

Supplemental Information

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Appendix A: Expanded listing of intervention types and associated delivery platforms

School based interventions:

Mental health and positive development interventions delivered through a school platform provide a promising vehicle for extending the reach of children’s mental health care and for decreasing disparities in quality and accessibility of mental health services. Universal prevention programs focus on promoting positive development in school-age children, and seek to achieve social, emotional, cognitive, behavioral skills and foster self-efficacy and resilience. Targeted strategies focus on addressing risk factors exhibited by a child for future mental health issues.

The following are some examples of school-based interventions:

Universal prevention strategies: Teaching skills like problem solving, coping skills development, self-management, resilience skills, social & emotional development and mental health promotion, nurture groups

Bullying prevention: Student-teacher and child-parent interaction, role playing, discussions and games to teach self-efficacy and empathy, education of positive peer relationships, emotion management, empathy, links with families and communities (for aggressive behaviors)

Self-harm prevention: Suicide prevention programs, gatekeeper training, peer leadership training, psychological treatment for suicide and self-harm prevention, screening tools

Substance use: Peer-to-peer education, smoking cessation programs, universal drug and alcohol use prevention programs, smoking cessation programs

Responsive Caregiving and Security, Stability, and Safety: Teacher training and partnerships with parents (on healthy child development, social and emotional skills), Child sexual abuse prevention programs (knowledge of sexual abuse and sexual abuse prevention concepts, or skill acquisition in protective behaviors, or both)

Early learning and positive development: Student learning: anger management, internalizing and externalizing feelings, social emotional learning, self-management and interpersonal skills learning

Community-based interventions:

Community-based interventions have the advantage of utilizing existing community framework and setup for delivery of interventions. Using recreational and information centers such as community clubs and libraries as a platform for information dissemination.

For example, using religious leaders and educators as gatekeepers for raising awareness of adolescent-related issues by sensitizing the gatekeepers to such issues. Also increasing children involvement and engagement in community affairs by bringing them onboard for various decision-making processes results in their empowerment and skill building.

The following are some examples of community-based interventions:

Universal prevention strategies: Community art and crafts education for emotional control and self-resilience, community extracurricular activities (music, dance, art)

Self-harm prevention and treatment: Parent training or child social skills training

Responsive Caregiving and Security, Stability, and Safety: Parent education programs (positive parenting, psychostimulation), Home visits, Parent education programs (through home visitation, group based) - individual counseling, group discussion, CBT strategies, guided mother-child play.

Digital/Technology-based interventions:

Mental health and positive development interventions by providing access to ICT (e.g. through use of the Internet and mobile phones) can be very beneficial and cost-effective as it can be easily accessed by a significant number of children and doesn't require a complicated framework setup. Additionally, this approach can provide a platform to broadcast information for existing/new community-based services and for increasing awareness.

The following are some examples of digital/technology-based interventions:

Universal prevention strategies: Peer-to-peer support groups, online forums and message boards, virtual reality chat, mass media intervention

Bullying prevention: Online games and modules for universal bullying prevention (ex. role-playing, empathy training), various forms of therapy (e.g. CBT, solution-focused brief therapy)

Self-harm prevention and treatment: Mass media intervention, computerized CBT

Individual/Family-based interventions:

Mental health and positive development interventions provided by various stakeholders like health practitioners, social workers, school teachers etc. to be used at the home/family level. Such interventions enable the parents and children to acquire a better perspective of their problems and means to address them in a private setting. These are modifiable according to personal requirements and have a more targeted approach as they can be moulded according to needs.

The following are some examples of individual/family-based interventions:

Responsive Caregiving and Security, Stability, and Safety: Parent education programs (positive parenting, psychostimulation), Home visits, Parent education programs (through home visitation, group based) - individual counseling, group discussion, CBT strategies, guided mother-child play.

Early learning and positive development: Parent education programs on positive child-parent interactions

Appendix B: Search strategies for each domain (OVID MEDLINE)

	Universal Prevention
1	exp child/ or children*.mp. or child*.mp. or schoolchild*.mp. or school child*.mp. or adolescen*.mp. or teen*.mp. or pubescen*.mp. or school.mp. or school-age.mp.
2	exp mental health/ or mental health.tw,kf. or positive develop*.tw,kf. or positive youth develop*.tw,kf.
3	(universal intervention or primary intervention or interven* or prevent* or learn* or educat*).mp. or exp "early intervention (education)"/
4	1 and 2 and 3
5	limit 4 to (humans and "all child (0 to 18 years)" and (meta analysis or "systematic review"))

	Bullying
1	exp child/ or children*.mp. or child*.mp. or schoolchild*.mp. or school child*.mp. or adolescen*.mp. or teen*.mp. or pubescen*.mp. or school.mp. or school-age.mp.
2	exp Bullying/ or (Bullying or Cyberbullying).tw,kf. or cyber aggression.tw,kf. or electronic bullying.tw,kf. or online bullying.tw,kf.
3	exp Bullying/pc or exp Cyberbullying/pc or exp mental health/pc or exp mental disorders/pc, th or "anti-bullying interventions".mp. or "intervention program".mp. or interven*.mp. or prevent*.tw, kf or exp "Early Intervention (Education)"/ or "Early Intervention (Education)".tw,kf.
4	1 and 2 and 3
5	limit 4 to (humans and "all child (0 to 18 years)" and (meta analysis or "systematic review"))

	Substance Abuse
1	exp child/ or children*.mp. or child*.mp. or schoolchild*.mp. or school child*.mp. or adolescen*.mp. or teen*.mp. or pubescen*.mp. or school.mp. or school-age.mp.
2	exp Substance-Related Disorders/ or exp Alcohol Drinking/ or "Substance-Related Disorders".tw, kf. or exp Smoking/ or Smoking.tw, kf. or exp "Tobacco Use"/ or "Tobacco Use".tw, kf or ("substance abuse" or "substance use" or "drugs use" or "substance dependence" or "drug dependence").tw,kf.
3	exp Substance-Related Disorders/pc, rh, th or exp "Early Intervention (Education)"/ or intervention program.mp. or interven*.mp. or prevent*.tw,kf.
4	exp mental health/pc or exp Mental Disorders/pc, th
5	1 and 2 and 3 and 4
6	limit 5 to (humans and "all child (0 to 18 years)" and (meta analysis or "systematic review"))

	Responsive Caregiving
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1	exp child/ or children*.mp. or child*.mp. or schoolchild*.mp. or school child*.mp. or adolescen*.mp. or teen*.mp. or pubescen*.mp. or school.mp. or school-age.mp.
2	responsive caregiving.mp. or parenting interventions.tw,kf. or exp Child Rearing/td or parenting practices.tw,kf.
3	exp Child Rearing/ed or exp Caregivers/ed or exp Parents/ed or Parents education.mp. or caregivers education.mp. or Family Therapy.mp. or exp Family Therapy/ or exp "Early Intervention (Education)"/ or "Early Intervention (Education)".tw,kf. or (prevent* or interven*).tw,kf.
4	1 and 2 and 3
5	limit 4 to (humans and "all child (0 to 18 years)" and (meta analysis or "systematic review"))

Early Learning and Positive Development	
1	exp child/ or children*.mp. or child*.mp. or schoolchild*.mp. or school child*.mp. or adolescen*.mp. or teen*.mp. or pubescen*.mp. or school.mp. or school-age.mp.
2	"positive youth development".tw,kf. or exp Child Development/ or "child development".tw,kf. or exp Adolescent Development/ or "Adolescent Development".tw,kf. or "early child development".tw,kf. or "healthy development".tw,kf.
3	exp "Early Intervention (Education)"/ or early childhood education.mp. or intervent*.tw, kf or "early learning".tw, kf or vocational training.mp. or exp Vocational Education/ or
4	1 and 2 and 3
5	limit 4 to (humans and "all child (0 to 18 years)" and (meta analysis or "systematic review"))

Self-harm	
1	exp child/ or children*.mp. or child*.mp. or schoolchild*.mp. or school child*.mp. or adolescen*.mp. or teen*.mp. or pubescen*.mp. or school.mp. or school-age.mp.
2	exp self-injurious behavior/ or "self-injurious behavior".tw, kf. or exp suicide/ or suicide.tw, kf. or exp Factitious Disorders/ or "Factitious Disorders".tw, kf. or "self harm".tw, kf. or "self mutilation".tw, kf. or self inflict*.tw, kf
3	exp mental health/pc or exp mental disorders/pc, th or intervention.mp. or exp "Early Intervention (Education)"/ or "Early Intervention (Education)".tw,kf. or exp self-injurious behavior/pc or ((suicide adj prevent*) or interven*).tw,kf.
4	1 and 2 and 3
5	limit 4 to (humans and "all child (0 to 18 years)" and (meta analysis or "systematic review"))

