Problem-solving interventions and depression among adolescents and young adults: A systematic review of the effectiveness of problem-solving interventions in preventing or treating depression among 13-25 year olds

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ABSTRACT

Background: Problem-solving (PS) has been identified as a common element in multiple evidence-based treatments for the prevention and treatment of depression. We undertook a systematic review of evidence for the effectiveness and implementation of PS for the prevention and treatment of depression among 13-25 year olds.

Methods: We searched electronic databases (*PsycInfo, Medline, and Cochrane Library*) for studies published between 2000 and 2020 described by authors as a PS intervention or including PS approaches to treat or prevent depression in 13-25 year olds. Eighteen out of 902 effectiveness studies and 1 out of 480 implementation studies met inclusion criteria.

Results: The interventions studied were heterogeneous in population, intervention, modality, comparison condition, study design, and outcome. Eight¹ focused purely on PS; eight used PS as part of a wider intervention. Six studies found positive effects in reducing depression, and two in reducing suicidality. Seven measured effects on PS skills. There was little evidence of

¹ Addressed in ten studies

change in PS skills, about PS skills as mediator or moderator of effects on depression, or about the fit, feasibility, or acceptability of PS interventions.

Discussion: There is mixed evidence about the effectiveness of PS as treatment and prevention of depression among AYAs although our findings suggest it can work in a wide range of contexts and forms. Possible explanations for limited effectiveness are: not all studies included populations where depression was known to be present; variability in quality, dosage and fidelity monitoring; small samples size and short follow-up periods.

1. INTRODUCTION

Depression among adolescents and young adults is a serious, prevalent problem. A striking increase is seen in early adolescence (Dietz, Silk, & Amole, 2019): rates of depression almost double between the age of 13 (8.4%) and 18 (15.4%) (Merikangas et al., 2010), and are highest for adolescents and young adults (AYA; 20-30%) in low- and middle-income countries (LMIC). A lasting gender gap starts at age 13, with females twice as likely to be diagnosed with a depressive disorder (Merikangas, Nakamura, & Kessler, 2009). Research also suggests that the mean age of onset for depressive disorders is decreasing and prevalence increasing for AYA.

Depressive episodes for AYA tend to recur and carry into adulthood. Twenty-six percent of adolescents relapse within a year after a depressive episode (Kovacs, Feinberg, Crouse-Novak, Paulauskas, & Finkelstein, 1984; Lewinsohn et al., 1993) and adolescents experiencing depression are six times more likely to experience episode as an adult (Avenevoli, Knight, Kessler, & Merikangas, 2008; Zisook et al., 2007). Depressive episodes are associated with significant impairment in academic performance, social problems, higher risk of comorbid disorders, and increased rates of suicide (Angold & Costello, 2001; Bridge et al., 2008; Puig-Antich et al., 1993; Rohde, Lewinsohn, & Seeley, 1991). Overall, the persistent course, significant impairment, and increased mortality make depression the third leading cause of disability worldwide (Smith, 2014).

Psychosocial interventions, such as cognitive-behavioural therapy (CBT) and interpersonal therapy (IPT), have shown promise in preventing and treating depression (Stice et al., 2009; Weersing et al., 2017). However, meta-analyses indicate that effect sizes for depression treatments are small to moderate for adolescents (Weisz et al., 2019) and adults (Johnsen & Friberg, 2015). A similar picture is seen for prevention programmes (Stice et al., 2009).

Up to half of adolescents with depression do not receive treatment (Merikangas et al., 2011), and this rate approaches 90% in LMIC (Chisholm et al., 2016; Demyttenaere et al., 2004; Saxena et al., 2007). The limited number of AYA receiving treatment, questionable quality of community services, and limited impact of evidence-based treatments (EBTs) suggest that the mental health service system may not be adequately serving individuals with depression.

New strategies are needed to improve accessibility and effectiveness. One strategy is to move away from an emphasis on EBTs (e.g. CBT) to a focus on discrete treatment techniques that demonstrate positive effects across multiple studies that meet certain methodological standards (Chorpita & Daleiden, 2009). This has the potential to reduce implementation costs and improve sustainment (Hogue et al., 2017), is scalable to LMIC (Chibanda et al., 2011; Eskin, Ertikin, & Demir, 2008; Perera & Kathriarchchi, 2011), community delivery (Biggam & Power, 2002; Spence et al., 2003), and is culturally adaptable.

One potential common element for depression is problem solving (PS). PS trains individual to handle daily stressors, and commonly includes problem identification, problem definition, and the development, evaluation, selection and implementation of solutions. The specification of steps and intensity varies: most common manuals have from four (D’Zurilla and Goldfried, 1971) to seven or more steps (D’Zurilla and Nezu, 2007), with international manuals such as CETA (Murray et al., 2014) having seven steps (with several sub-steps) – see Box 1. It is operationalised in manualized treatments (D’Zurilla & Nezu, 2007; Spence et al., 2003) and is identified as a common element in multiple prevention (Boustani et al., 2015; Spence, Sheffield, & Donovan, 2003) and treatment (Bell & D’Zurilla, 2009; Malouf, Thorsteinsson, & Schutte, 2006) programmes for depression and other mental health conditions (Chorpita & Daleiden, 2009; Skeen et al., 2019; Weisz et al., 2017), and thus has transdiagnostic value.

The relationship between PS and depression is complex (Speckens & Hawton, 2005) and PS may play multiple roles in the association between stress and depression (Nezu 1987). PS may

moderate the effect of stress on depression (Fry & Goodman, 2000) and the effectiveness of treatment on depression and suicidality (Becker-Weidman et al., 2010). It may be the causal mechanism by which stress leads to depression or suicidality (Chang, 2002). It is also unclear whether it is PS orientation or PS skills and performance that is most relevant (Becker-Weidman et al., 2010).

Box 1: Operationalisation of PST in two example programmes

Programme	Problem Solving Therapy (D’Zurilla and Goldfried, 1971)	CETA (Common Elements Treatment Approach) (Murray et al., 2014)
Dosage and coverage	May involve 8-16 sessions, focusing on problem solving	May involve 8-12 sessions covering relaxation, cognitive coping, exposure-trauma memories, exposure-live, cognitive restructuring, behavioural activation and problem solving
Key elements	<ul style="list-style-type: none"> • Problem orientation: seeing problems as a challenge and solvable • Problem-solving skills <ul style="list-style-type: none"> - Problem definition and formulation - Generation of alternative solutions - Decision making - Solution verification: 	<ul style="list-style-type: none"> • Identify the problem • Identify a goal • Brainstorm solutions • Evaluate solutions • Choose a solution • Develop an action plan (including identifying challenges) • Test and review

This review is, to our knowledge, the first systematic review of PS interventions for AYA.

2. YOUNG PEOPLE AND PRACTITIONERS CONVERSATIONS

To contextualise the review, we held conversations with AYA (n=14) and practitioners providing mental health and psychosocial support (MHPSS) to AYA (n=10) in the United States, United Kingdom, Singapore, Mexico, Myanmar, Lebanon, Ukraine, and Zambia. Conversations were voluntary and facilitated by local staff following guidelines.

