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Interventions for selective prevention of emotional problems in adolescents: a systematic review

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Abstract

The prevalence of anxiety and depression problems in adolescents is increasing and is currently an important public health problem. The aim of this study was to analyze, through a systematic review, the existing selective prevention treatments focused on the treatment of anxiety and depression symptoms in adolescents, as well as the extent of their effect and their methodological characteristics. Three international databases were used in this study: PsycINFO, Pubmed and Medline. After applying the eligibility criteria, five studies were included for review. The results revealed that the studies focused on the prevention of anxiety and depression, with great variability in terms of the methodology used and showing moderate levels of improvement only in medium to long term follow-ups. In conclusion, there is a need to expand the amount of research focusing on selective prevention for emotional problems in children and adolescents from a transdiagnostic approach that includes follow-up assessments.

Keywords: prevention; selective; anxiety; depression; review.

Resumen

Intervenciones para la prevención selectiva de problemas emocionales en adolescentes: una revisión sistemática. La prevalencia de problemas de ansiedad y depresión en adolescentes está aumentando y actualmente es un importante problema de salud pública. El objetivo de este estudio fue analizar, mediante una revisión sistemática, los tratamientos de prevención selectiva existentes centrados en el tratamiento de los síntomas de ansiedad y depresión en adolescentes, así como el alcance de su efecto y sus características metodológicas. Se utilizaron tres bases de datos internacionales para este estudio: PsycINFO, Pubmed y Medline. Después de aplicar los criterios de elegibilidad, se incluyeron cinco estudios para su revisión. Los resultados revelaron que los estudios se centraron en la prevención de la ansiedad y la depresión, con una gran variabilidad en cuanto a la metodología utilizada y mostrando niveles moderados de mejora solo en seguimientos a medio-largo plazo. En conclusión, existe la necesidad de ampliar la cantidad de investigaciones centradas en la prevención selectiva de problemas emocionales en niños y adolescentes desde un enfoque transdiagnóstico que incluya evaluaciones de seguimiento.

Palabras clave: prevención; selectiva; ansiedad; depresión; revisión.

Adolescence is a key stage in the bio-psycho-social development of individuals (Solmi et al., 2022). Although no universally accepted terminology exists, we can generally differentiate among early adolescence (10 to 13 years old), middle adolescence (14 to 17 years old), and late adolescence (approximately 18 to 21 years old) (Gaete, 2015; Güemes-Hidalgo et al., 2017). Early and middle adolescence represent particularly sensitive periods for detecting and intervening in disorders related to anxiety and depression, commonly referred to as emotional or internalizing disorders. Notably, more than half of these types of problems in adulthood have an onset age prior to 14 years old (Solmi et al., 2022).

Currently, emotional disorders represent significant public health challenges worldwide, particularly among children and adolescents (Santomauro et al., 2021; Werling et al., 2022). Data from 204 regions show a substantial increase in major depressive disorders, affecting an additional 53 million people, and a marked increase in anxiety disorders, with an additional 76 million cases (Santomauro et al., 2021). This alarming public health trend has been exacerbated by the COVID-19 pandemic, increasing the global prevalence of anxiety and depression by 25% (Garcia-Lopez, 2022; Molero et al., 2020; Racine et al., 2021). It is essential to emphasize that various risk factors for emotional disorders, such as parental upbringing, history of bullying,

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unhealthy habits, and exposure to stressful conditions, significantly impact the emotional well-being of young people.

Proper screening of adolescents with these risk factors is essential to improve their functioning and well-being (Anniko et al., 2019; Greenberg & De Los Reyes, 2022; Kemp et al., 2022; Weitkamp & Seiffge-Krenke, 2019; Nansel et al., 2003; Loewen et al., 2019; Smith et al., 2016) and to prevent the development of symptoms which may lead to emotional disorders (Caldas, 2016; Farrell & Barrett, 2007). The onset of these disorders could lead to a deterioration of the physical and mental health of young people, which is strongly associated with deteriorating social and family dynamics. This often leads to reduced academic performance and restricts them from leading a fulfilling life. Such challenges can sometimes even culminate in suicide (Ahlen et al., 2015; Bilsen, 2018; Manzar et al., 2021; Soriano-Sánchez, 2022; Swan and Kendall, 2016; Twenge et al., 2019; Verboom, 2014).