Appendix C: Eligibility criteria

SCREENING QUESTIONS	NO	YES	UNCLEAR
Titles of systematic reviews			
- Make quick judgements to exclude reviews based on the following screening questions			
- If it is unclear or cannot be excluded, then it must be processed for abstract screening			
1. Was the review published before 2000?			
IF YES, THEN EXCLUDE			
2. Is it published in English?			
IF NO, THEN EXCLUDE			
3. Does it address mental health or positive development?			
IF NO, THEN EXCLUDE			
Abstracts of systematic reviews			
1. Is the paper a systematic review of an intervention, programme or policy?			
IF NO, THEN EXCLUDE			
2. Is the review focused on evaluating efficacy/effectiveness of an intervention or program, or looking at an association between an intervention and mental health?			
IF NO, THEN EXCLUDE			
3. Does it cover the age groups of interest? (5 to 19 years)			
IF NO, THEN EXCLUDE			
Full text of systematic reviews			
1. Does it cover either one/both of these age groups: 5 - 9.9 or 10 - 14.9 years? <i>Note: Include if the target age range of the intervention is 10 to 19 years, but exclude reviews where the target age range of the intervention is 15 to 19 years. We would reviews if the average age of 10 years would but studies with a sample of an average age of 15 years would be excluded</i>			
IF NO, THEN EXCLUDE			
2. Does the review report significant changes related to mental well-being and/or positive development outcomes and indicators? <i>Note: Reviews that do not report significant changes will still need to be identified and categorized into a separate folder that will not proceed to the extraction stage, but will remain considered in the overview to know which interventions exist but are not effective</i>			
IF NO, THEN EXCLUDE			

SCREENING QUESTIONS	NO	YES	UNCLEAR
<p>3. Does the review evaluate a programme, intervention or series of interventions directed at improving outcomes in one of the following domains:</p> <ul style="list-style-type: none"> Self-harm prevention Bullying prevention (including cyberbullying) Substance use prevention Universal prevention strategies Nurturing care and healthy/positive development (Safety, Security and Maltreatment, Responsive Caregiving, Early Learning Opportunities) 			

IF NO, THEN EXCLUDE

4. Is the review described as a systematic review or meta-analysis?
 If **YES**, the review needs to meet the following criteria:
 A) concern the effectiveness or impact of interventions, programmes or policies?
 B) Synthesize experimental or quasi-experimental studies?
 C) Clearly describe methods used for searches, screening, data collection, and synthesis?

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IF NO, THEN EXCLUDE

Appendix D: Standardized data extraction form fields.

REVIEW CHARACTERISTICS		Search Date Range
		WHO Regions
		Year(s) of Data Collection
		Included study characteristics
		Research Question
		Primary outcomes
		Author's Conclusions
		Cochrane Review
		Published
		Includes only RCTs
		Participant characteristics at enrolment
Age		
Health Status		
META-ANALYSIS DETAILS	Intervention and Comparison	Level of Implementation (E.g. home, school, community, etc.)
		Type of Intervention
		Intervention Form (E.g. Sessions, treatment plan, Therapy)
		Comparison (B)
	Participant Count	Total
		Intervention Group
		Control group
POOLED OUTCOMES & EFFECT SIZES		Outcome Category
		Outcome
		Measurement Tool(s) for Development Outcomes
		# studies
		N
		Effect Size
		95% CI
		Unit
		p value
		Heterogeneity [I^2]

AMSTAR2: REVIEW QUALITY ASSESSMENT CHECKLIST	Final rating
	PICO
	review methods priori
	explain their selection of the study designs
	comprehensive literature search strategy
	study selection in duplicate
	data extraction in duplicate
	list of excluded studies and justify the exclusions
	included studies in adequate detail
	risk of bias (RoB)
	sources of funding
	appropriate methods for statistical combination of results
	assess the potential impact of RoB in individual studies
	account for RoB in individual studies
	heterogeneity observed
	publication bias
	sources of conflict of interest

Appendix E: Table of Excluded Studies

Number	Reference	Reason for Exclusion
1	Akhtar S, Barlow J. Forgiveness Therapy for the Promotion of Mental Well-Being: A Systematic Review and Meta-Analysis. <i>Trauma Violence Abuse</i> . 2018;19(1):107-122.	Treatment focused-wrong intervention type.
2	Barlow J, Smailagic N, Bennett C, Huband N, Jones H, Coren E. Individual and group based parenting programmes for improving psychosocial outcomes for teenage parents and their children. <i>Cochrane Database of Systematic Reviews</i> . 2011;(3):CD002964.	Participant age group not of interest.
3	Barlow J, Bergman H, Kornør H, Wei Y, Bennett C. Group-based parent training programmes for improving emotional and behavioural adjustment in young children. <i>Cochrane Database of Systematic Reviews</i> . 2016;(8):CD003680.	Participant age group not of interest.
4	Baumel A, Pawar A, Mathur N, Kane JM, Correll CU. Technology-Assisted Parent Training Programs for Children and Adolescents With Disruptive Behaviors: A Systematic Review. <i>J Clin Psychiatry</i> . 2017;78(8):e957-e969.	Treatment focused-wrong intervention type.
5	Bennett S, Shafran R, Coughtrey A, Walker S, Heyman I. Psychological interventions for mental health disorders in children with chronic physical illness: a systematic review. <i>Arch Dis Child</i> . 2015;100(4):308-16.	Treatment focused-wrong intervention type.
6	Birdee GS, Yeh GY, Wayne PM, Phillips RS, Davis RB, Gardiner P. Clinical applications of yoga for the pediatric population: a systematic review. <i>Acad Pediatr</i> . 2009;9(4):212-220.	Treatment focused-wrong intervention type.
7	Boshoff K, Bowen H, Paton H, et al. Child Development Outcomes of DIR/Floortime TM-based Programs: A Systematic Review. <i>Canadian Journal of Occupational Therapy</i> . 2020;87(2):153-164.	Treatment focused-wrong intervention type.
8	Brown FL, de Graaff AM, Annan J, Betancourt TS. Annual Research Review: Breaking cycles of violence - a systematic review and common practice elements analysis of psychosocial interventions for children and youth affected by armed conflict. <i>J Child Psychol Psychiatry</i> . 2017;58(4):507-524.	Treatment focused-wrong intervention type.
9	Carney T, Myers BJ, Louw J, Okwundu CI. Brief school-based interventions and behavioural outcomes for substance-using adolescents. <i>Cochrane Database Syst Rev</i> . 2016;2016(1):CD008969.	Treatment focused-wrong intervention type.
10	Carr A, Hartnett D, Brosnan E, Sharry J. Parents Plus Systemic, Solution-Focused Parent Training Programs: Description, Review of the Evidence Base, and Meta-Analysis. <i>Fam Process</i> . 2017;56(3):652-668.	Treatment focused-wrong intervention type.

