent monitoring, and low emotional warmth—with a greater risk of depressive and anxiety symptoms among adolescents. In contrast, supportive parenting characterized by warmth, emotional responsiveness, constructive communication, age-appropriate autonomy support, and consistent but non-intrusive monitoring may protect adolescents against internalizing problems (McLeod et al., 2007; Pinquart, 2017; Yap et al., 2014). Parenting practices are therefore important modifiable family-level factors that can be targeted in preventive interventions for adolescent depression.

Existing family-based interventions approach adolescent emotional problems from several theoretical and clinical perspectives. Family-systems interventions focus on reciprocal interaction patterns, family structure, boundaries, communication, and the organization of relationships within the family. Attachment-based approaches emphasize emotional security, parental responsiveness, and the repair of disruptions in parent–adolescent relationships. Behavioral family interventions generally target communication skills, reinforcement patterns, monitoring, conflict management, and collaborative problem-solving. These approaches have contributed substantially to the treatment of adolescent psychological difficulties and have demonstrated the importance of involving families in mental health care (Restifo & Bögels, 2009). Nevertheless, many established family interventions were developed for adolescents who already meet criteria for a psychological disorder, require substantial therapist involvement, or depend on repeated face-to-face attendance. Such requirements may limit their accessibility as preventive programs for families whose adolescents have mild or emerging depressive symptoms. A further limitation is that many preventive interventions continue to focus primarily on adolescents themselves. Adolescent-focused programs may provide valuable coping, cognitive, or emotion-regulation skills, but their effects may be constrained when family-level risk factors remain unchanged. Parents influence adolescents’ emotional environments through everyday patterns of communication, emotional support, discipline, autonomy granting, monitoring, and responses to distress. Interventions that focus directly on these modifiable parenting practices may therefore complement adolescent-focused approaches and address upstream factors associated with the development or maintenance of depressive symptoms. Accordingly, there remains a need for a structured, accessible, and parent-focused preventive intervention that can be implemented before adolescent depressive symptoms develop into a clinically severe disorder.

The mode of intervention delivery is also important. Parents may encounter practical barriers to participating in conventional face-to-face programs, including geographical distance, transportation demands, scheduling difficulties, work and caregiving responsibilities, limited access to specialized services, and concerns about stigma. Online interventions can reduce some of these barriers by enabling parents to participate from their homes and by extending preventive services beyond specialist clinical settings. Digital mental health interventions have therefore received increasing attention as potentially accessible approaches to psychological prevention and support (Kazdin & Rabbitt, 2013; Lehtimäki et al., 2021). However, online interventions vary considerably in their structure. Some are entirely self-guided, whereas others include therapist contact, individualized feedback, synchronous meetings, or group discussion. In the present study, “online” refers to the actual delivery of the intervention through synchronous group

meetings rather than merely to the provision of digital educational materials. Parents participated in eight weekly 90-minute online group sessions that included psychoeducation, guided discussion, practical exercises, and opportunities to reflect on the application of parenting skills.

One parent-focused program relevant to the prevention of adolescent depression and anxiety is Partners in Parenting (PiP). The PiP framework was developed to translate evidence regarding modifiable parenting risk and protective factors into practical recommendations for parents. It targets parenting domains associated with adolescent internalizing problems, including the quality of the parent–adolescent relationship, parental involvement, communication, autonomy support, family rules, management of adolescent difficulties, and parental responses to anxiety and depressive symptoms. The original PiP program is an individually tailored, web-based intervention. Parents complete an assessment of their parenting practices, receive personalized feedback identifying strengths and areas for improvement, and are directed to modules corresponding to their individual needs.

Previous randomized controlled trials have provided evidence that PiP can improve parents' concordance with evidence-based parenting recommendations (Cardamone-Breen et al., 2018; Yap et al., 2019). However, evidence concerning changes in adolescent-reported depression and anxiety symptoms has been less consistent, particularly over shorter follow-up periods. These findings support the preventive relevance of the parenting domains targeted by PiP while also indicating the importance of further evaluating adolescent outcomes. In addition, previous PiP studies have primarily evaluated individually tailored and self-guided web-based formats in Western populations. Less is known about the outcomes of delivering the principal parenting domains of PiP through synchronous online group sessions or about the applicability of this approach in a non-Western context.

Parenting practices addressed by PiP can be evaluated using the Parenting to Reduce Adolescent Depression and Anxiety Scale (PRADAS). The PRADAS was developed as a parent-report measure of parents' concordance with evidence-based parenting recommendations for reducing adolescents' risk of depression and anxiety disorders (Cardamone-Breen et al., 2017). In the present study, the PRADAS was used to assess parent-reported preventive parenting practices as the secondary outcome. Adolescent depressive symptoms were assessed directly through adolescent self-report using the Children's Depression Inventory (CDI), developed by Kovacs (1992). The CDI is a widely used measure of depressive symptoms among children and adolescents, and the Persian version has demonstrated satisfactory psychometric properties in Iranian adolescents (Qaderi Bagajan et al., 2022). Using separate informants for the two outcomes

allowed depressive symptoms to be reported by adolescents and parenting practices to be reported by participating parents.