Conversations indicated that depression in AYA looks similar across cultures. Onset was typically within early to mid-adolescence (age 10-15), but external factors (e.g., family, peer, financial problems) determined when symptoms were at their “worst”. Several AYA described difficult transitions (e.g. starting college) as stressors that increased depressive symptoms, and practitioners and AYA in LMIC noted the role of previous or ongoing adverse experiences and traumatic events. To cope, AYA reported using distraction (e.g. “keeping busy”), high energy activities (e.g. working out), or engaging in enjoyable activities (e.g. music). Females and AYA

from the US and UK also talked to others for support, but the majority of AYA had not sought professional counselling.

Practitioners reported using PS for prevention and treatment. Prevention typically involved a single PS session focused on immediate stressors; treatment typically involved 1-2 PS sessions within a larger treatment. Practitioners reported that PS was helpful for specific, solvable problems (e.g. academic problem), but not for “unsolvable” problems (e.g. getting asylum status). AYA consistently mentioned needing to address “the problems” causing the symptoms, including both stressors and beliefs informed by previous experiences (e.g. traumatic events).

Practitioners believed that teaching PS can help reduce stress, increase skills, and shift PS orientation and self-efficacy beliefs but does not meet the needs of all AYA with depression, noting the need to address comorbid symptoms (i.e., trauma, anxiety) as well as underlying cognitive processes.

Both practitioners and AYA noted the importance of individualised pathways to the development and presentation of depression. AYA reported that depression was poorly understood by their peers and society, reporting stigma as a barrier to treatment.

3. METHODS

Figure 1: Review approach

3.1 Scope of study

The review was focused by the question: “in which ways and in which contexts and for whom does PS appear to work, and why; and in which ways and in which contexts and for whom do they appear not to work, and why?”. The question was further defined in terms of Population, Intervention, Comparison, Outcomes and Study design (PICOS): “Among AYA aged 14-24 (P), is PS including interventions that contain PS (I) effective in decreasing depression symptoms (O)?”. Two searches were conducted, the first focused on effectiveness and the second on implementation.

3.2 Search 1 Strategy: Effectiveness of PS interventions

Initial searches were conducted using *PsycInfo*, *Medline*, and *Cochrane Library* with the following search terms: “problem solving”, “adolescent”, “youth”, and “depression” along with filters limiting results to controlled studies looking at effectiveness or exploring mechanisms of effectiveness. Synonyms and derivatives were employed to expand the search. We searched grey literature using *GreyLit.org* and *Opengrey.eu*, contacted experts in the field and authors of protocols, and searched the reference lists of all included studies,. The search was undertaken on 4th June 2020.

Inclusion and exclusion criteria

Studies were included if the intervention was described by authors as a PS intervention or including PS, used to treat or prevent depression among AYA aged 13-25² years, with depression outcomes reported. Literature in electronic format published post 2000 were deemed eligible, given the greater relevance of more recent usage of PS.

Studies reporting a mean or median age between 13-25 years were included. There was no exclusion for gender, ethnicity, or country setting; only English language texts were included.

We excluded studies of CBT, IPT, Acceptance and Commitment Therapy, Dialectical Behaviour Therapy, and modified forms of these treatments. These treatments include PS and have been shown to demonstrate small to medium effects for depression (Eckshtain et al, 2020; Stice et al., 2009; Weersing et al., 2017), but the unique contribution of PS cannot be disentangled.

² Although our primary interest was in 14-24 year olds, we widened our inclusion criterion by a year on either side to expand the number of eligible studies. This enabled us to include three studies that would otherwise have been excluded.

Randomised controlled trials (RCTs), quasi-experimental designs (QEDs), systematic reviews/meta-analyses, pilots, or other studies with clearly defined comparison condition (no treatment, treatment as usual (TAU), or a comparator treatment) were included³.

Studies were included if conducted in hospitals, health clinics and community-based clinics; schools, colleges and universities; out-of-home care settings, foster care and other social welfare settings; detention centres and juvenile justice settings; family settings, and disaster and conflict zones.

Study selection

All citations were entered into Endnote and uploaded to Covidence for screening and review against the inclusion/exclusion criteria. Two reviewers with high inter-rater reliability (98%) independently screened the title and abstract (SC, JM)⁴. Full text of articles that met criteria were screened by the two reviewers. Duplicates, irrelevant studies, and studies that did not meet criteria were removed and the reason for exclusion recorded. Discrepancies were resolved by the review team lead (JL).

Data Extraction

Data were extracted by 2 reviewers (SC, JM) to a form that included: (i) study characteristics (author, publication year, location, design, study aim), (ii) population (age, gender, race/ethnicity, education, family income, depression status), (iii) setting, (iv) intervention description (therapeutic or preventative, whether PS was provided alone or as part of a wider intervention, duration, delivery mode), (v) treatment outcomes (measures used and reported outcomes for depression, suicidality, and PS), (vi) fidelity/implementation outcomes.

RCTs were assessed for quality (i.e., confidence in the study's findings) using the Cochrane Risk of Bias 2.0 tool (Sterne et al., 2019), which includes assessment of potential risk of bias relating to the process of randomisation; deviations from the intended intervention/s; missing data; outcome measurement, and reported results. Risk of bias relating to each domain is estimated using an algorithm, grouped as: Low risk; Some Concerns; or High risk. Two

³ Study protocols, case studies, conference papers, book chapters, opinion pieces, and editorials were excluded.

⁴ If reviewers could not retrieve the full text, effort was made to contact the authors.

reviewers (SC, LB) assessed the quality of included studies and discrepancies were resolved by consensus.

Table 1 Individual risk of bias assessments using Cochrane RoB2 tool by domain (1-5) and overall (6)

Study (Author and year)	Domain 1. Randomisation process	Domain 2. Deviations from intended interventions	Domain 3. Missing outcome data	Domain 4. Measurement of outcome	Domain 5. Selection of the reported result	Domain 6. Overall risk of bias
Bird 2018	Low risk of bias	Some concerns	Some concerns	Some concerns	Some concerns	Some concerns
Brugha 2000	Low risk of bias	Some concerns	Low risk of bias	Some concerns	Some concerns	Some concerns
Chibanda 2014	Some concerns	Some concerns	Some concerns	High risk of bias	Some concerns	Some concerns
Dietz 2014	Some concerns	Some concerns	Low risk of bias	Low risk of bias	Some concerns	Some concerns
Eskin 2008	Some concerns	Some concerns	Some concerns	Some concerns	Some concerns	Some concerns
Fitzpatrick 2005	Some concerns	Some concerns	Low risk of bias	Some concerns	Some concerns	Some concerns
Gaffney 2014	High risk of bias	Some concerns	Low risk of bias	Some concerns	Some concerns	Some concerns
Gureje 2019	Low risk of bias	Some concerns	Low risk of bias	Low risk of bias	Some concerns	Some concerns
Haefel 2017	Some concerns	High risk of bias	High risk of bias	High risk of bias	Some concerns	High risk of bias
Hallford 2016	Low risk of bias	Low risk of bias	Some concerns	Some concerns	Some concerns	Some concerns
Hoek 2012	Low risk of bias	Some concerns	Low risk of bias	Some concerns	Some concerns	Some concerns
Hood 2018	Some concerns	Some concerns	Low risk of bias	Some concerns	Some concerns	Some concerns
Kolko 2000	Low risk of bias	Some concerns	Low risk of bias	High risk of bias	Some concerns	Some concerns
Makover 2019	Some concerns	Some concerns	Low risk of bias	Some concerns	Some concerns	Some concerns
Parker 2016	Low risk of bias	Some concerns	Some concerns	Low risk of bias	Some concerns	Some concerns
Xavier 2019	Low risk of bias	Low risk of bias	Low risk of bias	Low risk of bias	Low risk of bias	Low risk of bias

Figure 2: Risk of bias summaries (n=16)

A narrative synthesis was undertaken given the high level of heterogeneity in population, intervention, comparison condition, outcome, and study design.