In light of the increase in the prevalence of emotional disorders, the early onset of symptomatology, and the detrimental consequences and chronicity of these disorders when untreated (Canals-Sans et al., 2018, 2019; Germani et al., 2020; Polanczyk et al., 2015; Robberegt et al., 2022), there is a pressing need to invest in early prevention interventions for young people at risk of developing emotional problems, by reducing associated risk factors or increasing protective factors in order to reduce future negative consequences of clinical conditions (Dickson et al., 2022; Coie et al., 1993; Dopp & Lantz, 2020). In turn, it has been proven that the benefits of preventive interventions in young people are greatest at the time when symptomatology begins to appear, so early detection is crucial in order to improve well-being and the prevention of future clinical disorders (Beardslee et al., 2013; Solmi et al., 2022).

According to Mrazek & Haggerty (1994) and the 2009 US Institute of Medicine report (National Research Council and Institute of Medicine, 2009), preventive interventions can be classified into universal, indicated, and selective prevention. Universal prevention interventions target populations or groups without distinctions based on risk level. Indicated preventions focus on those individuals in the population who already show incipient and detectable signs or symptoms predicting the onset of a mental disorder, even though they do not currently meet the diagnostic criteria for it. Selective preventions target individuals with certain risk factors that may lead to the development of symptomatology, compared to the general population.

In the context of these classifications, the significance of effective selective interventions becomes evident (Stockings et al., 2016). These interventions primarily provide an avenue for targeted care to individuals at heightened risk, aiming for a more efficient use of resources and potentially achieving more effective results (Gearing et al., 2013). Compared to traditional, broad-spectrum interventions, selective approaches have the potential to address the specific needs and vulnerabilities of the targeted group, thereby enhancing the likelihood of success and long-term efficacy (Ghandour et al., 2019). Over the years, the literature has emphasized the importance of understanding and refining preventive measures in mental health (Harrison et al., 2022; Miguel et al., 2023). Different studies suggest that early and targeted interventions can lead to improved outcomes, potentially reducing the risk of progression to more severe mental health conditions (Fisak et al., 2011; Werner-Seidler, 2021). Within this framework, it is imperative to distinguish among the three distinct types of prevention in preventive interventions. Adjusting the methodology and providing precise details is essential to avoid biases (Caldwell et al., 2019). Furthermore, evaluating the potential of selective prevention as an independent approach is crucial, especially considering the current challenges confronting today's youth.

This systematic review focuses on the last type of prevention, specifically examining preventive interventions for emotional problems in the presence of risk factors suggesting a likely occurrence of these issues in the future. Stemming from this need, the objective of this research is to identify the presence and extent of the effects of selective preventive interventions for anxiety and depression in children and adolescents, while analyzing the methodological characteristics and psychological techniques employed.

Method

Procedure

This review was not pre-registered. This systematic review followed the guidelines proposed in the updated guide for reporting systematic reviews PRISMA (Page et al., 2021), conducting the search in three scientific databases, namely PsycINFO, Pubmed and Medline. The search keywords were: "Selective", "Prevention", "Preventive", "Anxiety", "Anxious", "Depression", "Depressive", "Emotional", "Internalizing", "Adolescent", "Adolescence", "Youth" and "Young". The resulting search command used was (selective) AND (prevention OR preventive) AND (anxiety OR anxious OR depression OR depressive OR emotional OR internalizing) AND (adolescent OR adolescence OR youth OR young). The search in the three databases was limited to the title and abstract fields. Similarly, for the PsycINFO search, the filters of empirical works, School Age (6-12yrs), Adolescence (13-17) and research in English or Spanish were used; for Pubmed and Medline, the filters Clinical Trial, Child 6-12 years, adolescent 12-18 years and articles in English and Spanish were selected.

No time filters were used, being the review of all existing works until June 2023. Once the potentially eligible articles had been selected by reading the title and abstract, we proceeded to a full reading of the research to verify compliance with the inclusion and exclusion criteria.

Eligibility criteria

In view of the general objective of this systematic review, the selection of studies had to meet the following criteria: a) Research written in English or Spanish; b) Studies with the presence of the keywords in the title and/or abstract of the article; c) Papers on preventive interventions targeting or including discrete groups of adolescents at risk of developing emotional problems (selective prevention), which have to be the primary, and not the secondary problem; d) Papers assessing the effects of selective preventive interventions on anxiety and/or depression as the primary outcome; e) Research with a population age ranging from 12 to 18 years old; f) Non-duplicated research.

Exclusion criteria were: a) Research published in a language other than English or Spanish; b) Non-experimental work: theoretical, observational or correlational studies; c) Studies on preventive interventions targeting or including differentiated groups of adolescents with subclinical levels of anxiety and/or depression (indicated prevention); d) Studies on preventive interventions targeting populations or groups without distinctions based on risk level (universal prevention).

Study selection and data extraction

MVF and DJV, both researchers, separately assessed the titles and abstracts of the found records. Each then read the complete text of the pre-chosen records on their own. From those that fit the eligibility requirements, data was collated into a database for subsequent review.