Most evidence concerning parent-focused preventive interventions has been obtained in Western countries. Cultural and contextual differences in parenting norms, family relationships, parental authority, communication patterns, help-seeking, and attitudes toward mental health may influence both the implementation and outcomes of parenting interventions. Family relationships and parental authority have a particularly central role in many Middle Eastern contexts, including Iran. Consequently, findings obtained in Western samples cannot automatically be generalized to Iranian families. Moreover, empirical evidence concerning synchronous online group interventions that work with Iranian parents to reduce adolescents' risk of depression remains limited. Evaluating such an intervention may therefore contribute to understanding whether parent-focused preventive strategies can be implemented in an accessible online group format within this context.

The intervention examined in the present study retained the principal parenting domains of the PiP framework but differed from the original PiP program in its delivery format. Rather than completing an individually tailored and self-guided web-based program with personalized feedback and recommended modules, parents participated in eight synchronous online group sessions. The program content was translated into Persian, and the delivery format was modified to include group psychoeducation, discussion, practical exercises, and guided application of parenting strategies. Accordingly, the intervention should be understood as a Persian-translated, format-modified group intervention based on the PiP framework rather than as an equivalent replication of the original individually tailored PiP program. Its group format was intended to provide structured guidance and opportunities for shared learning while addressing practical barriers associated with face-to-face participation.

The present study therefore aimed to evaluate the effectiveness of an online group, parent-focused preventive intervention based on the PiP framework in reducing depressive symptoms among Iranian adolescents. The primary hypothesis was that adolescents whose parents participated in the intervention would demonstrate greater reductions in depressive symptoms across baseline, post-intervention, and three-month follow-up than adolescents in the waitlist control group. The secondary hypothesis was that parents in the intervention group would demonstrate greater improvements in preventive parenting practices than parents in the waitlist control group. Parenting practices were examined as a secondary outcome, and no hypothesis regarding their mediating role was tested because the study did not include a formal mediation analysis.

Methodology

Study Design and Trial Registration

This study was a two-arm, parallel-group randomized controlled trial with a waitlist control condition and three assessment points: baseline (T1), post-intervention (T2), and three-month follow-up (T3). The study evaluated the effectiveness of an online group, parent-focused preventive intervention based on the Partners in Parenting (PiP) framework for reducing adolescent depressive symptoms and improving preventive parenting practices. The design and reporting of the trial were guided by the Consolidated Standards of Reporting Trials (CONSORT 2010) statement. The study protocol was registered in the Iranian Registry of Clinical Trials before participant recruitment.

Participants, Recruitment, and Eligibility Criteria

Participants were parent–adolescent dyads consisting of adolescents aged 12–17 years and one of their parents or primary caregivers. Recruitment was conducted through secondary schools in Babol, Iran, during the 2024–2025 academic year. Following ethical approval, school counselors informed parents about the study and invited potentially eligible families to participate. Interested families completed an online screening form through a secure platform. The exact number of schools approached and the overall invitation and response rates were not formally recorded.

Eligibility required adolescents to be between 12 and 17 years of age, be currently enrolled in school, have access to an internet-enabled digital device, and obtain a total score of 15 or higher on the Persian Children’s Depression Inventory (CDI) at screening, indicating elevated depressive symptoms. The cutoff score of 15 was based on the symptom-severity threshold reported by Bang et al. (2015). At least one parent or primary caregiver was also required to be willing and available to participate in the online group intervention.

Adolescents were excluded if they had a diagnosis of major depressive disorder or another severe psychiatric disorder, such as psychosis or bipolar disorder; were receiving psychological treatment or had used psychiatric medication during the preceding three months; had a significant cognitive impairment that could interfere with participation; or were judged to require immediate clinical assessment because of severe depressive symptoms, suicidal ideation, or related safety concerns. Adolescents identified as being at immediate risk of suicide were excluded from the study, their parents were promptly informed, and they were referred for urgent assessment by a psychiatrist or an appropriate emergency mental health service. Written informed consent was obtained from parents, and written assent was obtained from adolescents before enrollment.

Sample Size and Participant Flow

Sample size was estimated a priori using G*Power version 3.1 for a repeated-measures analysis involving a within–between interaction, with two groups and three assessment

points. The calculation was based on an expected medium effect size ($f = .25$), a significance level of $\alpha = .05$, statistical power of .80, and an assumed correlation of .50 among repeated measurements. After allowing for an anticipated attrition rate of approximately 20%, the target sample size was set at 70 parent–adolescent dyads. This number represented the intended recruitment target rather than the number ultimately enrolled and randomized.