3.3 Search 2 strategy – Implementation of PS interventions

Our second search focused on implementation of PS interventions. The Search 1 strategy was used, but with filters for qualitative and process studies (e.g., “qualitative”, “ethnology”, “phenomenology”, “lived experience”, “survey”, “focus group”, and “process evaluation”). Search 2 was undertaken on 20th July 2020.

Studies were included if they reported on implementation outcomes including feasibility, acceptability, fidelity, and adaptability. Citations were entered into Endnote and Excel for screening and review against inclusion criteria. No risk of bias assessments were conducted.

4 RESULTS

4.1 Effectiveness of PS interventions

974 references were identified; 169 were removed as duplicates and 635 excluded during screening. The full text of the remaining 170 was screened. 152 were excluded leaving 18 studies (see PRISMA diagram Figure 3).

Figure 3: PRISMA diagram for Search 1 – effectiveness of PS interventions

Table 3 presents key characteristics of included studies. Across the 18 studies, 16 interventions were described.

Table 3: Reviewed studies – effectiveness of PS interventions

No.	STUDY DETAILS	INTERVENTION PURPOSE	INTERVENTION CHARACTERISTICS	STUDY DESIGN	CONTROL TREATMENT	STUDY POPULATION	OUTCOMES RELATIVE TO CONTROL AND MEASURE
PROBLEM SOLVING AS STANDALONE TREATMENT							
1	Bird et al., 2018 UK	Therapeutic Problem-related distress	MYLO: Online, individual problem-solving program based on PCT principles Duration could be as long as participants chose (minimum 15 minutes) Coverage of PST steps unclear	RCT N=213	ELIZA text-based programme emulating Rogerian psychotherapist	University students No inclusion criteria for depression	No significant change in depression (DASS-21) No significant change in problem-solving (study-developed rating)
2	Chibanda et al., 2014 Zimbabwe	Therapeutic Postnatal depression	PST: Group, face-to-face PST intervention 2 sessions per week for 6 weeks delivered by trained peer counsellors Based on Mynors-Wallis (2005) All/most PST steps covered	RCT N=58	Amitriptyline (antidepressant) and peer education	Women attending primary care clinics Met criteria for post-partum depression (DSM-IV)	Significant reduction in postnatal depression (EPDS)
3	Eskin et al., 2008 Turkey	Therapeutic Depression	PST: Individual, face-to-face PST intervention 6 weekly sessions delivered by graduate clinical psychology students Based on D'Zurilla and Goldfried (1971) and D'Zurilla and Nezu (1999) All/most PST steps covered	RCT N=46	WLC	High school and university students Diagnosed with MDD (SCIV)	Significant reduction in depression (BDI; HDRS) and suicide risk (SPS) No significant change in problem-solving skills (PSI)
4	Fitzpatrick et al., 2005 US	Therapeutic Suicidal ideation	Problem-orientation intervention: 35-minute video delivered individually and face-to-face focusing on problem-solving and coping styles One session with 2 modules to be completed Targeted problem orientation only; covered 4 steps of PST	RCT N=110	Single session video covering health issues inc. diet exercise and sleep	University students With suicidal ideation (≥ 6 BSS or endorsing active ideation)	Significant reduction in depression (BDI) Reduction in suicidal orientation not sustained (BSS). No significant change in problem-solving skills or orientation SPSI-R
5	Gaffney et al., 2014 UK	Therapeutic Problem-related distress	MYLO: Online, individual problem-solving program based on PCT principles Duration could be as long as participants chose (average time was 19.23 minutes) Coverage of PST steps unclear	Pilot RCT N=48	ELIZA text-based programme emulating Rogerian psychotherapist	University students No inclusion criteria for depression	No significant change in depression (DASS-21) No significant change in problem-solving (study-developed rating)
6	Hoek et al., 2012 Netherlands	Preventive Depression	PST: Individual, online PST intervention 5 weekly sessions completed online with progress reviewed by mental health care professionals All/most PST steps covered	RCT N=45	WLC	Recruitment through community and via parents treated for depression and anxiety Self-report of mild or moderate depression and anxiety. Excluded severe depression (>40 on CES-D).	No significant change in depression (CES-D)
7	Parker et al., 2016 Australia	Therapeutic Depression	PST: Face-to-face PST intervention. Not specified whether group or individual. 6 weekly sessions delivered by research psychologists Based on Mynors-Wallis (2005) All/most PST steps covered	RCT N=176	Control treatment based on general counselling principles informed by NICE guidelines for mild to moderate depression	Young people recruited from youth mental health services Elevated symptoms not specific to depression indicating a mild disorder (K10 score ≥ 20)	No significant change in depression (BDI)
8	Tezel & Gözümlü, 2005 Turkey	Therapeutic Postnatal depression	PST: Individual, face-to-face PST intervention 6 weekly sessions delivered by the nurse researcher All/most PST steps covered	QED N=62	Nursing intervention	Mothers visiting postnatal care service At risk of post-partum depression (>11 EPDS) but without major depressive symptoms	No significant change in depression (BDI)
9	Xavier et al., 2019 Brazil	Preventive Suicidal behaviour	PST: Group, face-to-face PST intervention 5 weekly sessions delivered by experienced psychologist Based on D'Zurilla and Nezu (2007) and Vazquez et al. (2015) All/most PST steps covered	RCT N=100	TAU	Poorly performing students recruited from 3 public schools Met criteria for depression (≥ 16 CES-D) and high risk of suicide (score total ≥ 45 or critical item score ≥ 3 on ISO-30) but not major depression	Significant reduction in depression (CES-D) and suicidal orientation (ISO-30) Significant improvement in problem-solving (SPSI-R)