The details extracted were: 1) Authorship and publication year, 2) Language used, 3) Objective of the study, 4) Sample details (including Age and Country of origin), 5) Type of intervention, 6) Evaluated variables, 7) Potential bias risk, 8) Group assignment, 9) Intervention specifics, 10) Instruments used for depression/anxiety evaluation, 11) Follow-ups, and 12) Results.

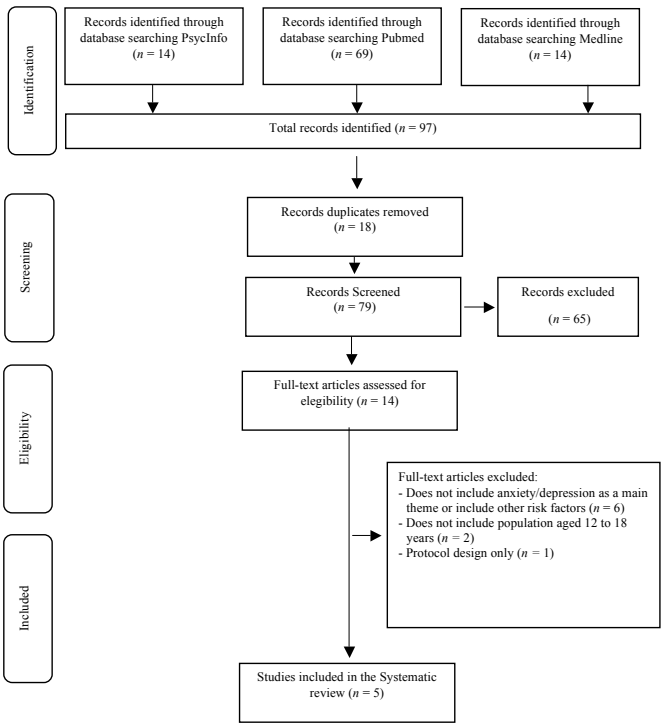
Risk of bias

The Cochrane Collaborations risk of bias tool (Higgins et al., 2011) was used to assess the risk of bias of the research included in this review. Two reviewers, authors of this paper, independently analysed the methodological quality of the research by taking into account: (a) selection bias, analysing whether the research has an adequate method for assigning interventions, based on a random process and the concealment of assignments from recruiters; (b) performance bias, referring to the blinding of participants and treatment operators; (c) detection bias, referring to the blinding of the assessors of the interventions; d) attrition bias, which refers to the description of differences between groups due to drop-outs and e) reporting bias, which refers to the report of results in line with the stated objectives. Each of the five domains described above was assessed as: low risk of bias, where there was bias with little likelihood of significantly altering the results; unclear bias, where there was some doubt about the results; and high risk of bias, where existing bias seriously undermined confidence in the results.

Disagreements regarding the presence of bias were resolved by consensus at a meeting between the three authors. Papers were classified into high quality studies (low risk of bias in three or more of the five domains) and low-quality studies (high or unclear bias in three domains).

Results

Figure 1. Flow diagram studies included in the systematic review



A summary of the study review process can be seen in Figure 1. The first search produced 97 publications, including 18 duplicate publications. After discarding the duplicate publications, the remaining 79 publications were reviewed, analysing the title and abstract of each study against the selection criteria described above and discarding, as a result of this analysis, 65 publications. The remaining 14 publications were analysed in depth by two of the researchers, discarding 6 for not including anxiety or depression as the main topic or for including risk factors unrelated to psychology; 2 for not being suitable for a population between 12-18 years old; and 1 for not having any results which could be analysed as it was a protocol design. Finally, 5 articles were extracted for review, after applying the selection criteria previously described. The main objective of the studies selected for review was to determine the effectiveness of preventive treatment in adolescents below 18 years old with anxious-depressive symptoms. A general description of the included studies and a summary of the findings can be found in Table 1 and Table 2.

Geographic distribution of the studies

The research studies under review were conducted across three different countries, with all of them being written and published in English. Regarding the place where the research was conducted, one was performed in the United States (Knapp et al., 2020), two in the Netherlands (Kindt et al., 2014; Topper et al., 2017), and two in Spain (Balle & Tortella-Feliu, 2010; Vivas-Fernandez et al., 2023).

Sample characteristics

The selected studies primarily focused on adolescents, with a specific age range of interest being 12 to 18 years old. However, it's worth noting that while all studies are aimed at adolescents, some of them also include populations slightly younger or older (Balle & Tortella-Feliu, 2010; Topper et al., 2017). The setting chosen for the interventions was the family setting (Knapp et al., 2020), the school setting (Balle & Tortella-Feliu, 2010; Kindt et al., 2014), and out-of-school time, in group settings either face-to-face (Topper et al., 2017) or online (Vivas-Fernandez et al., 2023). The sample size of the studies ranges between 88 (Knapp et al., 2020) and 1440 adolescents (Kindt et al., 2014).