A total of 78 parent–adolescent dyads were assessed for eligibility. Of these, 17 did not meet the eligibility criteria, and 61 eligible dyads completed the baseline assessment and underwent randomization. Participants were allocated to the intervention group ($n = 31$) or the waitlist control group ($n = 30$). During the study, one dyad in the intervention group and two dyads in the waitlist control group were lost to follow-up. Consequently, 58 dyads completed the three-month follow-up assessment. The overall attrition rate was 4.9% (3/61), comprising 3.2% in the intervention group (1/31) and 6.7% in the waitlist control group (2/30). Linear mixed-effects analyses incorporated all available observations from the 61 randomized dyads. Participant recruitment, allocation, follow-up, and analysis are presented in the CONSORT flow diagram (Figure 1).

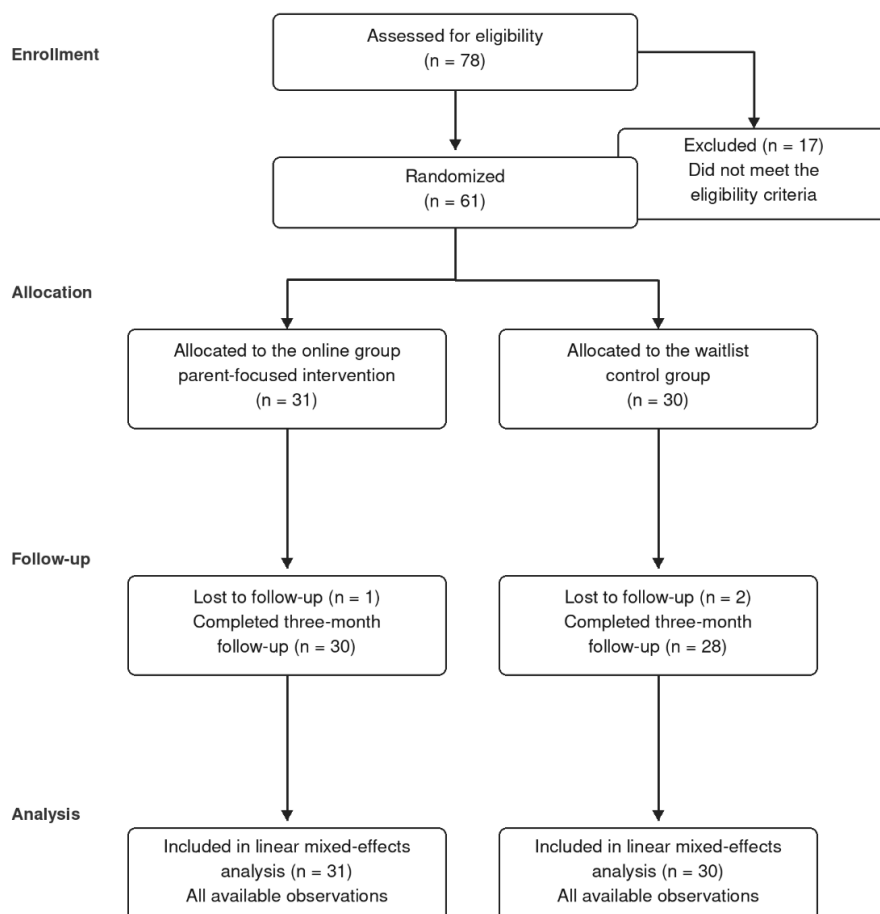


Figure 1. CONSORT flow diagram of participant recruitment, allocation, follow-up, and analysis.

Randomization, Allocation Concealment, and Blinding

Following completion of the baseline assessment, eligible parent–adolescent dyads were randomly allocated to the intervention or waitlist control group. Randomization was performed using a computer-generated block randomization sequence with a block size of four. Group allocation was implemented by an independent researcher who was not involved in participant recruitment, data collection, or statistical analysis. This procedure maintained allocation concealment until assignment to the study groups.

Because the intervention required parents to participate actively in synchronous online group sessions, blinding of participating parents was not feasible. Outcome data were collected using online self-report questionnaires completed directly by adolescents and parents at each assessment point. No interviewer-administered outcome assessment was conducted; therefore, the study did not employ an independent blinded outcome assessor. Adolescents independently reported their depressive symptoms using the CDI, whereas parents reported their preventive parenting practices using the PRADAS.

Intervention

The original PiP program is an individually tailored, web-based parenting intervention that provides personalized feedback and recommends modules according to parents' parenting strengths and areas for improvement. In the present study, the principal parenting domains of the PiP framework were retained, but the mode of delivery was modified. Instead of completing an individually tailored and self-guided web-based program, parents participated in eight synchronous online group sessions. Accordingly, the intervention examined in this study was a Persian-translated, format-modified group intervention based on the PiP framework rather than a direct replication of the original PiP program.

The intervention materials were translated into Persian to permit their use with participating parents. However, no formal cultural-adaptation process, content-validation study, or analysis of equivalence with the original individually tailored PiP program was conducted. Therefore, the terms “culturally adapted” and “equivalent to the original PiP program” were not applied to the intervention.

The intervention consisted of eight weekly 90-minute online group sessions delivered over eight consecutive weeks. It was designed to strengthen parenting practices associated with a reduced risk of adolescent depression and anxiety. The program emphasized increasing parental warmth and empathy, reducing criticism and aggressive interactions, supporting developmentally appropriate autonomy, improving parent–adolescent communication, strengthening emotion coaching and emotional validation, promoting appropriate and non-intrusive monitoring, and developing collaborative family problem-solving skills.