No.	STUDY DETAILS	INTERVENTION PURPOSE	INTERVENTION CHARACTERISTICS	STUDY DESIGN	CONTROL TREATMENT	STUDY POPULATION	OUTCOMES RELATIVE TO CONTROL AND MEASURE
PROBLEM-SOLVING AS PART OF WIDER INTERVENTION							
10	Brugha et al., 2000 UK	Preventive Postnatal depression	Preparing for Parenthood: Group, face-to-face cognitive, problem-solving and social support intervention 6 weekly sessions delivered by nurses and occupational therapists Coverage of PST steps unclear	RCT N=292	TAU	Mothers attending antenatal clinics Increased risk of post-natal depression (1+ items on modified GHQ)	No significant change in postnatal depression (EPDS; GHQ-D)
11	Dietz et al., 2014 US	Therapeutic Depression	Systemic-behavioural Family Therapy (SBFT) (family-based, face-to-face) aimed to treat family dysfunction and teach problem-solving skills to families. Phase 1 involved 12-16 weekly sessions, phase 2 involved 2-4 booster sessions. Delivered by trained therapists Coverage of PST steps unclear	RCT N=63	CBT or NST	Patients recruited from 2 mental health clinics Met DSM criteria for MDD (≥ 13 BDI)	No significant improvement in depression (DEP-13 and BDI). CBT and SFBT associated with increased problem solving (video rating). Problem solving mediated the association between CBT (but not SFBT) and remission from depression.
12	Gureje et al., 2019 Nigeria	Therapeutic Perinatal depression	Individual, face-to-face problem-solving intervention adapted from PST-PC. 8 initial weekly sessions, followed by 4 fortnightly sessions, third stage with option of pharmacotherapy/specialist referral for patients with higher EPD scores Delivered by primary maternal care providers Coverage of PST steps unclear	RCT N=686	Enhanced care as usual including psycho-education and social support	Mothers attending childcare clinics Met criteria for major depression (≥ 12 EPDS)	Significant reduction in depression symptoms but not in remission rate c (EPDS). Significant increase in remission rate for subgroup of women with more severe baseline depression compared to control.
13	Haefel et al., 2017 US	Therapeutic Depression	Social Problem-Solving Therapy: Group, face-to-face intervention designed to increase social problem-solving and social skills 10 sessions delivered by trained correctional officers Covered most PST steps except testing solution	RCT N=296	TAU – psychosocial support	Juvenile detainees in state-run detention centres No inclusion criteria for depression	No significant change in depression compared to control (CDI). Significant reduction in depression for sub-group with higher intelligence. Significant increase in depression for participants with lower intelligence.
14	Hallford & Mellor, 2016 Australia	Therapeutic Depression	Cognitive Reminiscence Therapy: Individual, face-to-face cognitive therapy that included brief PST 6 weekly sessions delivered by registered provisional psychologist Coverage of PST steps unclear	RCT N=26	Brief evidence-based treatment	Young people recruited from a community youth mental health service At least moderate depression (score ≥ 7 on DASS-21)	No significant reduction in depression (DASS-21)
15	Hood et al., 2018 US	Preventive Diabetes distress	Penn Resilience Program Type 1 Diabetes: Group, face-to-face resilience enhancing intervention with a focus on diabetes management. Teaches cognitive-behavioural, social and problem-solving skills. 9 bi-weekly sessions delivered by masters-level clinicians Coverage of PST steps unclear	RCT N=264	Diabetes educational intervention	Patients from diabetes clinics No inclusion criteria for depression - excluded with depression diagnosis or treatment	No significant reduction in depression (CDI) No significant improvement in problem-solving (SRSI-R)
16	Kolko et al. (2000)	Therapeutic Depression	Systemic-behavioural Family Therapy (family-based, face-to-face) aimed to treat family dysfunction and teach problem-solving skills to families. Phase 1 involved 12-16 weekly sessions, phase 2 involved 2-4 booster sessions. Delivered by trained therapists Coverage of PST steps unclear	RCT N=107	CBT or NST	Patients recruited from 2 mental health clinics Met DSM criteria for MDD (≥ 13 BDI)	No significant reduction in depression (DEP-13 and BDI)
17	Makover et al., 2019 US	Preventive Depression	High School Transition Program: Group and individual, face-to-face intervention designed to increase social and academic problem-solving skills. 12 group sessions followed by 4 individual booster sessions delivered by trained mental health counsellors. Combined depression and transition programmes Coverage of PST steps unclear	RCT N=497	Interview and clinical follow-up without active therapy	Middle and high school students Met criteria for depression ((score ≥ 15 on MFQ)	Significant reduction in depression (MFQ)
18	Noh, 2018 South Korea	Preventive Build resilience and reduce impact of trauma	Resilience enhancement program: Group, face-to-face intervention designed to increase resilience with a component on problem-solving 2 sessions per week for 4 weeks delivered by the author and a psychiatric nurse Coverage of PST steps unclear	QED N=32	TAU by youth shelters	Runaway youths from homeless shelters No inclusion criteria for depression - excluded young people receiving psychiatric interventions	No significant reduction in depression (BDI)
Notes: Depression measures: BDI=Beck Depression Inventory; BSS=Beck Suicide Scale; CES-D=Centre for Epidemiological Studies Depression Scale; DASS-21=Depression Anxiety Stress Scale-21; DEP13=13 items from Schedule for Affective Disorders and Schizophrenia for School-Age Children; EPDS=Edinburgh Postnatal Depression Scale; GHQ-D=General Health Questionnaire Depression Scale; HDRS=Hamilton Depression Rating Scale; ISO=Inventory of Suicide Orientation MFQ=Mood and Feelings Questionnaire; SCIV=Structured Clinical Interview Clinical Version for DSM-IV Axis 1 SPS=Suicide Probability Scale Problem-solving measures: PSI=Problem Solving Inventory; SPSP-R=Social Problem-Solving Inventory-Revised. TAU=treatment as usual; WLC=Waitlist Control							

4.1.2 Overview of studies

Intervention characteristics

Eight interventions focused purely on PS, six covering five to seven steps of PS Therapy (PST) with each step described in detail⁵. Three were adaptations of models proposed by D’Zurilla and Nezu (1999, 2007) and D’Zurilla and Goldfried (1971), two were based on Mynors-Wallis (2005)’s PST guide and one did not specify a model. A problem-orientation video intervention adapted from D’Zurilla and Nezu (1999), focused on the first four steps of PST. The last purely PS intervention was an online intervention adapted from Method of Levels therapy.

Eight interventions used PS as part of a wider intervention (e.g. cognitive therapy, social support and skills, and resilience enhancement). How, and to what extent, PS skills were covered in these interventions was unclear.

Ten were described as therapeutic interventions and six as preventive. Seven studies referred to the intervention having been developed or adapted for young people.

Modality

Seven interventions were delivered individually, six were group-based, one was family-based, one was mixed, and in one the format of delivery was unclear. Thirteen were delivered face-to-face and three online. Dosage ranged from a single session to 16 weekly sessions plus 4 booster sessions: the mode was once per week for 6 weeks (N=5).

Study settings and populations

Thirteen studies were conducted in high-income countries (UK, US, Australia, Netherlands, South Korea), three in upper-middle income (Brazil, Turkey), and two in lower-middle income countries (Zimbabwe, Nigeria).

Two studies included participants younger than 13 and three older than 25. Six studies were conducted on university or high school student populations and four on pregnant or post-partum mothers. The remaining eight used populations from mental health clinics, the community, a diabetes clinic, juvenile detention, and a runaway shelter.

⁵ Based on the CETA seven steps shown in Box 1 which reflect common steps across model

Twelve studies included participants who met the criteria for a depressive or suicidal disorder, (two of these excluded severe depression). Six studies did not use depression symptoms in the inclusion criteria (one of these excluded depression).

Several studies excluded other significant mental health conditions.

Study designs

Sixteen studies were RCTs; two were QEDs. Seven had TAU or wait-list control (WLC) comparator groups, 11 used active control groups (e.g., alternative treatment). Eight studies described fidelity measures. Sample size ranged from 26 to 686 and was under 63 in eight studies.

Risk of bias concerns were moderate and a fair degree of confidence in the validity of study findings is warranted. The majority of studies (88%) were assessed as 'some concerns' (N=14), one study (9⁶) was 'low risk', and one (13) 'high risk'. The most frequent areas of concern was selection of the reported result (n=15, mostly due to inadequate reporting of a priori analytic plans); deviations from the intended intervention (N=14), mostly related to insufficient information about intention-to-treat analyses); and measurement of outcome (N=12).