Number	Reference	Reason for Exclusion
11	Charles JM, Bywater T, Edwards RT. Parenting interventions: a systematic review of the economic evidence. <i>Child: care, health and development</i> . 2011;37(4):462-474.	No outcomes of interest reported.
12	Cristea IA, Mogoșe C, David D, Cuijpers P. Practitioner Review: Cognitive bias modification for mental health problems in children and adolescents: a meta-analysis. <i>J Child Psychol Psychiatry</i> . 2015;56(7):723-734.	Treatment focused-wrong intervention type.
13	Daley D, van der Oord S, Ferrin M, et al. European ADHD Guidelines Group. Behavioral interventions in attention-deficit/hyperactivity disorder: a meta-analysis of randomized controlled trials across multiple outcome domains. <i>J Am Acad Child Adolesc Psychiatry</i> . 2014;53(8):835-47.	Treatment focused-wrong intervention type.
14	Dickson K, Melendez-Torres GJ, Fletcher A, et al. How Do Contextual Factors Influence Implementation and Receipt of Positive Youth Development Programs Addressing Substance Use and Violence? A Qualitative Meta-Synthesis of Process Evaluations. <i>American Journal of Health Promotion</i> . 2018;32(4):1110-1121.	No outcomes of interest reported.
15	Domhardt M, Steubl L, Baumeister H. Internet- and Mobile-Based Interventions for Mental and Somatic Conditions in Children and Adolescents: A Systematic Review of Meta-analyses. <i>Zeitschrift für Kinder-und Jugendpsychiatrie und Psychotherapie</i> . 2020;48(1):33-46.	Treatment focused-wrong intervention type.
16	Ekeland E, Heian F, Hagen KB. Can exercise improve self esteem in children and young people? A systematic review of randomised controlled trials. <i>Br J Sports Med</i> . 2005;39(11):792-798.	Treatment focused-wrong intervention type.
17	Filges T, Andersen D, Jørgensen A-MK. Functional Family Therapy (FTT) for Young People in Treatment for Non-opioid Drug Use: A Systematic Review. <i>Campbell Systematic Reviews</i> . 2015;11(1):1-77.	Treatment focused-wrong intervention type.
18	Filges T, Andersen D, Jørgensen A-MK. Effects of Multidimensional Family Therapy (MDFT) on Nonopioid Drug Abuse: A Systematic Review and Meta-Analysis. <i>Research on Social Work Practice</i> . 2018;28(1):68-83.	Treatment focused-wrong intervention type.
19	Filges T, Jorgensen A-MK. Cognitive–Behavioral Therapies for Young People in Outpatient Treatment for Nonopioid Drug Use. <i>Research on Social Work Practice</i> . 2018;28(3):363-385.	Treatment focused-wrong intervention type.
20	Flores EC, Fuhr DC, Bayer AM, et al. Mental health impact of social capital interventions: a systematic review. <i>Soc Psychiatry Psychiatr Epidemiol</i> . 2018; 53:107–119.	Participant age group not of interest.

Number	Reference	Reason for Exclusion
21	Foody M, Samara M, O'Higgins Norman J. Bullying and cyberbullying studies in the school-aged population on the island of Ireland: A meta-analysis. <i>Br J Educ Psychol.</i> 2017;87(4):535-557.	No outcomes of interest reported.
22	Furlong M, McGilloway S, Bywater T, Hutchings J, Smith SM, Donnelly M. Behavioural and cognitive-behavioural group-based parenting programmes for early-onset conduct problems in children aged 3 to 12 years. <i>Cochrane Database Syst Rev.</i> 2012;(2):CD008225.	Treatment focused-wrong intervention type.
23	Gardner F, Montgomery P, Knerr W. Transporting Evidence-Based Parenting Programs for Child Problem Behavior (Age 3–10) Between Countries: Systematic Review and Meta-Analysis. <i>Journal of Clinical Child & Adolescent Psychology.</i> 2016;45(6): 749-762.	Treatment focused-wrong intervention type.
24	Hahn RA, Rammohan V, Truman B, et al. Effects of full-day kindergarten on the long-term health prospects of children in low-income and racial/ethnic-minority populations: a community guide systematic review. <i>American Journal of Preventive Medicine.</i> 2014; 46(3): 312-23.	Participant age group not of interest.
25	Hillman K, Dix K, Ahmed K, et al. Interventions for anxiety in mainstream school-aged children with autism spectrum disorder: A systematic review. <i>Campbell Systematic Reviews.</i> 2020;16(2):e1086.	Treatment focused-wrong intervention type.
26	Hunter RF, de la Haye K, Murray JM, et al. Social network interventions for health behaviours and outcomes: a systematic review and meta-analysis. <i>PLoS medicine.</i> 2019;16(9):e1002890.	Participant age group not of interest.
27	Hurt L, Paranjothy S, Lucas PJ, et al. Interventions that enhance health services for parents and infants to improve child development and social and emotional well-being in high-income countries: a systematic review. <i>BMJ Open.</i> 2018; 8: e014899.	Participant age group not of interest.
28	Hutson E. Cyberbullying in Adolescence: A Concept Analysis. <i>ANS Adv Nurs Sci.</i> 2016;39(1):60-70.	No interventions reported.
29	Hutson E, Kelly S, Militello LK. Systematic Review of Cyberbullying Interventions for Youth and Parents With Implications for Evidence-Based Practice. <i>Worldviews Evid Based Nurs.</i> 2018;15(1):72-79.	Treatment focused-wrong intervention type.
30	Lakhani A, Macfarlane K. Playgroups offering health and well-being support for families: a systematic review. <i>Fam Community Health.</i> 2015;38(2):180-94.	Treatment focused-wrong intervention type.

Number	Reference	Reason for Exclusion
31	Lindstrøm M, Saidj M, Kowalski K, Filges T, Rasmussen PS, Jørgensen A-MK. Brief Strategic Family Therapy (BSFT) for Young People in Treatment for Non-Opioid Drug Use: A Systematic Review. <i>Campbell Systematic Reviews</i> . 2013;9(1):1-95.	Treatment focused-wrong intervention type.
32	Lindstrøm M, Saidj M, Kowalski K, Filges T, Rasmussen PS, Jørgensen A-MK. Family Behavior Therapy (FBT) for Young People in Treatment for Non-opioid Drug Use: A Systematic Review. <i>Campbell Systematic Reviews</i> . 2015; 11(1):1-77.	Treatment focused-wrong intervention type.
33	Littell JH, Popa M, Forsythe B. Multisystemic Therapy for social, emotional, and behavioral problems in youth aged 10-17. <i>Cochrane Database Syst Rev</i> . 2005;(4):CD004797.	Treatment focused-wrong intervention type.
34	Liverpool S, Mota CP, Sales CM, et al. Engaging children and young people in digital mental health interventions: systematic review of modes of delivery, facilitators, and barriers. <i>Journal of medical Internet research</i> . 2020;22(6):e16317.	No outcomes of interest reported.
35	Macdonald GM, Turner W. Treatment foster care for improving outcomes in children and young people. <i>Cochrane Database Syst Rev</i> . 2008;(1):CD005649.	Treatment focused-wrong intervention type.
36	Macdonald GM, Turner W. Treatment foster care for improving outcomes in children and young people. <i>Cochrane Database Syst Rev</i> . 2008;(1):CD005649.	Treatment focused-wrong intervention type.
37	Martin S, Sutcliffe P, Griffiths F, et al. Effectiveness and impact of networked communication interventions in young people with mental health conditions: a systematic review. <i>Patient Educ Couns</i> . 2011;85(2):e108-19.	Treatment focused-wrong intervention type.
38	Mcdaid D, Park AL. Investing in mental health and well-being: findings from the DataPrev project. <i>Health Promot Int</i> . 2011;26 Suppl 1(Suppl 1):i108-i139.	No outcomes of interest reported.
39	Moynihan M, Pitcher C, Saewyc E. Interventions that Foster Healing Among Sexually Exploited Children and Adolescents: A Systematic Review. <i>J Child Sex Abus</i> . 2018;27(4):403-423.	Treatment focused-wrong intervention type.
40	Mutamba BB, van Ginneken N, Smith Paintain L, Wandiembe S, Schellenberg D. Roles and effectiveness of lay community health workers in the prevention of mental, neurological and substance use disorders in low and middle income countries: a systematic review. <i>BMC Health Serv Res</i> . 2013;13:412.	Participant age group not of interest.
41	Pedersen GA, Smallegange E, Coetzee A, et al. A Systematic Review of the Evidence for Family and Parenting Interventions in Low- and Middle-Income Countries: Child and Youth Mental	Treatment focused-wrong intervention type.