Each session included psychoeducation, group discussion, examples of parent–adolescent interactions, practical exercises, and guidance on applying the acquired skills in everyday

family interactions. Parents were encouraged to practice the strategies between sessions and discuss their experiences during the subsequent session. The final session reviewed the skills covered throughout the program and focused on maintaining positive parenting practices after completion of the intervention. The content and sequence of the eight sessions are presented in Table 1.

Table 1. Structure and Content of the Parent-Focused Intervention Sessions

Week	Main Session Topic	Key Focus on Parenting Skills (PiP)
1	Introduction and Program Foundation	Understanding the need for change; creating a supportive environment; introduction to program goals.
2	Parental Warmth and Empathy	Techniques for increasing emotional warmth; active listening; validating the adolescent's feelings.
3	Reducing Criticism and Aggression	Identifying negative patterns; replacing critical statements with positive requests; anger management.
4	Boundaries and Adolescent Independence	Differences between monitoring and control; fostering age-appropriate independence; negotiating rules.
5	Emotional Coaching	Helping the adolescent understand and name their feelings; the five steps of emotional coaching.
6	Collaborative Problem Solving	Introducing step-by-step models for problem-solving; focusing on win-win solutions.
7	Monitoring and Safety	Effective and non-intrusive monitoring strategies (especially in digital spaces); risk discussion.
8	Summary and Sustaining Gains	Reviewing acquired skills; planning for long-term maintenance of changes; final evaluation.

Parents assigned to the waitlist control group did not receive an intervention during the active study period. They were offered access to the program after completion of the three-month follow-up assessment.

Outcome Measures

Assessments were administered online at baseline (T1), immediately after completion of the eight-week intervention (T2), and at the three-month follow-up (T3). Adolescent

depressive symptoms measured by the CDI total score constituted the primary outcome. Parenting practices measured by the PRADAS total score constituted the secondary outcome.

Children's Depression Inventory (CDI)

Adolescent depressive symptoms were assessed using the Children's Depression Inventory (CDI), developed by Kovacs (1992) for assessing depressive symptoms in children and adolescents aged 7–17 years. The CDI is a 27-item self-report measure. Each item consists of three statements representing different levels of symptom severity and is scored from 0 to 2. Item scores are summed to produce a total score ranging from 0 to 54, with higher scores indicating greater depressive symptom severity.

The CDI assesses five dimensions: Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia, and Negative Self-Esteem. Fourteen items are presented in ascending order of symptom severity, whereas the response order of the remaining 13 items is reversed. Responses are scored according to the instrument's scoring key so that higher scores consistently represent greater symptom severity. The CDI total score was used in the present study.

For screening in general-population settings, Kovacs (1992) proposed a cutoff score of approximately 19–20, although lower thresholds may be appropriate in clinical or high-risk samples. Bang et al. (2015) identified a total CDI score of 20 as the optimal screening cutoff, with a sensitivity of .83 and a specificity of .89, and reported a score of 15 as a threshold indicating mild symptom severity. Because the optimal cutoff may vary according to the population and purpose of assessment, the CDI should be used as a screening measure rather than as a stand-alone diagnostic instrument. In the present study, a CDI total score of 15 or higher was used to identify adolescents with elevated depressive symptoms. This cutoff was based on the symptom-severity threshold reported by Bang et al. (2015). Adolescents requiring immediate clinical assessment because of severe depressive symptoms, suicidal ideation, or related safety concerns were excluded and referred for appropriate clinical evaluation.

The psychometric properties of the Persian CDI were examined by Qaderi Bagajan et al. (2022) in 480 Iranian adolescents aged 12–18 years. The findings supported its construct validity, convergent validity through its association with the Beck Depression Inventory–II, divergent validity through its association with the Teenage Inventory of Social Skills, and adequate reliability. Accordingly, the Persian CDI was considered suitable for screening depressive symptoms among Iranian adolescents. In the present sample, the CDI total score demonstrated acceptable internal consistency (Cronbach's $\alpha = .87$).

Parenting to Reduce Adolescent Depression and Anxiety Scale (PRADAS)

Parenting practices were assessed using the Parenting to Reduce Adolescent Depression and Anxiety Scale (PRADAS), developed and validated by Cardamone-Breen et al. (2017). The PRADAS is a 73-item criterion-referenced parent-report measure that assesses parents' concordance with evidence-based parenting recommendations for reducing adolescents' risk of depression and anxiety.

The scale comprises eight parenting domains: parent–adolescent relationship, parental involvement, family rules, home environment, health habits, dealing with problems, coping with anxiety, and professional help-seeking. Most items use four-point frequency response options ranging from *never* to *often* or four-point likelihood response options ranging from *very unlikely* to *very likely*. According to the original scoring procedure, each response is classified as either concordant (1) or nonconcordant (0) with the parenting guidelines. Item scores are summed to calculate the eight domain scores and a total score ranging from 0 to 73. Higher scores indicate greater concordance with recommended preventive parenting practices. Because responses are coded according to their concordance with the guidelines, conventional reverse scoring is not performed separately.