Outcome measures

Seven interventions targeted depression, four post/perinatal depression, two suicidal ideation, one 'problem-related distress', one 'diabetes distress', and one resilience. Those targeting post/perinatal depression used the Edinburgh Postnatal Depression Scale as the outcome measure. Of the others, six used the Beck Depression Inventory, two the Children's Depression Inventory, three the Depression Anxiety Stress Scale-21, two the Centre for Epidemiologic Studies Depression Scale, one the Short Mood and Feelings Questionnaire, one the Hamilton Depression Rating Scale, and one the depression subscale on the Schedule for Affective Disorders and Schizophrenia for School-Age Children.

Only seven studies measured PS skills or orientation outcomes. Three used the Social Problem-Solving Inventory-Revised, one the Problem Solving Inventory, two measured the

⁶ Numbers refer to the numbered studies in Table 3

extent to which the nominated problem had been resolved, and one observed PS in video-taped interactions.

4.1.2 Outcomes

The mixed findings regarding the effectiveness of PS for depression may depend on whether substantial depression is observed among study participants prior to treatment. Outcomes are therefore grouped by outcome, severity of clinical features, and comparator treatment. Within these groupings studies with lower risk of bias (RCTs) are presented first.

Reduction in depression symptoms

AYA meeting criteria for depressive disorder - compared to no treatment

A small but high quality (low-risk of bias) study (9) focused on preventing suicidal risk among school students in Brazil (RCT, N=100, low risk of bias), where treatment covered all/most PST steps, found a significant, moderate reduction in depression symptoms for the treatment group post-intervention, fairly well-maintained at 1-month, 3-month and 6-month follow-up.

A study (3) of an intervention for depression and suicidal proneness among high school and university students in Turkey (RCT, N=46, moderate risk of bias), covering all/most PST steps, found large effect sizes on post-treatment depression scores for intervention participants post-treatment compared with WLC; improvements were maintained at 12-months follow-up.

The High School Transition Program (17) in the US (RCT, N=497, moderate risk of bias) aimed to prevent depression, anxiety, and school problems in youth at the transition to high school; coverage of PST steps was unclear. There was a small reduction in the percentage of intervention students with clinical depression compared to the control group at the 18-month study period, however this difference was marginally significant.

However, an online PS intervention delivered to young people in the Netherlands (6) to prevent depression (RCT, N=45, moderate risk of bias), covering all/most PST steps, found no significant difference in depression level at 3 and 5 weeks and 4 months post-treatment.

AYA meeting criteria for depressive disorder - compared to active control

A problem-orientation intervention covering four PST steps and involving a single session video for US university students (4) (RCT, n=110, moderate risk of bias), compared with a video covering other health issues, resulted in a moderate reduction in depression post-treatment. While an overall reduction was seen compared to baseline, depression scores did not continue to decline at 2 weeks and 1 month follow up.

Cognitive Reminiscence Therapy which involved recollection of past PS experiences and drew on PS techniques (14) used for 12-25 year olds in community mental health services in Australia (a small, RCT (N=26) with moderate risk of bias) did not reduce depression symptoms compared with a brief evidence-based treatment at one or three months follow-up.

Two US studies (11, 16) used a three-arm trial to compare Systemic-behavioural Family Therapy (SBFT) with elements of PS, to CBT and individual Non-directive Supportive therapy (NST) (RCT, N=107, moderate risk of bias). There were no significant differences in depression between CBT, SBFT and NST at two-year follow-up

AYA meeting criteria for perinatal depression - compared to no treatment

A preventive manualised programme for postnatal depression that included PS approaches (coverage of PST steps unclear) tested in the UK (10), found no significant differences in depression scores at three months post-partum (RCT, N=292, moderate risk of bias).

AYA meeting criteria for perinatal depression - compared to active control

Three further studies of perinatal depression used an active control group. An intervention among women in Zimbabwe (2) (RCT, N=58, moderate risk of bias) covering all/most PST steps and found a larger decrease in Edinburgh Postnatal Depression Scale score for the intervention group compared to control (who received the antidepressant amitriptyline and peer education) at 6 weeks post-treatment.

A PS intervention tested in maternal and child clinics in Nigeria (coverage of PST steps unclear) (12) RCT (N=686, moderate risk of bias) compared with enhanced TAU involving psychosocial and social support, found no significant difference in the proportion of women who recovered from depression at six months post-partum, although there was a small difference in depression scores in favour of PS averaged across the 3, 6, 9, and 12 month follow-up points.

A study in Turkey (8) used a non-equivalent control group design to test a nursing intervention against a PS control intervention (covering all/most PST steps). This was a QED (N=62). Both groups showed a reduction in depression, but the nursing care intervention demonstrated a larger decrease post-intervention than the PS control intervention.

AYA without criteria for depressive disorder - compared to non-active control

A study of a social PS intervention (13) (which appeared to cover all PS steps with the possible exception of testing strategies) among juveniles in state-run detention centres in the US found no impacts (RCT, N=296, high risk of bias).

A QED (N=32) was used to test the effectiveness of a resilience enhancement and prevention intervention for runaway youth in South Korea (18) (coverage of PST steps unclear). There was a moderate decrease in depression for the intervention group compared with the control group during the one-month intervention period, but the difference was not sustained at one-month follow-up (BDI).

AYA without criteria for depressive disorder - compared to active control

A 2x2 factorial RCT (7) (N=176, moderate risk of bias) tested PST (covering all/most PST steps) among youth mental health service users with mild mental disorder in Australia was not superior to supportive counselling at two weeks post-treatment.

An adaptation of the Penn Resilience Program for young people with diabetes (15) (RCT, N=264, moderate risk of bias; coverage of PST steps unclear) showed a moderate reduction in diabetes distress but not depression at 4, 8, 12 and 16 months follow-up compared to a diabetes education intervention.

Similarly, no differences were found between groups at two weeks follow-up when the online Manage Your Life Online (coverage of PST steps unclear) was compared with an online programme emulating Rogerian psychotherapy for UK university students with problem-related distress (1) (RCT, N=213, moderate risk of bias); (5) (RCT, N=48, moderate risk of bias).

Reduction in suicidality

Three studies measured reduction in suicidality. A preventive treatment (9) found a large reduction in suicidal orientation in the PS group compared to control post-treatment; while suicidal ideation scores were inconsistent at 1-,3- and 6- month follow-up they maintained an overall lower score. In a PST intervention (3), post-treatment suicide risk scores were lower than pre-treatment for the PST group, but unchanged for the control group. An online treatment (4) found a moderate decline in ideation for the intervention group at post-treatment compared to control, not sustained at one-month follow-up.

4.1.3 Mediators and moderators

PS abilities and orientation

Seven studies measured PS skills or effectiveness. In two (3, 4), despite the interventions reducing depression, there was no change in PS abilities. One (9) found that change in global and functional PS skills mediated the relationship between the intervention group and change in suicidal orientation, but this was not assessed for depression. Three other studies (1, 5, 15) found no change in depression symptoms or PS skills. Finally, CBT and SBFT (11) led to significant increases in PS behaviour and PS was associated with higher rates of remission across treatments, but did not moderate the relationship between SBFT and remission status.