Objectives of the studies

In terms of the objectives of the reviewed studies, all of them are prevention programs aimed at reducing and preventing emotional problems. One study, conducted by Knapp et al. (2020), mainly focuses on the reduction of anxiety symptoms, assessing the effects on both anxiety and depression symptoms. In comparison, another study by Balle & Tortella-Feliu (2010) concentrates on treating symptoms of both anxiety and depression. Yet another study, by Kindt et al. (2014), directs its focus on the prevention of depressive symptoms. Additionally, a study by Topper et al. (2017) centers on treating repetitive negative thinking, aiming to reduce anxiety and depressive symptoms through this approach. Finally, the study by Vivas-Fernandez et al. (2023) aimed to risk factors and promoting protective factors in adolescents that were considered emotionally vulnerable.

Outcome measures

Regarding the instruments used in the studies for the assessment of anxious-depressive symptomatology as primary outcomes,

Table 1. General description of the study characteristics

Author and year of publication	Language	Study purpose	Sample (N) M. age, SD and Country	Type of intervention	Variables assessed	Risk of bias				
						a	b	c	d	e
Balle & Tortella-Feliu (2010)	English	To test the efficacy of a programme (Thoughts and Feelings) to prevent the onset of depressive disorders in an adolescent population with symptoms. 12-month follow-up results	*N* = 613 (61 % girls) 11 - 17 years old *M* = 13.63; SD = 1.34 (Spain)	CBT	Anxiety and depression	+	-	-	+	+
Kindt et al., (2014)	English	To determine whether the depression prevention program called Op Volle Kracht (OVK) has a selective preventive effect on targeted adolescents living in low-income areas in the Netherlands.	*N* = 1343 (51.1 % girls) 11 - 16 years old *M* = 13.42; SD = 0.77 (Netherlands)	CBT and social problem-solving and coping skills	Depressive symptoms, ethnical background, parental, psychopathology and motivation and perceived atmosphere	-	-	-	+	+
Knapp et al., (2020)	English	To test the effects of an anxiety sensitivity improvement programme (ASAP-Y) for young people with high anxiety sensitivity. Results of 1 month follow-up.	*N* = 88 (51.1 % boys) 10 - 14 years old *M* = 12.52; SD = 1.41 (EEUU)	Psychoeducation and exposure training	Anxiety and depression	+	?	‘	+	+
Topper et al., (2017)	English	To evaluate the efficacy of a preventive intervention for anxiety disorders and depression by targeting excessive levels of repetitive negative thinking.	*N* = 251 (83.7 % girls) 15 - 22 years old *M* = 17.45; SD = 2.09 (Netherlands)	Rumiation-focused CBT	Repetitive negative thinking, anxious-depressive symptomatology, eating disorders symptomatology, alcohol consumption, self-report measures of clinical diagnoses and life stress events	+	?	?	?	+
Vivas et al., (2023)	English	Aims to evaluate the effectiveness of three interventions (PROCARE+, PROCARE, and ACC) in the selective prevention of emotional disorders in at-risk adolescents. It seeks to improve emotional risk factors, resilience, quality of life, emotional regulation skills, and symptoms of anxiety and depression	*N* = *208* (48.5 % girls) 12 - 18 years old *M* = 14.32; SD = 1.75 (Spain)	CBT	Emotional state, anxiety, depression, resilience, quality of life, emotion regulation, emotional flexibility, bullying situations, stress related to COVID-19, health and lifestyle habits and parental expressed emotion:	+	+	+	?	+

Note: CBT (Cognitive Behavioural Therapy). a = selection bias; b = performance bias; c = detection bias; d = attrition bias; e = reporting bias; + = low risk of bias; - = high risk of bias; ? = unclear risk of bias.