In the original validation study, the PRADAS total score demonstrated high agreement reliability (agreement coefficient = .97) and acceptable one-month test–retest reliability ($r = .78$). Convergent validity was supported by moderate-to-strong correlations with established measures of parenting, and higher PRADAS scores were associated with fewer adolescent symptoms of depression and anxiety (Cardamone-Breen et al., 2017).

A Persian-translated version of the PRADAS was administered in the present study. However, no documented forward–backward translation procedure or independent psychometric validation study was available for this Persian version. Therefore, its use in the present study should be considered preliminary. In the current sample, the PRADAS total score demonstrated satisfactory internal consistency (Cronbach's $\alpha = .91$).

Demographic Questionnaire

Parents completed a demographic questionnaire assessing adolescent and parent age and gender, parental educational level, and socioeconomic status.

Data Collection and Ethical Considerations

All questionnaires were administered through a secure online data-collection platform. Participants were informed that participation was voluntary, that their responses would remain confidential, and that they could withdraw from the study without penalty. The study protocol was approved by the relevant institutional ethics committee, and all procedures were conducted in accordance with ethical standards for research involving human participants. Written parental consent and adolescent assent were obtained before baseline assessment.

Statistical Analysis

All statistical analyses were conducted using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated for demographic characteristics and study variables. Baseline differences between the intervention and waitlist control groups were examined using independent-samples *t* tests for continuous variables and chi-square tests for categorical variables.

Changes in adolescent-reported depressive symptoms and parent-reported preventive parenting practices across baseline, post-intervention, and three-month follow-up were examined using separate linear mixed-effects models for the CDI and PRADAS total scores. Each model included fixed effects for group, time, and the group $\times$ time interaction, together with a participant-level random intercept. A variance-components covariance structure was specified for the random effects, with the random intercept accounting for within-participant correlations across repeated assessments.

The group $\times$ time interaction was considered the principal test of intervention effectiveness. Models were estimated using maximum likelihood and incorporated all available observations from the 61 randomized parent–adolescent dyads under the missing-at-random assumption. Residual Q–Q plots and residual-versus-fitted-value plots were visually inspected to evaluate normality and homoscedasticity. Effect sizes for fixed effects were reported as partial eta squared (partial η^2). Statistical significance was set at $p < .05$.

Findings

A total of 78 parent–adolescent dyads were assessed for eligibility. Of these, 17 did not meet the eligibility criteria, and 61 eligible dyads were randomly assigned to the intervention group ($n = 31$) or the waitlist control group ($n = 30$). During the study, one dyad from the intervention group and two dyads from the waitlist control group were lost to follow-up. Thus, 58 dyads completed the three-month follow-up assessment. Nevertheless, the linear mixed-effects models incorporated all available observations from the 61 randomized dyads.

Baseline Characteristics

Independent-samples *t* tests and chi-square tests were used, as appropriate, to examine baseline differences between the intervention and waitlist control groups in demographic characteristics and study outcomes. As presented in Table 2, the groups did not differ significantly at baseline in adolescent-reported depressive symptoms measured by the CDI or parent-reported preventive parenting practices measured by the PRADAS ($p >$

.05). No statistically significant baseline differences were found in the demographic variables examined ($p > .05$).

Table 2. Baseline Demographic and Clinical Characteristics of Participants

Variable	Intervention Mean $\pm$ SD	Waitlist Control Mean $\pm$ SD	Test	p
Adolescent-Reported Depressive Symptoms (CDI)	21.4 $\pm$ 5.2	21.0 $\pm$ 5.0	$t(59) = 0.31$	.76
Parent-Reported Preventive Parenting Practices (PRADAS)	51.68 $\pm$ 8.39	55.12 $\pm$ 10.40	$t(59) = -1.42$	.16
Adolescent Age (years)	12.1 $\pm$ 1.3	12.0 $\pm$ 1.4	$t(59) = 0.29$	.77
Parent Education (years)	13.4 $\pm$ 2.1	13.7 $\pm$ 2.4	$t(59) = -0.52$	.61

Note. CDI = Children's Depression Inventory; PRADAS = Parenting to Reduce Adolescent Depression and Anxiety Scale; SD = standard deviation.

Descriptive Statistics for Adolescent-Reported Depressive Symptoms

Table 3 presents the means and standard deviations of adolescent-reported depressive symptoms, measured using the CDI, in the intervention and waitlist control groups at baseline, post-intervention, and three-month follow-up. The groups had similar mean CDI scores at baseline. The mean CDI score decreased from baseline to post-intervention in the intervention group and remained lower at the three-month follow-up, whereas only a small descriptive change was observed in the waitlist control group.