Other pathways, mediators, and moderators

A high-intensity intervention for perinatal depression in Nigeria had no treatment effect on the whole sample but was significantly effective for participants who had more severe depression at baseline (12).

A PS intervention among juvenile detainees in the US (13) was effective at reducing depression for participants with higher levels of fluid intelligence, but symptoms increased for those with lower levels, the authors suggest because they may have been less able to cope with exploring negative emotions and to apply the skills learned.

4.2 Implementation of PS interventions

The search identified 480 references. 41 further were identified through other sources. Three duplicates were removed and 454 excluded in screening. Full text screening of the remaining 64 identified only one eligible study (see Figure 4 for PRISMA diagram).

Figure 4: PRISMA diagram for Search 2 – implementation studies

The study aimed to examine the feasibility of adapting a PST intervention for low-income mothers with postnatal depression recruited from Healthy Start clinics in the US (Sampson et al., 2016), consisting of 8 to 16 sessions delivered at home by caseworkers.

The 93% retention rate, 100% completion of homework rate and high satisfaction among caseworkers indicated feasibility. Implementation challenges included high burden on caseworkers and fidelity not assessed due to caseworker concerns about video-recording.

There is further evidence in the effectiveness studies reviewed. Where fidelity was monitored (9, 11, 12, 13, 14, 16, 17), high levels were reported. However, studies identified challenges including attrition (1, 4, 6, 10); challenges with operationalising online programmes (1, 6); and practitioner skills (10).

5. STUDY LIMITATIONS

This is the first review of PS focused on AYA, and includes PST and multi-component interventions. We excluded studies that included four treatments known to be effective in treating depression among AYA (e.g., CBT), where the unique contribution of PS to clinical outcome could not be disentangled.

We relied on authors' reporting to determine if PS was included: details about operationalisation of PS were often scant. Little evidence addressing the fit, feasibility, or acceptability of PS interventions was found, reflecting a limited focus on implementation. We included only English-language texts: relevant studies in other languages may exist, though our post-2000 inclusion criteria may limit this potential bias. Finally, the heterogeneity of study populations, problem severity, comparison conditions, outcome measures, and study designs along with a relatively small number of included studies limits confidence in what we can say about implementation and treatment outcomes.

6. DISCUSSION

This review has examined the evidence on the effectiveness of PS in the treatment or prevention of depression among 13-25 year olds. We found 18 studies involving 16 interventions. We sought to determine in what way, in which contexts, and for whom PS appears to work in addressing depression. Results were mixed in terms of reducing depression and suicidality. When compared with no treatment, PS were sometimes effective even in highly controlled studies with AYA. Yet, when compared with active control among AYA with at least mild depression, PS was often no more effective than other approaches. As a preventive effort, PS appears fairly limited when depression is not present. Beyond these broad conclusions, it is difficult to discern differences between effective and non-effective studies. Studies varied in terms of location (LMIC and high income contexts); modality and dosage (from a single session video-based intervention to greater frequency sessions; individual and group delivery; online and in-person); and interventions delivered at school, university, and youth mental health services setting. A broad conclusion might be that PS can be delivered effectively in a range of different contexts and forms, is acceptable to a range of populations, and can be tailored to address different types of problems.

However, it is also clear that many efforts did not succeed, although the scale of impact is broadly in line with the small to moderate effectiveness of other treatments for youth depression (Weisz et al 2019). There are possible explanations for this. As noted, the scope for effectiveness for mild (or no) depressive symptoms may be very limited. It may be unrealistic to expect a stand-alone PS intervention (as eight of the studies were) to decrease depression symptoms especially if comorbid mental health difficulties exist, the problems experienced are not easily resolved, or an equally viable intervention is offered. There was little information about comorbidity in most of the studies and no analysis of whether it influenced outcomes.

Our review also highlights shortcomings in study design, methods, and reporting. Studies varied in how well PS was operationalised. Low dosage is consistent with usage described in informal conversations with practitioners, but may be insufficient for effectiveness. Only six treatments covered all or most PST steps. Fidelity was monitored in only half the studies despite evidence that monitoring implementation improves effectiveness (Durlak & Dupre, 2009). There were references to implementation difficulties including attrition, challenges in operationalizing online interventions, and skills of those delivering. More information about implementation is essential to understand the potential of PS for wider dissemination.

The small sample size of many studies may mean there were effects that were not found, and there may have been longer-term effects in the preventative studies not captured by short follow-up periods.

Our review found limited evidence about PS skills as mediator or moderator of depression. Few studies measured improvements in PS skills, fewer still found interventions effective here. The absence of evidence for PS abilities as a pathway is puzzling. It may be that specific aspects of PS behaviours and processes (such as problem orientation (Becker-Weidman et al., 2010) are relevant. Our interviews with AYA and with practitioners point to bi-directional and possibly complex relationships between PS and depression, which may weaken the association between PS and depression outcomes. Alternatively, there may be a mechanism other than PS skills through which PS interventions have an effect on depression.

Overall our review points to a need for continued innovation in treatment to improve the operationalising and testing of PS. It also highlights the need for study methods that allow us to

understand the specific effects of PS, and that measure the frequency, dosage and timing of PS to understand what is effective for whom and in what contexts.

REFERENCES

Reviewed studies

- Bird, T., Mansell, W., Wright, J., Gaffney, H., & Tai, S. (2018). Manage your life online: A web-based randomized controlled trial evaluating the effectiveness of a problem-solving intervention in a student sample. *Behavioural and Cognitive Psychotherapy*, 46(5), 570-582.
- Brugha, T. S., Wheatley, S., Taub, N. A., Culverwell, A., Friedman, T., Kirwan, P., Jones, D. R., & Shapiro, D. A. (2000). Pragmatic randomized trial of antenatal intervention to prevent postnatal depression by reducing psychosocial risk factors. *Psychological Medicine*, 30, 1273-1281.
- Chibanda, D., Shetty, A. K., Tshimanga, M., Woelk, G., Stranix-Chibanda, L., & Rusakaniko, S. (2014). Group problem-solving therapy for postnatal depression among HIV-positive and HIV-negative mothers in Zimbabwe. *Journal of the International Association of Providers of AIDS Care*, 13(4), 335-341.
- Dietz, L. J., Marshal, M. P., Burton, C. M., Brudge, J. A., Birmaher, B., Kolko, D., Duffy, J. N., & Brent, D. A. (2014). Social problem solving among depressed adolescents is enhanced by structured psychotherapies. *Journal of Consulting and Clinical Psychology*, 82(2), 202-211.
- Eskin, M., Ertekin, K., & Demir, H. (2008). Efficacy of a problem-solving therapy for depression and suicide potential in adolescents and young adults. *Cognitive Therapy and Research*, 32, 227-245.
- Fitzpatrick, K. K., Witte, T. K., & Schmidt, N. B. (2005). Randomized controlled trial of a brief problem-orientation intervention for suicidal ideation. *Behavior Therapy*, 36(4), 323-333.
- Gaffney, H., Mansell, W., Edwards, R., & Wright, J. (2014). Manage Your Life Online (MYLO): A pilot trial of a conversational computer-based intervention for problem solving in a student sample. *Behavioural and cognitive psychotherapy*, 42(6), 731.
- Gureje, O., Oladeji, B. D., Montgomery, A. A., Araya, R., Bello, T., Chisholm, D., ... & Tan, W. (2019). High-versus low-intensity interventions for perinatal depression delivered by non-specialist primary maternal care providers in Nigeria: Cluster randomised controlled trial (the EXPONATE trial). *British Journal of Psychiatry*, 215(3).
- Haefffel, G. J., Hein, S., Square, A., Macomber, D., Lee, M., Chapman, J., & Grigorenko, E. L. (2017). Evaluating a social problem solving intervention for juvenile detainees: Depressive outcomes and moderators of effectiveness. *Development and psychopathology*, 29(3), 1035-1042.
- Hallford, D. J., & Mellor, D. (2016). Autobiographical Memory-Based Intervention for Depressive Symptoms in Young Adults. *Psychotherapy and psychosomatics*, 85(4), 246-249.