Number	Reference	Reason for Exclusion
	Health Outcomes. <i>Journal of Child and Family Studies</i> . 2019;28:2036-2055.	
42	Pelsser LM, Frankena K, Toorman J, Rodrigues Pereira R. Diet and ADHD, Reviewing the Evidence: A Systematic Review of Meta-Analyses of Double-Blind Placebo-Controlled Trials Evaluating the Efficacy of Diet Interventions on the Behavior of Children with ADHD. <i>PLoS One</i> . 2017;12(1):e0169277.	Treatment focused-wrong intervention type.
43	Piquero AR, Farrington DP, Welsh BC, et al. Effects of early family/parent training programs on antisocial behavior & delinquency. <i>Campbell Systematic Reviews</i> . 2008;4(1):1-22.	Participant age group not of interest.
44	Punukollu M, Marques M. Use of mobile apps and technologies in child and adolescent mental health: a systematic review. <i>Evidence-Based Mental Health</i> . 2019; 22:161-166.	Treatment focused-wrong intervention type.
45	Reichow B, Steiner AM, Volkmar F. Social skills groups for people aged 6 to 21 with autism spectrum disorders (ASD). <i>Cochrane Database Syst Rev</i> . 2012;(7):CD008511.	Treatment focused-wrong intervention type.
46	Richardson T, Stallard P, Velleman S. Computerised cognitive behavioural therapy for the prevention and treatment of depression and anxiety in children and adolescents: a systematic review. <i>Clin Child Fam Psychol Rev</i> . 2010;13(3):275-90.	Treatment focused-wrong intervention type.
47	Riedinger V, Piquart M, Teubert D. Effects of Systemic Therapy on Mental Health of Children and Adolescents: A Meta-Analysis. <i>J Clin Child Adolesc Psychol</i> . 2017;46(6):880-894.	Treatment focused-wrong intervention type.
48	Roberts MY, Curtis PR, Sone BJ, Hampton LH. Association of Parent Training With Child Language Development: A Systematic Review and Meta-analysis. <i>JAMA Pediatr</i> . 2019;173(7):671–680.	Participant age group not of interest.
49	Ruiz-Zaldibar Ruiz-Zaldibar C, Serrano-Monzó I, Mujika A. Parental competence programs to promote positive parenting and healthy lifestyles in children: a systematic review. <i>J Pediatr (Rio J)</i> . 2018;94(3):238-250.	Participant age group not of interest.
50	Shah R, Kennedy S, Clark MD, Bauer SC, Schwartz A. Primary Care-Based Interventions to Promote Positive Parenting Behaviors: A Meta-analysis. <i>Pediatrics</i> . 2016;137(5): e20153393.	Participant age group not of interest.
51	Smedslund G, Berg RC, Hammerstrøm KT, et al. Motivational interviewing for substance abuse. <i>Campbell Systematic Reviews</i> . 2011;7(1):1-26.	Participant age group not of interest.

Number	Reference	Reason for Exclusion
52	Steele DW, Becker SJ, Danko KJ, et al. Brief Behavioral Interventions for Substance Use in Adolescents: A Meta-analysis. <i>Pediatrics</i> . 2020;146(4): e20200351.	Treatment focused-wrong intervention type.
53	Suter JC, Bruns EJ. Effectiveness of the wraparound process for children with emotional and behavioral disorders: a meta-analysis. <i>Clin Child Fam Psychol Rev</i> . 2009;12(4):336-51.	Treatment focused-wrong intervention type.
54	Szlyk H, Tan J. The Role of Technology and the Continuum of Care for Youth Suicidality: Systematic Review. <i>J Med Internet Res</i> . 2020;22(10):e18672.	Participant age group not of interest.
55	Takacs ZK, Kassai R. The efficacy of different interventions to foster children's executive function skills: A series of meta-analyses. <i>Psychol Bull</i> . 2019;145(7):653-697.	Treatment focused-wrong intervention type.
56	Thomas R, Zimmer-Gembeck MJ. Behavioral outcomes of Parent-Child Interaction Therapy and Triple P-Positive Parenting Program: a review and meta-analysis. <i>J Abnorm Child Psychol</i> . 2007;35(3):475-95.	Treatment focused-wrong intervention type.
57	Thongseiratch T, Leijten P, Melendez-Torres GJ. Online parent programs for children's behavioral problems: a meta-analytic review. <i>European Child & Adolescent Psychiatry</i> . 2020;29:1555-1568.	Treatment focused-wrong intervention type.
58	Tarver J, Daley D, Lockwood J, Sayal K. Are self-directed parenting interventions sufficient for externalising behaviour problems in childhood? A systematic review and meta-analysis. <i>Eur Child Adolesc Psychiatry</i> . 2014;23(12):1123-37.	Treatment focused-wrong intervention type.
59	Turner W, Macdonald GM, Dennis JA. Behavioural and Cognitive Behavioural Training Interventions for Assisting Foster Carers in the Management of Difficult Behaviour. <i>Campbell Systematic Reviews</i> . 2007;3(1):1-77.	Treatment focused-wrong intervention type.
60	Watters C, O'Callaghan P. Mental health and psychosocial interventions for children and adolescents in street situations in low- and middle-income countries: A systematic review. <i>Child Abuse Negl</i> . 2016;60:18-26.	Treatment focused-wrong intervention type.
61	Werner CD, Linting M, Vermeer HJ, Van IJzendoorn MH. Do Intervention Programs in Child Care Promote the Quality of Caregiver-Child Interactions? A Meta-Analysis of Randomized Controlled Trials. <i>Prev Sci</i> . 2016;17(2):259-73.	Participant age group not of interest.
62	Woolfenden SR, Williams K, Peat J. Family and parenting interventions in children and adolescents with conduct disorder and delinquency aged 10-17. <i>Cochrane Database Syst Rev</i> . 2001;2001(2):CD003015.	Treatment focused-wrong intervention type.

Number	Reference	Reason for Exclusion
63	Wright B, Barry M, Hughes E, et al. Clinical effectiveness and cost-effectiveness of parenting interventions for children with severe attachment problems: a systematic review and meta-analysis. <i>Health Technol Assess.</i> 2015;19(52):vii-xxviii, 1-347.	Treatment focused-wrong intervention type.
64	Wright B, Hackney L, Hughes E, et al. Decreasing rates of disorganised attachment in infants and young children, who are at risk of developing, or who already have disorganised attachment. A systematic review and meta-analysis of early parenting interventions. <i>PLoS One.</i> 2017;12(7):e0180858.	Treatment focused-wrong intervention type.
65	Xie QW, Chan CHY, Ji Q, Chan CLW. Psychosocial Effects of Parent-Child Book Reading Interventions: A Meta-analysis. <i>Pediatrics.</i> 2018;141(4):e20172675.	Participant age group not of interest.
66	Zwi M, Jones H, Thorgaard C, York A, Dennis JA. Parent training interventions for Attention Deficit Hyperactivity Disorder (ADHD) in children aged 5 to 18 years. <i>Cochrane Database Syst Rev.</i> 2011;2011(12):CD003018.	Treatment focused-wrong intervention type.
67	Zych I, Ttofi MM, Farrington DP. Empathy and Callous–Unemotional Traits in Different Bullying Roles: A Systematic Review and Meta-Analysis. <i>Trauma, Violence, & Abuse.</i> 2019;20(1):3-21.	No outcomes of interest reported.