Table 2. Summary of study findings

Author and year of publication	Group assignment	Intervention	Assessment Variables & instruments	Follow-ups	Results
Balle & Tortella-Feliu (2010)	Random EG (*n* = 47) CG (n = 53) WLC (n = 45)	EG (Prevention Group): in a school setting (groups of 10-12 members) 6 sessions (twice a week). The programme includes education regarding anxiety, the basics of some emotional regulation techniques (activation control strategies, controlled breathing, relaxation and cognitive distraction), and gradual exposure to feared situations (including interoceptive exposure). CG: No methodology is specified. WLC: Waiting list control group.	Anxiety and depression: CASI (Silverman et al., 1999) SCAS (Spence, 1998) DICA-R (Reich et al., 2000)	Pre, post, follow-up at 6 months	Youth in the intervention condition showed a reduction in anxiety sensitivity of 24.83%, anxiety symptoms of 33.98% and depressive symptoms of 18.28% at six-month follow-up, in comparison to 17.74%, 22.31% and 23.50%, respectively, in the waiting list control group. In the control group, no significant differences were found in any of the post-treatment measures.
Kindt et al., (2014)	Random OVK (*n* = 667) CG (*n* = 676)	EG (OVK): consists of 16 weekly lessons delivered during school hours by trained teachers. It incorporates cognitive behavior therapy (CBT) techniques, social problem-solving, and coping skills. Participants engage in pen and paper exercises, group discussions, role-plays, and homework assignments. CG: No intervention.	Depressive symptoms: CDI (Kovacs, 1985)	Pre, post, follow-up at 6 months and 12 months	The OVK program did not yield a significant reduction in depressive symptoms one year after the intervention. Surprisingly, there was an unintended consequence observed, where clinical depressive symptoms actually increased during the one-year follow-up period.
Knapp et al., (2020)	Random EG (*n* = 44) CG (*n* = 44)	EG (ASAP-Y): at home, individually. It consists of two parts: Part I: psychoeducation regarding the nature of anxiety and anxiety sensitivity, and an individual experimenter-led exposure session of 10 repeated trials of controlled breathing through a straw; Part II: training of parents to perform and supervise exposure exercises at home once a week (four times in total) during the follow-up period. CG: At home, individually. It consists of two parts as well: Part I: psychoeducation regarding the benefits of healthy dietary habits and the practice of using a "food tracker" to plan, record and monitor the nutritional information of meals; Part II: training of parents in the use of the "food tracker" and training in meal planning and monitoring.	Anxiety and depression: ADIS-C (Silverman & Albano, 1996) PANAS (Joiner et al., 1996) CASI (Silverman et al., 1991) RCADS (Chorpita et al., 2000)	Pre, post, follow-up 2 weeks and 1 month	Youth in the intervention condition showed significantly lower levels of anxiety sensitivity (23% reduction) at the one-month follow-up period when compared to youth in the control group (14% reduction).
Topper et al., (2017)	Random Group intervention (*n* = 82) Internet intervention (*n* = 84) Waitlist control (*n* = 85)	EG: It includes elements of psycho-education, functional analysis, identification of warning signs, and the planning of alternative responses. The intervention aims to shift individuals from dysfunctional, worrisome, and ruminative thinking patterns to a more helpful and concrete thinking style, while promoting behavioral activation and approach behavior. It is delivered in both group and internet formats, with slight differences in delivery method but identical content WLC: Waiting list control group.	Repetitive negative thinking, anxious-depressive and eating disorders symptomatology, alcohol consumption, self-report measures of clinical diagnoses and life stress events: PSWQ (Meyer et al., 1990) RRS (Nolen-Hoeksema & Morrow, 1991) PTQ (Ehring et al., 2011) BDI-II (Beck, Steer & Brown, 1996) MASQ-D30 (Wardenaar et al., 2010) PHQ-9 (Spitzer et al., 1999) GADQ-IV (Newman et al., 2002)	Pre, post, follow-up at 3 months and 12 months	Both the group-based and online versions of the preventive intervention showed effectiveness in reducing repetitive negative thinking, as well as symptoms of anxiety, depression, and general distress. These reductions were sustained over time, and there were no significant differences in symptom reduction between the group-based and online RFCBT interventions.

Author and year of publication	Group assignment	Intervention	Assessment Variables & instruments	Follow-ups	Results
Vivas et al., (2023)	Random PROCARE (*n* = 66) PROCARE+ (*n* = 70) ACC (*n* = 72)	EG (PROCARE): Utilizes evidence-based cognitive-behavioral therapy (CBT) strategies to address emotional disorders. The primary goal of PROCARE is to facilitate change by improving emotional reactivity and regulation skills, enhancing distress tolerance, and reducing maladaptive emotional behaviors. EG (PROCARE+): It builds upon PROCARE by incorporating tailored modules based on the specific risk factors identified in each individual adolescent. This personalized approach allows for targeted interventions to address the unique challenges and needs of each participant. CG (Active control condition): Is an intervention designed for adolescents at risk of social anxiety and/or depression. Utalk focuses on emotional psychoeducation in a group setting, emphasizing open discussions about thoughts, feelings, and behaviors related to emotions, while providing support around distressing events commonly experienced by adolescents	Emotional state, anxiety, depression, resilience, quality of life, emotion regulation, emotional flexibility, bullying situations, stress related to COVID-19, health and lifestyle habits and parental expressed emotion: SDQ (Goodman, 1997) DERS (Gratz & Roemer, 2004) RCADS-30 (Sandín et al., 2010) WAM-C/A (Greco et al., 2004)	Pre, post, follow-up at 6 months and 12 months	The PROCARE+ intervention showcased its effectiveness in significantly reducing emotional symptoms immediately after the intervention and at both follow-up points. These findings highlight the impact of PROCARE+ when compared to a control group and PROCARE.