Hoek, W., Schuurmans, J., Koot, H. M., & Cuijpers, P. (2012). Effects of Internet-based guided self-help problem-solving therapy for adolescents with depression and anxiety: A randomized controlled trial. *PLoS One*, 7(8), e43485.

Hood, K. K., Iturralde, E., Rausch, J., & Weissberg-Benchell, J. (2018). Preventing diabetes distress in adolescents with type 1 diabetes: Results 1 year after participation in the STePS program. *Diabetes Care*, 41(8), 1623-1630.

Kolko, D. J., Brent, D. A., Baugher, M., Bridge, J., & Birmaher, B. (2000). Cognitive and family therapies for adolescent depression: Treatment specificity, mediation, and moderation. *Journal of Consulting and Clinical Psychology*, 68(4), 603-614.

Makover, H., Adrian, M., Wilks, C., Read, K., Vander Stoep, A., & McCauley, E. (2019). Indicated Prevention for Depression at the Transition to High School: Outcomes for Depression and Anxiety. *Prevention Science*, 20(4), 499-509.

Noh, D. (2018). The Effect of a Resilience Enhancement Programme for Female Runaway Youths: A Quasi-Experimental Study. *Issues in Mental Health Nursing*, 39(9), 764-772.

Parker, A. G., Hetrick, S. E., Jorm, A. F., Mackinnon, A. J., McGorry, P. D., Yung, A. R., ... & Purcell, R. (2016). The effectiveness of simple psychological and physical activity interventions for high prevalence mental health problems in young people: a factorial randomised controlled trial. *Journal of Affective Disorders*, 196, 200-209.

Tezel, A., & Gözümlü, S. (2006). Comparison of effects of nursing care to problem solving training on levels of depressive symptoms in post partum women. *Patient Education and Counseling*, 63(1-2), 64-73.

Xavier, A., Otero, P., Blanco, V., & Vázquez, F. L. (2019). Efficacy of a problem-solving intervention for the indicated prevention of suicidal risk in young Brazilians: Randomized controlled trial. *Suicide and Life-Threatening Behavior*, 49(6), 1746-1761.

Other references

Angold, A., & Costello, E. J. (2001). *The epidemiology of depression in children and adolescents*. In I. M. Goodyer (Ed.), *Cambridge child and adolescent psychiatry. The depressed child and adolescent* (p. 143–178). Cambridge University Press.

Avenevoli, S., Knight, E., Kessler, R. C., & Merikangas, K. R. (2008). *Epidemiology of depression in children and adolescents*. In J. R. Z. Abela & B. L. Hankin (Eds.), *Handbook of depression in children and adolescents* (p. 6–32). The Guilford Press.

Becker-Weidman, E.G., Jacobs, R.H., Reinecke, M.A., Silva, S.G. & March, J.S. (2010). Social problem-solving among adolescents treated for depression. *Behaviour Research and Therapy* 48, 11-18

Bell, A. C., & D’Zurilla, T. J. (2009). Problem-solving therapy for depression: A meta-analysis *Clinical Psychology Review*, 29, 348-353.

- Biggam, F. H., & Power, K. G. (2002). A controlled, problem-solving, group-based intervention with vulnerable incarcerated young offenders. *International Journal of Offender Therapy and Comparative Criminology*, 46, 678-698.
- Boustani, M.M., Frazier, S.L., Becker, K.D., Bechor, M., Dinizulu, S.M., Hedemann, E.R., Ogle, R.R., & Pasalich, D.S. (2015). Common Elements of Adolescent Prevention Programs: Minimizing Burden While Maximising Reach. *Administration Policy in Mental Health*, 42(2), 209-219.
- Bridge, J. A., Greenhouse, J.B., Weldon, A.H., Campo, J.V., & Kelleher, K.J. (2008). Suicide Trends Among Youths Aged 10 to 19 Years in the United States, 1996-2005. *JAMA*, 300(9), 1025–1026.
- Chang, E.C. (2002). Predicting suicide ideation in an adolescent population: examining the role of social problem solving as a moderator and a mediator. *Personality and Individual Differences*, 32 1279-1291
- Chibanda, D., Mesu, P., Kajawu, L., Cowan, F., Araya, R., & Abas, M. A. (2011). Problem-solving therapy for depression and common mental disorders in Zimbabwe: Piloting a task-shifting primary mental health care intervention in a population with a high prevalence of people living with HIV. *BMC public Health*, 11(1), 828-838.
- Chorpita, B.F., & Daleiden, E.L. (2009). Mapping evidence-based treatments for children and adolescents: Application of the distillation and matching model to 615 treatments from 322 randomized trials. *Journal of Consulting and Clinical Psychology*, 77(3), 566-579.
- D’Zurilla, T. J., & Nezu, A. M. (1999). *Problem-solving therapy: A social competence approach to clinical intervention* (2nd ed.). New York: Springer.
- D’Zurilla, T.J., & Nezu, A.M. (2007). *Problem-solving therapy: A positive approach to clinical intervention* (3rd edition) New York: Spring Publishing Company.
- D’Zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology*, 78(1), 107.
- Dietz, L. J., Silk, J., & Amole, M. (2019). Depressive disorders. Eds T. H. Ollendick, S. W. White, & B. A. White. *The Oxford Handbook of Clinical Child and Adolescent Psychology* (pp. 280-297). Oxford University Press, New York, NY.
- Durlak, J.A. & DuPre, E.P. (2009) Implementation Matters: A Review of Research on the Influence of Implementation on Program Outcomes and the Factors Affecting Implementation. *American Journal of Community Psychology*, 41:327-350.
- Frye, A.A. & Goodman, S.H. (2000) Which Social Problem-Solving Components Buffer Depression in Adolescent Girls? *Cognitive Therapy and Research* 24(6) 637-650
- Higgins, J.P.T., Sterne, J.A.C., Savović, J., Page, M.J., Hróbjartsson, A., Boutron, I., ... Eldridge, S. (2016). A revised tool for assessing risk of bias in randomized trials. In: Chandler J.,

McKenzie J., Boutron I., Welch V. (Eds.), Cochrane Methods. Cochrane Database of Systematic Reviews, Issue 10 (Suppl 1).

Hogue, A., Bobek, M., Dauber, S., Henderson, C. E., McLeod, B. D., & Southam-Gerow, M. A. (2017). Distilling the core elements of family therapy for adolescent substance use: Conceptual and empirical solutions. *Journal of Child and Adolescent Substance Abuse*, 26(6), 437-453.