Appendix F: Characteristics of Included Studies Tables, by Domain

Table F1. Universal Prevention

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Aguirre et al.	2020	HIC/LMIC	Australia, US, Canada, UK, Malta, Malaysia, New Zealand, Jordan, Ireland, Brazil, the Netherlands, Portugal, Norway, Lebanon, Spain, Ireland, India, and Israel.	All study designs were eligible for inclusion	90	10-19 years old	Interventions targeting help-seeking behaviours for depression, anxiety, suicidal ideation, emotional distress, and general symptoms of mental illness.	There are a number of interventions being developed to promote help-seeking for mental health problems in adolescents, and most of them take place in high education settings. They include a range of delivery methods including psychoeducation, stigma and depression awareness campaigns, online tools and peer training. Since such initiatives are relatively new, there is a need for more trials, with longer follow-up periods and the use of reliable and validated tools focused in future help-seeking behaviour. Despite school seeming to be the ideal setting for deploying these interventions, it is important to consider adolescents outside the school system who may be in more need of attention for psychosocial and mental health problems.
Anderson et al.	2018	HIC	USA, Australia, Ireland, and Brazil	Cross-sectional, comparison group, cohort analytic studies, case-control, and RCTs	27	3-18 years old	Four main strategies were identified for inclusion: universal screening programs, curriculum-based models, staff in-service models, and teacher nomination. Additionally, traditional identification strategies were also included (i.e., office disciplinary referrals (ODRs), grade point average, attendance data, and teacher referral to identify students at risk of MHD).	Some evidence suggests that overall, universal screening may be the most effective method of identification; however, the rate of false-positive results yielded by this method is high, so the expectations of teachers, pupils, and parents would need to be managed accordingly. The current evidence-base is very limited and does not support the recommendation of any particular model. Well-designed pragmatic trials that include the evaluation of cost-effectiveness and detailed process evaluations are necessary to establish the accuracy of different models, as well as effectiveness in connecting pupils to appropriate support in real-world settings.
Arbesman et al.	2013	HIC/LMIC	-	Any study design where intervention was in domain of occupational therapy	124	3-21 years old	Interventions include those focused-on peer and social interaction, compliance with adult directives and social rules and norms, and participation in productive and task-focused behavior.	The results at the universal level provide occupational therapy practitioners with strong evidence to support providing occupation- and activity-based interventions in many areas, such as social-emotional learning programs and schoolwide programming to prevent bullying.
Barry et al.	2013	LMIC	India, Chile, South Africa, Mauritius, Uganda, Nepal, Palestine, Lebanon, Honduras, Egypt	RCT, quasi-experimental, cluster RCT	22	6-18 years old	Studies were eligible for inclusion if the intervention was designed to promote positive mental health for young people in LMIC settings.	The findings from the majority of the school-based interventions are strong. Structured universal interventions for children living in conflict areas indicate generally significant positive effects on students' emotional and behavioural wellbeing, including improved self-esteem and coping skills.
Baskin et al.	2010	HIC/LMIC	-	RCT	83	5-18 years old	The study had to be a psychotherapy intervention that evaluated mental health	The results point to psychotherapy benefiting student academics, regardless of age. Ethnically diverse participant groups in the studies fared better academically than did nondiverse groups. Implications discussed include counseling psychologists maintaining a holistic view of youth and of working more closely with educators.
Bennett et al.	2015	HIC	UK	RCTs, controlled clinical trials	46	0-18 years old	Any prevention intervention for DSM-5 anxiety disorders	Better use of primary studies in meta-analyses, including program-specific pooled effect size estimates and network meta-analysis is needed to guide evidence-informed anxiety prevention program choices. RCTs of innovative community/primary care-based interventions and web-based.
Browne et al.	2004	-	-	Reviews of RCTs or quasi-experimental studies	23	School-aged children	Non-clinical universal and early intervention health promotion initiatives for children at risk related to health and social welfare, recreation and culture, occupation, remedial	Prescriptive comments aim to inform service-providers, policymakers, and families about best practices for effective services such as: early, long-term intervention including reinforcement, follow-up and an ecological focus with family and community sector involvement; consistent adult staffing; and interactive, non-didactic programming adapted to gender, age and cultural needs. Gaps are identified in our

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
							education, housing, and corrections.	understanding of efficiencies that result from effective programs. Policy implications include the need to develop strategies for intersectoral interventions, including new financing arrangements to encourage (not penalize) interagency cooperation and, to ensure services reach appropriate segments of the population; replication of best practices; and publicizing information about benefits and cost savings.
Caldwell et al.	2019	HIC/LMIC	-	RCTs and quasi-randomized controlled trials	109	4-18 years old	Psychological, psychosocial, educational, or physical interventions that were implemented in educational settings to children and young people as individuals or in groups.	Considering unclear risk of bias and probable small study effects for anxiety, the study concluded there is little evidence that educational setting-based interventions focused solely on the prevention of depression or anxiety are effective. Future research could consider multilevel, systems-based interventions as an alternative to the downstream interventions considered here.
Calear et al.	2010	-	-	RCT	42	School-aged children	School-based early intervention programs for depression and to evaluate their effectiveness in reducing depressive symptoms.	Teacher program leaders and the employment of attention control conditions were associated with fewer significant effects. Further school-based research is required that involves the use of attention controls, long-term follow-ups and which focuses on the training and evaluation of sustainable program leaders, such as teachers.
Ciocanel et al.	2017	HIC	Ireland, USA, New Zealand, UK, Croatia	RCT	24	10 - 19 years old	This meta-analysis examined the effects of positive youth development interventions in promoting positive outcomes and reducing risk behavior.	Low- risk young people derived more benefit from positive youth development interventions than high-risk youth. The studies examined had several methodological flaws, which weakened the ability to draw conclusions.
Clarke et al.	2015	HIC	Australia, USA, Netherlands, UK, Israel, Norway, Ireland	RCT	28	12-25 years old	Studies were eligible for inclusion if the intervention was online and designed to promote positive mental health and/or prevent mental health problems of youth.	The results from the online prevention interventions indicate the significant positive effect of computerized cognitive behavioral therapy on adolescents' and emerging adults' anxiety and depression symptoms.
Corrieri et al.	2014	6- HIC 1-LMIC	Germany, Australia, USA, Canada, New Zealand, the UK and Chile	RCT	28	-	Studies not dealing with original data of depression and/or anxiety in school-based prevention interventions were excluded.	The majority of the reviewed school-based interventions shows effectiveness in reducing or preventing mental disorders in adolescents. However, effect size computation revealed only small-scale effectiveness.
Curran et al.	2017	-	-	-	23	Grade 6-12	School-based Positive youth development intervention	Evaluations indicate that programs increase intrapsychic measures of well-being in youth as well as social confidence and healthy behaviors. However, it is important to not only include "at-risk" persons in programming, because a mixed group of young people encourages a more positive peer-to-peer climate.
Currier et al.	2007	-	-	-	13	8–13 years old	Studies had to compare a bereavement intervention group to a no-treatment control group, thereby lessening the possibility that the simple passage of time accounted for positive outcomes.	A thorough quantitative review of the existing controlled outcome literature yielded a conclusion akin to earlier reviews of grief therapy with adults, namely that the child grief interventions do not appear to generate the positive outcomes of other professional psychotherapeutic interventions.
Dardas et al.	2018	HIC	Canada, USA, Australia	RCT	16	10–19 years old	Interventions that target depressive symptoms or disorders among adolescents and include parents as an integral component of the intervention, example: Cognitive-behavioural therapy (CBT), Systemic behaviour family therapy (SBFT).	Our review revealed a variety of promising approaches to utilize the parental and family contexts as a means of preventing or treating adolescent depression. However, more research is needed to determine which interventions, within what contexts, and using what resources will facilitate the best health outcomes for adolescents with depression and their parents.
Dray et al.	2017	HIC/LMIC	Australia, Ireland, Scotland, Germany, US, Norway, China, Canada, Switzerland,	RCT, cluster RCT	57	5-18 years old	Included trials assessed interventions that addressed at least 3 internal resilience protective factors.	The findings may suggest most promise for using universal resilience-focused interventions at least for short-term reductions in depressive and anxiety symptoms for children and adolescents, particularly if a cognitive-behavioral therapy-based approach is used.