Note. EG= Experimental Group; CG= Control Group; WLC= Waiting list control group; M = Mean; SD = Standard Deviation; Pre = Pretest; Post = Postest. ADIS-C (Anxiety Disorders Interview Schedule for Children); BDI-II (Beck Depression Inventory-II); CASI (Childhood Anxiety Sensitivity Index); CDI (Children's Depression Inventory); DERS (Difficulties in Emotion Regulation Scale); DICA-R (Diagnostic Interview of Children and Adolescents-Revised); GADQ-IV (Generalized Anxiety Disorder Questionnaire-IV); MASQ-D30 (Mood and Anxiety Symptom Questionnaire-D30); PANAS (Positive and Negative Affect Schedule); PHQ-9 (Patient Health Questionnaire-9); PSWQ (Penn State Worry Questionnaire); PTQ (Perseverative Thinking Questionnaire; RCADS (Revised Child Anxiety and Depressive Scales); RRS (Ruminative Response Scale); SCAS (Children Anxiety Scale); SDQ (Strengths and Difficulties Questionnaire); WAM-C/A (Willingness & Action Measure for Children and Adolescents).

the following were found: the *Mood and Anxiety Symptom Questionnaire-D30* (MASQ-D30; Wardenaar et al., 2010), a 30-item instrument to measure nonspecific general distress as well as symptoms specific to depression and anxiety; the *Beck Depression Inventory-II* (BDI-II; Beck, Steer & Brown, 1996), a tool developed for assessing depressive symptomatology by asking respondents to endorse 21 sets of statements; the *Childhood Anxiety Sensitivity Index* (CASI; Silverman et al., 1999), a 18-item scale designed to assess children's fear of different anxiety symptoms; the *Children's Depression Inventory* (CDI; Kovacs, 1985), a 27-item self-report scale for the assessment of depressive symptoms in children; the *Generalized Anxiety Disorder Questionnaire-IV* (GADQ-IV; Newman et al., 2002), a 9-item questionnaire for self-report diagnostic assessment of generalized anxiety disorder and for evaluating the severity of generalized anxiety symptoms; the *Patient Health Questionnaire-9* (PHQ-9; Spitzer et al., 1999), consisting of 9 items to make a tentative diagnosis of depression in line with the DSM-IV criteria for major depression; the *Penn State Worry Questionnaire* (PSWQ; Meyer et al., 1990), that measures the tendency, intensity and uncontrollability of worry and consists of 16 items; the *Perseverative Thinking Questionnaire* (PTQ; Ehring et al., 2011), is a 15-item questionnaire assessing the tendency to engage in repetitive negative thinking independent of a disorder-specific content; the *Ruminative Response Scale* (RRS ; Nolen-Hoeksema & Morrow, 1991), consists of 22 items It assesses the tendency to respond to depressed mood with a focus on self, symptoms, and possible consequences and causes of this depressed mood; the *Revised Child Anxiety and Depressive Scales* (RCADS; Chorpita et al., 2000), a 47-item questionnaire designed to self-report symptoms of anxiety disorders and depression. In addition to the original 47-item version, there is also a 30-item version (Sandín et al., 2010); and the *Children Anxiety Scale* (SCAS; Spence, 1998), a 38-item self-report scale (plus six items assessing social desirability) designed to assess children's anxiety and providing information on childhood-specific anxiety disorders. The *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997), a measure of emotional and behavioral difficulties in children and adolescents. It consists of 25 items with Likert-type response format; the *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004), adapted for Spanish adolescents, is a 36-item measure of emotional regulation abilities, with six dimensions covering emotional responses; the *Willingness & Action Measure for Children and Adolescents* (WAM-C/A; Greco et al., 2004;) assesses psychological flexibility, focusing on acceptance of emotional experiences and actions towards important life goals; The Spanish version of the *Diagnostic Interview of Children and Adolescents-Revised* (DICA-R; Reich et al., 2000); The *Positive and Negative Affect Schedule* (PANAS; Joiner et al., 1996*)* is a scale used for assessing positive and negative affect

Procedures and techniques

The various treatments and studies reviewed employed a wide range of techniques and procedures aimed at addressing anxiety and depression.