Table 3. Means and Standard Deviations of Adolescent-Reported CDI Scores Across Assessment Points

Assessment Point	Intervention Mean $\pm$ SD (n)	Waitlist Control Mean $\pm$ SD (n)
Baseline (T_1)	21.4 $\pm$ 5.2 (31)	21.0 $\pm$ 5.0 (30)

Assessment Point	Intervention Mean $\pm$ SD (n)	Waitlist Control Mean $\pm$ SD (n)
Post-intervention (T ₂)	13.2 $\pm$ 4.8 (31)	20.1 $\pm$ 5.1 (30)
Three-month follow-up (T ₃)	12.6 $\pm$ 4.9 (30)	19.8 $\pm$ 5.3 (28)

Note. CDI = Children's Depression Inventory; SD = standard deviation. CDI scores were reported by adolescents.

Table 4. Linear Mixed-Effects Models for Adolescent Depressive Symptoms and PRADAS

Outcome	Effect	<i>F</i>	<i>df</i>	<i>p</i>	Partial η^2
CDI	Time	18.52	2, 118	< .001	.240
	Group	1.24	1, 59	.270	.021
	Group $\times$ Time	31.42	2, 118	< .001	.347
PRADAS	Time	24.62	2, 118	< .001	.294
	Group	2.85	1, 59	.097	.046
	Group $\times$ Time	22.84	2, 118	< .001	.279

Note. CDI = Children's Depression Inventory; PRADAS = Parenting to Reduce Adolescent Depression and Anxiety Scale. CDI scores were reported by adolescents, whereas PRADAS scores were reported by parents. Partial η^2 represents the effect size associated with each effect.

Effects of the Intervention on Adolescent-Reported Depressive Symptoms

Adolescent-reported CDI scores were analyzed using a linear mixed-effects model that included fixed effects for time (baseline, post-intervention, and three-month follow-up), group (intervention vs. waitlist control), and the time $\times$ group interaction. A participant-level random intercept was included to account for correlations among repeated observations from the same participant. The model was estimated using maximum likelihood and incorporated all available observations from the 61 randomized dyads.

The analysis showed a significant main effect of time, $F(2, 118) = 18.52$, $p < .001$, partial $\eta^2 = .240$. The main effect of group was not statistically significant, $F(1, 59) = 1.24$, $p = .270$, partial $\eta^2 = .021$. Importantly, the time $\times$ group interaction was significant, $F(2, 118) = 31.42$, $p < .001$, partial $\eta^2 = .347$, indicating that changes in adolescent-reported depressive symptoms across the assessment points differed between the intervention and waitlist control groups. As shown by the descriptive means in Table 3, CDI scores

decreased from baseline to post-intervention and remained lower at follow-up in the intervention group, whereas only small descriptive changes were observed in the waitlist control group. The complete results of the linear mixed-effects model are presented in Table 4.

To decompose the significant time $\times$ group interaction, post hoc pairwise comparisons of estimated marginal means were conducted using the Sidak adjustment. Within the intervention group, CDI scores were significantly lower at post-intervention than at baseline (mean difference = 8.20, $p < .001$) and at the three-month follow-up than at baseline (mean difference = 8.80, $p < .001$). The difference between post-intervention and follow-up was not statistically significant ($p = .980$), indicating that the reduction in depressive symptoms was maintained through follow-up. The baseline-to-post-intervention change in the waitlist control group was not statistically significant ($p = .920$). Between-group comparisons showed no significant difference at baseline ($p = .999$); however, the intervention group reported significantly lower CDI scores than the waitlist control group at post-intervention (mean difference = -6.90 , $p < .001$) and follow-up (mean difference = -7.20 , $p < .001$). Complete test statistics and confidence intervals are presented in Table 5.

Table 5. Sidak-Adjusted Post Hoc Pairwise Comparisons of Estimated Marginal Means for Adolescent-Reported CDI

Comparison	Mean Difference	SE	df	<i>t</i>	Adjusted <i>p</i>	95% CI
Intervention group						
Baseline vs. post-intervention	8.20	1.10	118	7.45	< .001	[5.50, 10.90]
Baseline vs. follow-up	8.80	1.10	118	8.00	< .001	[6.10, 11.50]
Post-intervention vs. follow-up	0.60	1.10	118	0.55	.980	[-2.10, 3.30]
Waitlist control group						
Baseline vs. post-intervention	0.90	1.10	118	0.82	.920	[-1.80, 3.60]
Between-group differences						
Baseline: intervention vs. control	0.40	1.30	59	0.31	.999	[-2.80, 3.60]

Comparison	Mean Difference	SE	df	<i>t</i>	Adjusted <i>p</i>	95% CI
Post-intervention: intervention vs. control	−6.90	1.30	59	−5.31	< .001	[−10.10, −3.70]
Follow-up: intervention vs. control	−7.20	1.40	59	−5.14	< .001	[−10.50, −3.90]

Note. CDI = Children's Depression Inventory; CI = confidence interval; SE = standard error. Within-group mean differences were calculated as the earlier assessment minus the later assessment. Between-group mean differences were calculated as intervention minus waitlist control. Probability values were adjusted using the Sidak procedure.