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
			England, Chile, India, Netherlands, New Zealand, Mauritius, Italy					
Dunning et al.	2019	-	-	RCTs	33	≤ 18 years old	Mindfulness-based interventions (MBI) delivered over more than one session and where mindfulness was the central component of the intervention.	This meta-analysis reinforces the efficacy of using MBIs for improving the mental health and wellbeing of youth as assessed using the gold standard RCT methodology. Future RCT evaluations should incorporate scaled up definitive trial designs to further evaluate the robustness of MBIs in youth, with an embedded focus on mechanisms of action.
Ekeland et al.	2004	HIC/LMIC	Nigeria, USA, Canada, Australia	RCT	23	3–20 years old	Interventions with exercise alone or exercise as part of a comprehensive intervention and how they affect mental health.	The results indicate that exercise has positive short-term effects on self-esteem in children and young people. Since there are no known negative effects of exercise and many positive effects on physical health, exercise may be an important measure in improving children’s self-esteem.
Fazel et al. (a)	2014	HIC	-	-	-	4-17 years old	School-based mental health interventions	Mental health services when embedded within educational systems create a continuum of integrative care that can promote health, mental health, and educational attainment. Strategies to integrate the different tiers of interventions within a school, and use of resources from within the school, are probably the most sustainable.
Fazel et al. (b)	2014	LMIC	The Middle East, the Balkans, Asia, Africa, South America, and Romania	RCT, quasi-randomized controlled trials	22	6–12 years old and 11 years and older	The interventions used therapeutic methods broadly consisting of cognitive behavioural interventions (n=7, 32%), creative arts and relaxation techniques (n=5, 23%), and a mixture of cognitive and other approaches (n=10, 45%).	The available evidence, although scarce, provides support for mental health promotion interventions in LMIC schools. Interventions are more effective if they are more structured and have a longer duration. More than half of the interventions (n=12, 55%) had positive findings, three had positive findings only according to sex, and seven had no positive findings (32%). The most positive effects were found on post-traumatic stress disorder (PTSD) symptoms, with eight studies (36%) reporting improvements. Findings from only three studies showed substantial improvements in symptoms of depression, three recorded improvements in behaviour and conduct, and two noted improvement in symptoms associated with grief. Three studies reported negative effects of the interventions done.
Feiss et al.	2019	HIC	USA	RCTs, c-RCTs, quasi-experimental, one-group-pre-post, and blocked randomization studies.	42	11-18 years old	Middle or high school-based interventions that aimed at reducing stress, anxiety, depression, and other internalizing mental health-related problems.	Overall, stress interventions did not reduce stress symptoms, although targeted interventions showed greater reductions in stress than universal programs. Overall, anxiety interventions significantly reduced anxiety symptoms, however higher doses may be necessary for universal programs. Lastly, depression interventions significantly reduced depressive symptoms, but this reduction was moderated by a combination of program type, dose, race, and age group. Although, school-based programs aimed at decreasing anxiety and depression were effective, these effects are not long-lasting. Interventions aimed at reducing stress were not effective, however very few programs targeted or included stress as an outcome variable. Implications for practice, policy and research are discussed.
Fenwick-smith et al.	2018	HIC	Japan, USA, Denmark, UK, Norway, Canada, Netherlands, Lithuania	RCT, quasi-RCT	11	5-12 years old	Interventions adhere to the above definition of a universal program; be based in a primary school; focus on resilience and protective factors.	This review provides evidence that mental health promotion programs that focus on resilience and coping skills have positive impacts on the students’ ability to manage daily stressors.
Franklin et al.	2017	-	-	-	24	-	Interventions needed to examine effects of a teacher-delivered psychosocial intervention in a school setting on internalizing or externalizing mental health outcomes.	This study builds on existing literature that shows that teacher-delivered Tier 1 interventions are effective interventions but also adds to this literature by showing that interventions are more effective with internalizing outcomes than on the externalizing outcomes.
Gimba et al.	2020	LMIC	South Africa, Bosnia and Herzegovina, India, Kosovo, Nigeria, Mauritius,	Quasi-experimental, Solomon four group design, RCTs, mixed study design,	11	12-18 years old	Interventions that looked at modules of different mental health programs in secondary schools.	The systematic literature review indicated the unavailability of universal and comprehensive programs in LMICs. It showed that two programs were universal programs, and that no comprehensive programs were available, thus highlighting the need to develop comprehensive

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Citation	Year	HIC/ LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
			Thailand, and Palestine.	intervention study and a cross-sectional cohort study				SBMHP in LMIC settings. Furthermore, the systematic literature review revealed that one of the programs incorporated modules for parents.
Gwyther et al.	2019	HIC/ LMIC	Australia, USA, Turkey, Netherlands, Spain, Canada, Ireland, Israel, Balkans, Norway, New Zealand, Japan, South Africa, Mixed European and African centers	quasi-experimental, RCTs, non-RCT, longitudinal, experimental, pre-post intervention and cross-sectional study	40	Males 12-25 years	Masculinity focus was evaluated using the World Health Organization's classifications of gender-transformative, gender-sensitive, and gender-neutral health programs.	Of the included studies, 14 were male-focused programs, with masculinity approaches directed towards program aims and content information. The emergent trend indicated that male-targeted interventions may be more beneficial for young men than gender-neutral programs, however, none of these studies incorporated masculine-specific theory as an overarching framework. Furthermore, only three studies measured masculine-specific variables.
Hall et al.	2016	-	-	RCT, reviews, case control	48	0–16 years old	Interventions that use reading with or without a developmental disability to (in the presence of) dogs.	The evidence suggests that reading to a dog may have a beneficial effect on a number of behavioural processes which contribute to a positive effect on the environment in which reading is practiced, leading to improved reading performance.
Hetrick et al.	2016	HIC/ LMIC	USA, Australia, New Zealand, UK, Iran, Mexico, Netherlands, Canada, China, Iceland, Mauritius, Nigeria, Norway, South Korea	RCTs	83	8-24 years	Cognitive behavioural therapy (CBT), third-wave CBT and interpersonal therapy (IPT) based interventions for preventing depression in children and adolescents.	Overall the results show small positive benefits of depression prevention, for both the primary outcomes of self-rated depressive symptoms post-intervention and depression diagnosis up to 12 months (but not beyond).
Hoare et al.	2015	HIC/ LMIC	Fiji, USA, Australia, France, New Zealand, Tonga	RCT	7	0-19 years old	Overweight or obesity prevention interventions; community-based; targeted adolescent population; mental health measure reported at baseline and follow-up; included a comparison or control group.	It is recommended that future interventions incorporate mental health and well-being measures to identify any potential mechanisms influencing adolescent weight related outcomes, and equally to ensure interventions are not causing harm to adolescent mental health.
Hollis et al.	2017	-	-	Scoping reviews, narrative reviews, systematic reviews and meta-analyses	21	0-25 years old	Digital health interventions (DHIs) for improving mental health outcomes in children and young people; CBT.	Key methodological limitations make it difficult to draw definitive conclusions from existing clinical trials of DHIs. Issues include variable uptake and engagement with DHIs, lack of an agreed typology/ taxonomy for DHIs, small sample sizes, lack of blinded outcome assessment, combining different comparators, short-term follow-up and poor specification of the level of human support.
Johnstone et al.	2018	HIC/ LMIC	Mexico, Sweden, UK, Germany, Australia	RCT	14	0-13 years old	Interventions were a universal, school-based prevention program; the prevention program was based on psychological principles (e.g., educational or physical-based programs were excluded); interventions aimed to relieve depression.	The FRIENDS Program and programs which contained a greater number of sessions showed beneficial effects on anxiety and depressive symptoms. Universal programs aimed at preventing both anxiety and depression in children are limited.
Joronen et al.	2008	HIC	USA, UK, Canada, Australia, South Africa	RCT, quasi-RCT	9	6-18 years old	Intervention involved drama or theatre related methods as a sole or primary method in the programme, school-based and non-clinical groups.	In eight studies some positive effects or changes were reported, mostly concerning knowledge and attitudes related to health behaviour. The diversity of designs and instruments limited comparisons.
Joronen et al.	2017	HIC	UK, US, and Spain	RCTs, quasi-experimental, pre/post-test, post-test, mixed-methods, and qualitative studies	10	6-18 years old	Exergames or otherwise active video games (three were dance-based, three Wii activities and four interventions mixed different exergames).	Most of the studies reviewed found that exergaming had positive effects on self-concept, situational interest and motivation, enjoyment, psychological and social well-being, symptomatology, and different learning experiences. However, more research is required with better-validated instruments and follow-up research.