Knapp et al., 2020, employed a two-part treatment for the reduction of anxiety and depressive symptoms. The first part comprised psychoeducation about the nature of anxiety and anxiety sensitivity, along with an experimenter-led individual exposure session of 10 repeated controlled breathing trials. The second part of the treatment involved parent-controlled exposures, conducted once a week for four sessions.

Balle and Tortella-Feliu (2010) conducted a treatment grounded in Cognitive Behavioural Therapy (CBT), which included psychoeducation, emotional regulation techniques, and gradual exposure to feared situations.

In the study by Kindt et al. (2014), a non-blind two-arm parallel group clustered randomized controlled trial was utilized to test the effectiveness of the *Op Volle Kracht* (OVK) program, compared to a control group. This program taught adolescents CBT-derived skills, as well as social problem-solving and coping skills. It involved various exercises in a workbook, group discussions, role-plays, and homework assignments.

The intervention by Topper et al. (2017), used psychoeducation, functional analysis, identification of warning signals, and planning alternative responses. Reflective/group discussion exercises, experiential exercises, behavioral activation, and behavioral experiments were also incorporated. This intervention aimed to facilitate a shift from dysfunctional thinking to a more useful and concrete thinking style and to increase approach behavior. The intervention was delivered both online and in-person, with identical content but different delivery formats.

Lastly, the study by Vivas-Fernandez et al. (2023), followed a 3-arm randomized controlled trial (RCT) that included an active control condition (ACC), PROCARE, and PROCARE+. PROCARE, an abbreviated adaptation of the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders in Adolescents (UP-A), applies evidence-based CBT strategies for emotional disorders. The aim was to promote change through improvements in emotional reactivity and regulation skills, enhance tolerance to distress associated with intense emotions, and reduce or eliminate maladaptive emotional behaviours. PROCARE+ expands on PROCARE by adding tailored modules according to the specific risk factors identified in each adolescent. The ACC arm of the study consisted of an 8-week abbreviated adaptation of Utalk, an intervention designed for adolescents at risk for social anxiety and/or depression. It is based on emotional psychoeducation in a group format, emphasizing discussion of thoughts, feelings, and behaviours as part of emotions, and providing support around generally distressing events.

Review of intervention characteristics and results

There is a notable diversity in the intervention characteristics across the reviewed studies.

On one hand, the treatment in the study by Knapp et al., (2020) was conducted individually in a family setting, with one supervised exposure per week, totaling up to four exposures. However, it was observed that there was a lack of specificity regarding the concrete characteristics of this treatment. The study involved two follow-up sessions, the first coming two weeks after treatment and the second arriving a month post-treatment. This study found that levels of anxiety sensitivity were significantly lower at the one-month follow-up compared to the control group, with a 23% reduction in the intervention group and 14% reduction in the control group. However, no such differences were found immediately after the intervention or at the two-week follow-up. Furthermore, significant indirect effects on anxiety and depression symptoms were observed one month post-treatment, but no significant direct effects were identified.

On the other hand, the study by Balle & Tortella-Feliu (2010) involved a group intervention carried out in a school setting, with groups of 10-12 participants meeting twice a week for up to six sessions. It had a follow-up six months post-treatment. This study did not find any significant differences between the prevention and control groups in the immediate post-intervention evaluation. Reductions in the measured variables were observed in both groups, which couldn't be attributed solely to the program's effects. Nevertheless, at the six-month follow-up, significant differences did emerge in the reduction of anxiety sensitivity. These reductions were small to moderate for anxiety sensitivity symptoms and anxiety symptoms, while no significant reductions were observed for depressive symptoms.

Similarly, the study by Kindt et al. (2014) also took place in a school setting, but this intervention consisted of 16 weekly sessions. The intervention, which had two follow-ups, one six months post-treatment and another a year after the intervention, reported results that contrasted with initial expectations. The OVK program did not demonstrate a significant effect on reducing depressive symptoms a year after the intervention. Interestingly, an iatrogenic effect was observed, with clinical depressive symptoms showing an increase after a year of follow-up.

Contrastingly, the study by Topper et al. (2017) was conducted outside of the school environment, consisting of six weekly sessions. The study, which also had two follow-ups, three months and twelve months post-treatment, found both versions of the preventive intervention to be effective in reducing repetitive negative thinking (RNT) and symptoms of anxiety, depression, and general distress. These reductions were maintained over time, and no significant differences were found in symptom reduction between the group-based and online RFCBT interventions.

Finally, the study by Vivas-Fernandez et al. (2023) was also conducted outside of the school setting, with eight weekly sessions, and additional sessions designed to intervene on the risk factors identified in the adolescents. The treatments, with two follow-ups, six months and a year post-treatment, showed that the PROCARE+ intervention was effective in reducing emotional symptoms post-intervention and at both follow-ups. This was observed in comparison to a control group and an alternative intervention that did not include additional sessions focused on risk factors.