Johnsen T. J., & Friberg, O. (2016). The effects of cognitive behavioral therapy as an anti-depressive treatment is falling: A meta-analysis [published correction appears in Psychol Bull Mar;142(3):290]. *Psychological Bulletin*, 141(4),747-768.

Kovacs, M., Feinberg, T.L., Crouse-Novak, M.A., Paulauskas, S.L., & Finkelstein, R. (1984). Depressive Disorders in Childhood: A Longitudinal Prospective Study of Characteristics and Recovery. *Archives of General Psychiatry*, 41(3), 229–237.

Lewinsohn, P.M., & Clarke, G.N. (1999). Psychosocial treatments for adolescent depression. *Clinical Psychology Review*, 19(3), 329-342.

Lewinsohn, P. M., Rohde, P., Seeley, J. R., & Fisher, S. A. (1993). Age-cohort changes in the lifetime occurrence of depression and other mental disorders. *Journal of Abnormal Psychology*, 102, 110-120.

Malouf, J.M., Thorsteinsson, E.B., & Schutte, N.S. (2006). The efficacy of problem solving therapy in reducing mental and physical health problems: A meta-analysis. *Clinical Psychology Review*, 27, 46-57.

Merikangas, K.R., Jin, R., He, J.P., Kessler, R.C., Lee, S., Sampson, N.A., . . . & Zarkov, Z. (2011). Prevalence and correlates of bipolar spectrum disorder in the world mental health survey initiative. *Archives of General Psychiatry*, 68(3), 241-251.

Merikangas, K. R., He, J. P., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., Benjet, C., Georgiades, K., & Swendsen, J. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: results from the National Comorbidity Survey Replication--Adolescent Supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry*, 49(10), 980–989.

Merikangas, K. R., Nakamura, E. F., & Kessler, R. C. (2009). Epidemiology of mental disorders in children and adolescents. *Dialogues in Clinical Neuroscience*, 11, 7–20.

Murray, L.K., Dorsey, S., Haroz, E., Lee, C., Alsiahy, M.M., Haydary, A., Weiss, W.M. and Bolton, P. (2014). A Common Elements Treatment Approach for Adult Mental Health Problems in Low- and Middle-Income Countries. *Cognitive and Behavioral Practice*, 21(2), 111-123

Mynors-Wallis, L.M. (2005). *Problem-solving treatment for anxiety and depression: A practical guide*. Oxford University Press: Oxford.

Nezu, A.M. (1987). A problem solving formulation of depression: A literature review and proposal of a pluralistic model. *Clinical Psychology Review*, 7 121-144

Perera, E.A.R., & Kathriarchchi, S.T. (2011). Problem-solving counselling as a therapeutic tool on youth suicidal behavior in the suburban population in Sri Lanka. *Indian Journal of Psychiatry* 53(1).

Puig-Antich, J., Kaufman, J., Ryan, N.D., Williamson, D. E., Dahl, R.E., Lukens, E., Todak, G., Ambrosini, P., Rabinovich, H., & Nelson, B. (1993). The psychosocial functioning and family environment of depressed adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32, 244-253.

Reinecke, M.A., Ryan, N.E., & DuBois, D.L. (1998). Meta-analysis of CBT for depression in adolescents: Dr. Reinecke et al. reply. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37, 1006-1007.

Rohde, P., Lewinsohn, P. M., & Seeley, J. R. (1991). Comorbidity of unipolar depression: II. Comorbidity with other mental disorders in adolescents and adults. *Journal of Abnormal Psychology*, 54, 653-660.

Sampson, M., Villarreal, Y., & Rubin, A. (2016). A problem-solving therapy intervention for low-income, pregnant women at risk for postpartum depression. *Research on Social Work Practice*, 26(3), 236-242.

Skeen, S., Laurenzi, C.A., Gordon, S.L., du Toit, S., Tomlinson, M., Dua, T., . . . & Melendez-Torres, G.J. (2019). Adolescent Mental Health Program Components and Behavior Risk Reduction: A Meta-analysis. *Pediatrics* 144, 2, e20183488.

Smith, K. (2014). Mental health: A world of depression: A global view of the burden caused by depression. *Nature*, 515, 180–181.

Speckens, A.E.M. & Hawton, K. (2005). Social Problem Solving in Adolescents with Suicidal Behaviour: A Systematic Review. *Suicide and Life-Threatening Behaviour* 35(4) 365-387

Spence, S.H., Sheffield, J.K., & Donovan, C.L. (2003). Preventing adolescent depression: An evaluation of the problem solving for life program. *Journal of Consulting and Clinical Psychology*, 71(1), 3-13.

Sterne, J. A., Savović, J., Page, M. J., Elbers, R. G., Blencowe, N. S., Boutron, I., ... & Emberson, J. R. (2019). RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*, 366(14898).

Stice, E., Rohde, P., Gau, J., & Ochner, C. (2011). Relation of depression to perceived social support: Results from a randomized adolescent depression prevention trial. *Behaviour Research and Therapy*, 49(5), 361–366.

Weersing, V. R., & Weisz, J. R. (2002). Community clinic treatment of depressed youth: Benchmarking usual care against CBT clinical trials. *Journal of Consulting and Clinical Psychology*, 70, 299–310.

Weersing, V. R., Jeffreys, M., Do, M. T., Schwartz, K. T., & Bolano, C. (2017). Evidence Base Update of Psychosocial Treatments for Child and Adolescent Depression. *Journal of Clinical Child and Adolescent Psychology*, 46(1), 11–43.

Weisz, J., Bearman, S.K., Santucci, L.C., & Jensen-Doss, A. (2017). Initial test of a principle-guided approach to transdiagnostic psychotherapy with children and adolescents. *Journal of Clinical Child & Adolescent Psychology*, 46(1), 44-58.

Weisz, J., Gordis, E., Chu, B., McLeod, B., Updegraff, A., Southam-Gerow, M.A., ... & Weiss, B. (2009). Cognitive-behavioral therapy versus usual clinical care for youth depression: An initial test of transportability to community clinics and clinicians. *Journal of Consulting and Clinical Psychology*, 77, 383–396.

Weisz, J.R., Kuppens, S., Eckshtain, D., Ugueto, A.M., Hawley, K.M., & Jensen-Doss, A. (2013). Performance of evidence-based youth psychotherapies compared with usual clinical care: a multilevel meta-analysis. *JAMA Psychiatry*, 70(7), 750-761.

Weisz, J.R., Kuppens, S., Ng, M., Eckshtain, D., Vaughn-Coaxum, R.A., ... & Fordwood, S. R. (2017). What five decades of research tells us about the effects of youth psychological therapy: A multilevel meta-analysis and implications for science and practice. *American Psychologist*, 72(2), 79-117.

Weisz, J.R., Kuppens, S., Ng, M., Vaughn-Coaxum, R.A., Ugueto, A.M., Eckshtain, D., & Corteselli, K.A. (2019). Are psychotherapies for young people growing stronger? Tracking trends over time for youth anxiety, depression, attention-deficit/hyperactivity disorder, and conduct problems. *Perspectives on Psychological Science*, 14(2), 216-237.

Zisook, S., Lesser, I., Stewart, J. W., Wisniewski, S. R., Balasubramani, G. K., Fava, M., ... & Trivedi, M. H. (2007). Effect of age at onset on the course of major depressive disorder. *American Journal of Psychiatry*, 164(10), 1539-1546.