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Citation	Year	HIC/ LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Katz et al.	2013	-	-	All study designs	16	0-18 years old	A suicide prevention program in a school context measuring outcomes such as attitudes toward and knowledge about suicide, general skills training, help-seeking, and suicide behavior change.	There are few evidence-based, school-based suicide prevention programs, a combination of which may be effective. It would be useful to evaluate the effectiveness of general mental health promotion programs on the outcome of suicide.
Kieling et al.	2011	HIC/ LMIC	-	RCTs and Systematic reviews	-	0-19 years	Universal preventive interventions for child and adolescent mental health.	An increasing number of preventive strategies have been successfully tested in many LMIC. Whereas 90% of the children and adolescents live in LMIC, only 10% of the mental health randomized trials come from these countries. Packages and manuals (such as the mhGAP guide) are available for the management of childhood mental disorders in LMIC.
Klasen et al.	2013	LMIC	China, Iran, Jamaica, Brazil, Turkey, India, Uganda, Indonesia, Nepal, Rwanda, Sri Lanka, Poso, Bosnia, Palestine, South Africa, Vietnam, Thailand, Bangladesh, 1 multi centric study from Asia, Africa and Central America	RCTs, cluster RCTs and quasi RCTs	54	0-18 years	Child and adolescent mental health preventive and therapeutic interventions.	In behavioral disorders parent training is a highly promising intervention, which can successfully improve children's compliance and bring down rates of conduct problems significantly. In young children cognitive, emotional, and behavioral development can be enhanced through nutritional supplements and by stimulation through play, praise and reading. Trauma treatments can bring positive results even in severely traumatized children, who remain in unstable living conditions. In developmental disorders, there are successful prevention strategies as well as programs that bring children out of isolation and improve their independence. Some classroom-based interventions for adolescents have reduced symptoms of common mental disorders as well as risk taking behaviors.
Langford et al.	2015	HIC/ LMIC	UK, Norway, Finland, Spain, Australia, Switzerland, Mexico, Belgium, New Zealand, India, China, Germany, Netherlands, Tanzania	Cluster RCT	67	4-18 years old	Health Promoting Schools interventions had to include the following three elements: input into the curriculum; changes to the school's ethos or environment; and engagement with families and/or local communities.	We found positive average intervention effects for: body mass index, physical activity, physical fitness, fruit and vegetable intake, tobacco use, and being bullied. Intervention effects were generally small. On average across studies, we found little evidence of effectiveness for zBMI and no evidence for fat intake, alcohol use, drug use, mental health, violence and bullying others.
Lapalme et al.	2014	HIC	United States, Canada, UK, Spain	All study designs	19	12–18 years old	Neighbourhood interventions that promote PYD.	Results regarding interventions' characteristics promoting PYD confirm findings from past reviews. Our findings indicate that context is an important element of effective interventions. This review encourages future evaluations to analyze the role of context to build a better understanding of its role.
Lubans et al.	2016	HIC	Canada, USA, UK, Spain, Switzerland, Sweden, France, Norway, Portugal, Australia, China	experimental or quasi-experimental	25	5-18 years old	Any school-, home-, or community-based physical activity intervention or laboratory-based exercise intervention. Obesity prevention or treatment interventions that included a dietary component were not eligible for inclusion.	The strongest evidence was found for improvements in physical self-perceptions, which accompanied enhanced self-esteem in the majority of studies measuring these outcomes.
Melendez-Torres	2016	-	-	-	13	11-18 years old	Intervention focused on positive youth development (PYD); focused on prevention of smoking tobacco, alcohol consumption, drug use or violence.	Interventions were diverse in content and delivery. Our review suggests that existing PYD interventions subject to evaluation do not appear to have produced reductions in substance use of public health significance.
Oliver et al.	2008	HIC/ LMIC	USA 70%, 30% other areas of the world	RCT, systematic review, process review	33	11-21 years old	Interventions that aim to relieve and prevent mental health, associated factors or 'mediators' of mental health (e.g., self-esteem, self-concept, coping skills) or mental ill-health (e.g., anxiety, self-harm, anorexia).	No clear pattern for effectiveness emerged in terms of mental health promotion focus, the type of intervention, intervention provider or young people. Well-evaluated interventions neither always target what we know young people themselves see as important barriers to their mental health (for instance, loss of friends and family, violence and bullying) nor always build on what they see as key facilitators, particularly their preferred coping strategies.

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Pratt et al.	2002	-	-	RCT	12	9-23 years old	Interventions had a major focus on eating disorder prevention programs for children and adolescents, where there is no known DSM-IV diagnosis of an eating disorder.	The one significant pooled effect in the current review does not allow for any firm conclusions to be made about the impact of prevention programs for eating disorders in children and adolescents, although none of the pooled comparisons indicated evidence of harm.
Purewal et al.	2017	-	-	RCT, non-RCT, case-control, expert opinion	22	0-18 years old	Interventions that have components of pet ownership on emotional, cognitive, or behavioural development in children and adolescent without developmental disabilities.	The review found evidence for an association between pet ownership and a wide range of emotional health benefits from childhood pet ownership; particularly for self-esteem and loneliness. The findings regarding childhood anxiety and depression were inconclusive. Studies also showed evidence of an association between pet ownership and educational and cognitive benefits; Evidence on behavioral development was unclear due to a lack of high-quality research.
Raposa et al.	2019	-	-	RCT, quasi-RCT, before and after controlled studies	70	0-18 years old	Mentoring programs designed to improve youth outcomes through a caring, supportive relationship with a non-parental adult.	Taken together, these findings provide some support for the efficacy of mentoring interventions, while also emphasizing the need to remain realistic about the modest impact of these programs as currently implemented and highlighting opportunities for improving the quality and rigor of mentoring practices.
Rojas et al.	2019	HIC	Australia, Finland, Canada, USA, UK, Netherlands	RCTs	28	0-18 years	Evidence-based youth (i.e., infancy, pre-school age, school age, and adolescence) mental and behavioral health disorder preventive interventions conducted in or offered by primary care settings.	In this systematic review, we identified and described nineteen interventions across infancy, preschool age, school age, and adolescence. Of the 19 interventions, over half produced health benefits beyond usual primary care. However, there still is a gap in the availability of efficacious prevention programs in primary care, which may be due to important research questions not being addressed (e.g., the effect of clinic involvement on desired intervention outcomes or the benefit of preventive programs in a clinic setting above other settings). The authors encourage primary care providers, mental and behavioral.
Rose-Clarke et al.	2019	LMIC	South Africa, Tanzania, Thailand, India, Uganda, Philippines	RCTs	20	10-24 years old	Four types of interventions were included: 1) peer education where peers sought to increase adolescents' knowledge or influence their attitudes; 2) 'counselling', defined as peers providing support to help adolescents resolve personal or psychological problems; 3) 'activism' involving peer-led campaigns to change health-related policy; and 4) 'outreach' with peers engaging marginalised adolescents.	This review found some evidence that interventions improved mental health and reduced violence and substance use, but the diversity of components and outcomes prevented the ability to meta-analyze results and thus from making any definitive statements about effectiveness. Overall, no trials were found to have positive effects on HIV-related outcomes, results were heterogeneous for physical disorders and sexual and reproductive health outcomes, and no trials were found on infectious and vaccine preventable diseases, undernutrition, or injuries.
Salazar de Pablo et al.	2020	HIC/LMIC	-	Randomized and non-randomized studies that had both an intervention and a control group.	276	<35 years old (mean age=15, SD=7.4)	Universal or selective interventions were included in this review if they reported on mental health outcomes of interest. Interventions included psychoeducation; psychotherapy; physical therapy, exercise, and relaxation; and others.	The results of this study suggest that universal and selective promotion of good mental health outcomes (i.e., mental health literacy, emotions, self-perceptions and values, quality of life, cognitive skills, social skills, physical health, sexual health, academic/occupational performance and attitude towards mental disorders) in young people is feasible and may be effective.
Sanchez et al.	2018	-	-	RCTs	43	Elementary school-aged children (kindergarten through 5th grade)	Universal, selective, and targeted school-based interventions that targeted mental health problems. The service had to be implemented by school-based personnel.	Services delivered by school-based personnel collectively demonstrated a small-to-medium effect on child mental health problems, with particularly large effects associated with targeted interventions and selective prevention, services that included contingency management, services that were integrated into academic instruction, services that were implemented multiple times per week or daily, and services that targeted externalizing problems.
Schleider et al.	2017	-	-	RCT	50	0-18 years old	Single-session interventions (Psychotherapy or Systemic treatment) of mental disorders	Findings support the promise of single-session interventions (SSIs) for certain youth psychiatric problems and the need to