Discussion

The aim of this study was to conduct a systematic review of existing research articles focusing on selective prevention treatments for anxiety and depression in adolescents. Along these lines, only five studies conducted between 2010 and 2023 were found that assessed selective prevention psychological treatments for anxiety and depression in adolescents. The findings of this review provide important insights into the current state of knowledge in this area. However, it is important to acknowledge the scarcity of studies focusing on selective prevention interventions targeting emotional disorders in adolescents. This observation

aligns with the insights of Ghandour et al. (2019) and Stockings et al. (2016), who emphasized the impact and need for targeted interventions in this population. There is a clear need for more research to fill this gap and to develop evidence-based protocols that effectively address the risk factors associated with anxiety and depression in adolescents.

Among the reviewed studies, several positive discoveries were made. Particularly noteworthy are the studies conducted by Vivas-Fernandez et al. (2023) and Topper et al. (2017). Vivas-Fernandez et al. (2023) demonstrated promising results in reducing emotional symptoms and promoting protective factors among emotionally vulnerable adolescents. Topper et al. (2017) found that their preventive intervention effectively reduced repetitive negative thinking and symptoms of anxiety, depression, and general distress. It is important to consider that their study included both adolescents and young adults, which may have influenced the results. Therefore, it is recommended that future research specifically focus on either adolescents or adults to draw more precise conclusions. These studies contribute to the growing body of evidence supporting the effectiveness of selective prevention interventions in improving emotional well-being among adolescents (Gearing et al., 2013; Stockings et al., 2016; Vivas-Fernandez et al., 2023).

In the studies reviewed, there is a tendency to assess anxiety and depression as independent phenomena. However, the majority of studies included in this systematic review focused primarily on the treatment of anxiety symptoms, with indirect improvements observed in depressive symptoms as well. Interestingly, the study conducted by Vivas-Fernandez et al. (2023) stands out as the only one that specifically targets selective prevention treatment from a transdiagnostic perspective. The transdiagnostic approach of CBT programs, which target core mechanisms common to emotional disorders, has demonstrated effectiveness in community and primary care settings, providing cost-saving benefits compared to disorder-specific interventions (Bullis et al., 2019; Ehrenreich-May et al., 2018; Ehrenreich-May & Kennedy, 2021; Norton et al., 2021; Meidlinger & Hope, 2017; Sandín et al., 2012; Cano-Vindel et al., 2021; Roberge et al., 2020; Barlow et al., 2017; Newby & McKinnon, 2019).

The results of the research studies have shown significant improvements in measures of emotional symptoms, with the most pronounced results reported in the medium-term follow-up assessments. This is consistent with findings from various studies, which indicate sustained benefits from cognitive-behavioural treatments, especially after follow-up assessments that occur post-booster sessions conducted sometime after the main treatment concludes (Bathgate et al., 2022; Gearing et al., 2013; Giovannetti et al., 2021; Sun et al., 2019). Among the articles reviewed, follow-up assessments revealed positive outcomes; however, only the study by Vivas-Fernandez et al. (2023) included post-treatment booster sessions.

Conclusions

Based on the results, it can be concluded that moderate improvements have been observed in participants undergoing programs that utilize Cognitive Behavioural Therapy. The research indicates a positive effect, especially when treatments adopt a transdiagnostic approach, such as the PROCARE protocol, a transdiagnostic selective prevention treatment for adolescents at risk of developing emotional disorders. Such approaches have shown promising outcomes, even in the long term. However, due to the variability and limitations of the studies analyzed, as well as the limited literature available, drawing definitive conclusions remains challenging. Researchers and readers should approach these results with caution, taking into account potential risks of bias that might affect the quality and integrity of the studies

This study has some limitations. Firstly, there may be a lack of data in the databases consulted, meaning that studies published in other electronic resources could have been overlooked. Additionally, the term "selective prevention" might not be mentioned in some studies, even if their methodology would categorize them under this type of prevention. This could be due to omission or because they adopted a different classification than the one presented in this study.

For future research, there's a need to expand on psychological treatments targeting selective populations, especially the youth, ensuring these are grounded in evidence-based practices. Given the significant comorbidity between anxiety and depression, delving deeper into a transdiagnostic perspective is imperative. Such an approach recognizes and addresses the shared traits of these disorders rather than viewing them as separate entities. Emphasizing this transdiagnostic perspective, in line with findings from interventions like the PROCARE protocol, can provide a more comprehensive understanding. Finally, it's essential to incorporate medium to long-term follow-up sessions to ensure the sustainability of emotional improvements.

Conflict of interest

The authors of this work declare that there is no conflict of interest.

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