Parent-Reported Preventive Parenting Practices

Table 6 presents descriptive statistics for parent-reported preventive parenting practices measured using the PRADAS. The intervention and waitlist control groups had similar mean PRADAS scores at baseline. In the intervention group, the mean PRADAS score increased from baseline to post-intervention and remained above the baseline level at the three-month follow-up. In contrast, only small descriptive changes were observed in the waitlist control group.

The linear mixed-effects model showed a significant main effect of time, $F(2, 118) = 24.62, p < .001$, partial $\eta^2 = .294$. The main effect of group was not statistically significant, $F(1, 59) = 2.85, p = .097$, partial $\eta^2 = .046$. The time $\times$ group interaction was significant, $F(2, 118) = 22.84, p < .001$, partial $\eta^2 = .279$, indicating that changes in parent-reported preventive parenting practices differed between the intervention and waitlist control groups. The complete model results are presented in Table 4.

Table 6. Parent-Reported Preventive Parenting Practices Across Assessment Points

Assessment Point	Intervention Mean ± SD (n)	Waitlist Control Mean ± SD (n)	Absolute Between- Group Cohen's <i>d</i>
Baseline (T ₁)	51.68 ± 8.39 (31)	55.12 ± 10.40 (30)	0.36
Post-intervention (T ₂)	64.80 ± 8.80 (31)	56.24 ± 11.15 (30)	0.85
Three-month follow-up (T ₃)	63.85 ± 12.29 (30)	55.09 ± 11.52 (28)	0.73

Note. PRADAS = Parenting to Reduce Adolescent Depression and Anxiety Scale; SD = standard deviation. Higher parent-reported scores indicate better preventive parenting

practices. Cohen's d represents the absolute standardized between-group difference calculated using the pooled SD.

Discussion

The present study examined the effectiveness of an online group, parent-focused preventive intervention based on a format-modified version of the Partners in Parenting (PiP) framework. The significant time $\times$ group interaction indicated that changes in adolescent-reported depressive symptoms across the assessment points differed between the intervention and waitlist control groups. Post hoc comparisons showed that CDI scores decreased significantly from baseline to post-intervention in the intervention group and remained lower at the three-month follow-up, whereas the baseline-to-post-intervention change in the waitlist control group was not statistically significant. A significant time $\times$ group interaction was also found for parent-reported PRADAS scores. Descriptive findings showed increased preventive parenting-practice scores in the intervention group at post-intervention and follow-up, with moderate-to-large between-group standardized differences.

The findings concerning adolescent depressive symptoms are consistent with research emphasizing the role of parenting practices in the development and prevention of adolescent internalizing problems. Supportive parenting behaviors, including warmth, emotional responsiveness, constructive communication, and autonomy support, have been associated with lower levels of adolescent depressive symptoms. In contrast, harsh criticism, psychological control, and overcontrolling parenting have been associated with greater internalizing difficulties (McLeod et al., 2007; Pinquart, 2017; Yap et al., 2014). Developmental models similarly propose that parenting practices may influence adolescents' emotional regulation, cognitive appraisals, perceived support, and coping strategies (Morris et al., 2007).

An important feature of the present study was that the intervention was delivered to parents, whereas depressive symptoms were reported directly by adolescents. This distinction strengthens the interpretation that the intervention was associated with changes extending beyond parents' perceptions of their own parenting. The findings are compatible with ecological and family-systems perspectives, according to which

adolescent psychological development occurs within ongoing family and relational contexts (Bronfenbrenner, 1979). Nevertheless, the study did not directly assess changes in family interaction processes or test the pathways through which participation by parents may have been associated with changes in adolescent-reported symptoms.

The online group format may offer a practical approach for delivering parent-focused preventive support. Online delivery can potentially reduce barriers related to geographical distance, scheduling, transportation, and access to specialized services (Ebert et al., 2015; Kazdin & Rabbitt, 2013). The synchronous group format may also provide opportunities for discussion, shared learning, and guided practice. However, accessibility, cost-effectiveness, acceptability, and participant engagement were not formally evaluated in this study. Therefore, conclusions regarding the scalability or cost-effectiveness of the intervention should remain preliminary.

The intervention evaluated in this study differed from the original PiP program. The original program is an individually tailored web-based intervention involving personalized feedback and recommended modules, whereas the present intervention was delivered through eight synchronous 90-minute online group sessions. Accordingly, the results apply specifically to the Persian-translated, format-modified, PiP-based group intervention examined here and should not be interpreted as direct evidence regarding the original individually tailored PiP program. In addition, formal equivalence between the two delivery formats was not examined.

The significant improvements in parent-reported PRADAS scores were consistent with the parenting domains targeted during the intervention, including parental warmth, communication, autonomy support, emotion coaching, monitoring, and collaborative problem-solving. Previous evaluations of PiP have similarly reported improvements in parenting practices associated with reducing adolescents' risk of depression and anxiety (Yap et al., 2019; Yap et al., 2022). Nevertheless, PRADAS scores were reported by parents who were aware of their group allocation and intervention participation. Consequently, expectancy effects, social desirability, and response bias may have contributed to the observed differences.

The concurrent decrease in adolescent-reported CDI scores and increase in parent-reported PRADAS scores is theoretically compatible with the possibility that parenting practices contribute to adolescent emotional outcomes. However, concurrent changes in two outcomes do not establish a mediating mechanism. No formal mediation analysis was conducted, and the study was not powered to test indirect effects. Therefore, it cannot be concluded that changes in parenting practices statistically accounted for changes in adolescent depressive symptoms. Future studies with larger samples, multiple measurement occasions, and prespecified longitudinal mediation models are needed to examine this possibility.

The intervention group's mean CDI score remained lower at the three-month follow-up than at baseline. This descriptive pattern provides preliminary evidence that the observed reduction did not immediately disappear after the intervention ended. However, a three-month period represents only short-term follow-up. Moreover, the study did not report the proportion of adolescents whose scores moved below the screening threshold, recurrence of symptoms, diagnostic outcomes, or changes in functional indicators such as academic performance and social functioning. Consequently, the clinical significance and longer-term durability of the observed changes cannot be determined from the present findings.

The study had several strengths. First, the randomized controlled design with a waitlist comparison condition strengthened the internal validity of the evaluation. Second, the protocol was registered before recruitment, and participant flow was reported according to the CONSORT framework. Third, the study included outcomes reported by two different informants: adolescents reported their depressive symptoms, whereas parents reported preventive parenting practices. Fourth, the linear mixed-effects models incorporated all available observations from the randomized dyads, reducing the unnecessary exclusion of participants with incomplete follow-up data. Finally, inclusion of a three-month follow-up permitted a preliminary examination of whether the observed intervention effects were maintained after completion of the intervention.

Several limitations should also be acknowledged. First, the sample was relatively small and was recruited from secondary schools in one Iranian city, limiting the generalizability of the findings. In addition, the mean adolescent age was approximately 12 years in both groups despite an eligibility range of 12–17 years. The findings therefore primarily reflect younger adolescents and may not generalize to adolescents aged 15–17 years. The number of schools approached and the overall invitation and response rates were not fully documented, further limiting assessment of potential recruitment bias.

Second, participating parents could not be blinded to group allocation, and outcome assessment relied on online self-report measures. Although adolescents completed the CDI independently and parents completed the PRADAS, no blinded interviewer-administered outcome assessment or observational assessment of parent–adolescent interaction was conducted. Parent-reported improvements in parenting practices may therefore have been influenced by awareness of intervention participation or socially desirable responding.

Third, the intervention was a Persian-translated and format-modified group version of PiP. A formal cultural-adaptation process involving documented content validation was not conducted, and the Persian-translated PRADAS has not been independently validated in a published Iranian study. These issues should be considered when interpreting the intervention and parenting-practice findings.

Fourth, three of the 61 randomized dyads did not complete the follow-up assessment, corresponding to an overall attrition rate of 4.9%. Maximum likelihood estimation allowed all available observations to contribute to the LMM analyses under the missing-at-random assumption. However, this assumption was not formally examined, and no sensitivity analysis using complete-case data was conducted. Although the low attrition rate suggests that the influence of missing data was likely limited, the robustness of the findings to alternative assumptions about missing data remains uncertain and should be considered when interpreting the findings.

Fifth, gender, socioeconomic status, and parental education were not included as covariates in the primary LMM analyses. Randomization was intended to balance measured and unmeasured characteristics, and no significant baseline differences were detected in the variables examined. Nevertheless, residual imbalance may remain in a modest sample. Larger future trials should prespecify relevant covariates and examine whether intervention effects vary according to adolescent age, gender, baseline symptom severity, or family socioeconomic characteristics.

Finally, the study did not evaluate diagnostic remission, recurrence, academic functioning, social functioning, treatment use, intervention adherence, participant satisfaction, or potential adverse effects. Longer follow-up periods and broader clinical and functional outcomes are needed to determine the practical and clinical significance of the intervention.

The findings have preliminary implications for preventive practice. Parent-focused online group interventions may provide a useful supplementary approach for families of adolescents experiencing elevated depressive symptoms. Such programs could potentially be considered within school-based or community preventive services when appropriate screening, clinical referral, and safety procedures are available. However, implementation on a larger scale should be preceded by adequately powered trials that evaluate longer-term outcomes, participant engagement, cultural and linguistic validity, clinical significance, and possible mechanisms of change.

Conclusion

The present randomized controlled trial showed that participation in an online group, parent-focused intervention based on a format-modified PiP framework was associated with a differential pattern of change in adolescent-reported depressive symptoms across baseline, post-intervention, and three-month follow-up. A significant time $\times$ group interaction also indicated that changes in parent-reported preventive parenting practices differed between the intervention and waitlist control groups. These findings provide preliminary support for involving parents in preventive programs addressing adolescent depression. Nevertheless, the modest and predominantly younger sample, short follow-

up period, reliance on self-report measures, absence of formal mediation analysis, and modification of the original PiP delivery format require cautious interpretation. Further adequately powered studies with longer follow-up, validated culturally appropriate measures, and clinically meaningful outcomes are needed.

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