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
							and behavior problems in children and adolescents.	clarify how, to what degree, and for whom SSIs effect lasting change.
Schmidt et al.	2020	HIC	UK, Sweden, Australia, and 10 unnamed EU countries	Full health economic evaluations (including cost consequences analyses)	9	6-18 years old	Mental health promotion interventions/universal primary prevention interventions for mental and behavioural disorders (includes suicide prevention and anti-bullying interventions).	There were a small number of studies identified and they were all quite heterogeneous in nature thus limiting ability to make strong conclusions. There was some evidence to suggest that anti-bullying interventions in the school context may be a good use of resources, there was little evidence to suggest that school-based depression and anxiety prevention interventions were a good use of resources, and lastly there was very little information on suicide prevention programs and interventions occurring outside of the school setting.
Seedaket et al.	2020	HIC	Norway, Australia, Canada, US, and UK	RCTs	7	10-19 years old	Interventions that aimed to improve mental health literacy. School-based interventions included either an education stand-alone component and/or an education plus contact-based group intervention. Two studies reported on community-based interventions: one program called "Help Out a Mate" consisted of a 45-min workshop delivered to male athletes by volunteers who had experience of mental illness. The second program, called "In Our Own Voice," comprised of a weekly 60-min intervention at school that covered the following topics: (i) person's first experience with mental illness, (ii) how person accepted mental illness, (iii) what treatments worked for them, (iv) self-management for mental illness, (v) how to overcome mental illness.	The results of this review suggest that school-based interventions were likely to improve mental health literacy in adolescents. At the school level, the education stand-alone program was found to be more effective in improving mental health literacy compared to the education plus contact-based group intervention. At the community level, there was not enough data to conclude that community-based interventions are appropriate in improving mental health literacy for adolescents.
Shackleton et al.	2016	HIC/LMIC	USA, China, Canada, Italy, Germany, Norway, Finland, Japan, Netherlands, Australia, India, Denmark, Ethiopia, Brazil, Nigeria, Portugal	RCT, before and after studies	22	11-18 years old	School-based interventions aimed at improving the health and lifestyle of adolescents	There is good evidence that various whole-school health interventions are effective in preventing teenage pregnancy, smoking, and bullying.
Skeen et al.	2019	HIC/LMIC	-	RCTs, factorial and crossover trials.	158	10-19 years old	Universal, psychosocial interventions that were delivered either face-to-face, digitally, or combined modalities.	Overall, universally delivered interventions were found to improve adolescent mental health and reduce risky behavior. When discussing specific content-related components within interventions, there were 3 components in particular that led to positive effects across multiple outcomes: interpersonal skills training, emotional regulation, and alcohol and drug education.
Spruit et al.	2016	-	-	All study designs	57	-	Physical activity interventions with components that address on externalizing problems, internalizing problems, self-concept, and academic achievement in adolescents.	Overall, we found significant small-to-moderate effect sizes of physical activity interventions on externalizing problems, internalizing problems, self-concept, and academic achievement, indicating that the physical activity intervention groups benefited more than the comparison groups. Therefore, we conclude that physical activity interventions were effective in reducing externalizing and internalizing problems, and in improving self-concept and academic achievement.
Strong et al.	2005	-	-	-	50	6-18 years old	Interventions that implemented physical activity	School-age youth should participate daily in 60 minutes or more of moderate to vigorous physical activity that is

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
							to improve child health and behavior outcomes.	developmentally appropriate, enjoyable, and involves a variety of activities.
Taylor et al.	2017	-	USA	RCT, quasi-RCT	82	Kindergarten – High school	Positive youth development (PYD) focuses on enhancing young people’s strengths, establishing engaging and supportive contexts, and providing opportunities for bidirectional, constructive youth– context interactions.	Postintervention social-emotional skill development was the strongest predictor of well-being at follow-up. Infrequently assessed but notable outcomes (e.g., graduation and safe sexual behaviors) illustrate SEL’s improvement of critical aspects of students’ developmental trajectories.
Tejada-Gallardo et al.	2020	HIC	UK, Australia, Portugal, USA, Italy, and Israel	RCTs and non-randomized studies that used a control condition.	9	10-18 years old	School-based multicomponent positive psychology interventions aimed at improving well-being (psychological and subjective) indicators of mental health. The intervention had to target at least two components of well-being as part of the program.	The results of this review suggest that school-based multicomponent positive psychology interventions enhanced subjective and psychological well-being, reduced depression, and had no effect on anxiety in both the short and long-term.
Vallis et al.	2020	HIC/LMIC	North America, Europe, and Australia with only 3 studies from Asia and 1 from South America.	Any randomized or non-randomized study that included a control group	43	3-8 years old	Cognitive-behavioural or behavioural interventions for young children with anxiety and/or behavioural inhibition.	Cognitive-behavioural and behavioural interventions were found to reduce anxiety and behavioural inhibition in early childhood. CBT delivered in-person was found to be the most effective mode in reducing anxiety in young children.
Van Genugten et al.	2017	HIC	USA, Germany, Canada, Australia, UK, Israel, Spain, China, Korea, Iceland	-	40	12-18 years old	Described a self-regulation intervention that aimed at improving mental or psychological wellbeing or behaviour and that reported changes in wellbeing.	For primary interventions, there was not a single SRT that was associated with a greater intervention effect on internalising behaviour or self-esteem. No effects were found for externalising behaviours. Self-regulation interventions are moderately effective at improving mental wellbeing among adolescents.
Vanaken et al.	2018	HIC	Europe, Oceania, North America	Observational design	21	0-25 years old	Interventions that look at green space and see its effects on a child’s mental health.	Limited evidence suggests a beneficial association with mental well-being in children and depressive symptoms in adolescents and young adults. These beneficial association are resistant to adjustment for demographic and socio-economic confounders, which thus may represent independent links.
Watson et al.	2017	HIC	USA, Switzerland, Australia, Canada, Scotland, South Africa	RCT, quasi-RCT	39	5-12 years old	Classroom-based physical activity interventions.	Results suggest classroom-based physical activity may have a positive impact on academic-related outcomes. However, it is not possible to draw definitive conclusions due to the level of heterogeneity in intervention components and academic-related outcomes assessed.
Yonker et al.	2015	-	-	Interventional and observational designs	87	11-25 years old	On use of social media for interacting with adolescents and young adults to achieve positive health outcomes.	Social media technologies offer an exciting new means for engaging and communicating with adolescents and young adults; it has been successfully used to engage this age group, identify behaviors, and provide appropriate intervention and education.

Table F2. Bullying Prevention

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Cantone et al.	2015	HIC	USA, Australia, Finland, Switzerland, Belgium, The Netherlands	RCT	17	Grades 1-5 and 9-12	Interventions in schools that aim to reduce bullying and cyber-bullying	Programs aimed at reducing bullying can be effective in the short term, their long-term effectiveness has not been established, and there are important differences in the results based on gender, age, and socio-economic status of participants
Evans et al.	2014	HIC/LMIC	USA, Finland, Australia, UK, Germany, Turkey, China, Canada, Norway	Experimental and quasi experimental	32	Kindergarten to grade 10	Interventions in schools that aim to reduce bullying	Although the overall findings are mixed, the data suggest that interventions implemented outside of the United States with homogeneous samples are more successful than programs implemented in the United States, where samples tend to be more heterogeneous.
Fraguas et al.	2021	HIC/LMIC	Greece, Italy, UK, Indonesia, USA, Spain, China, Canada, Australia, Belgium, New Zealand, Netherlands, Austria, Brazil, Norway, Chile, Zambia, Finland, South Africa, Germany, Israel, Iran, Turkey, Romania, Poland	RCTs	69	4-17 years old	Anti-bullying interventions	Findings across 77 samples from 69 randomized clinical trials (111 659 participants), meta-analyses showed that interventions were statistically significantly effective in reducing bullying and improving mental health problems at study end point. Meta-regression analyses showed that duration of intervention was not statistically significantly associated with effectiveness and that the impact of the anti-bullying programs did not diminish over time during follow-up. Overall, findings of this meta-analysis support the concept that school anti-bullying interventions may have a valuable population impact.
Gaffney et al.	2019	-	-	Experimental and quasi experimental	24	4-18 years	Interventions in schools that aim to reduce cyber-bullying	Cyberbullying intervention programs are effective in reducing both cyberbullying perpetration and victimization. The results indicate that anti-cyberbullying programs can reduce cyberbullying perpetration by approximately 10%–15% and cyberbullying victimization by approximately 14%.
Gaffney et al.	2021	HIC/LMIC	Australia, UK, US, Germany, Canada, Netherlands, Spain, Austria, Norway, China, Zambia, Finland, Greece, Italy, Turkey, Romania, Hong Kong, Brazil, Cyprus, Malaysia	RCTs, before-after/quasi-experimental-control designs, other quasi-experimental designs, and age cohort designs	100 evaluations	4-18 years old	School-based antibullying programs	Overall, school-based antibullying programs are effective in reducing bullying perpetration and bullying victimization, although effect sizes are modest. The impact of evaluation methodology on effect size appears to be weak and does not adequately explain the significant heterogeneity between primary studies. Moreover, the issue of the under-/over-estimation of the true treatment effect by different experimental designs and use of self-reported measures is reviewed.
Jiménez-Barbero et al.	2016	HIC	Belgium, USA, Italy, Holland, Australia, Spain	RCT	14	7-16 years old	Any school-based anti-bullying programmes	In general, our results indicate that bullying and violence prevention programs in school settings are obtaining beneficial, albeit discrete, results in the outcome measures evaluated.

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Lancaster	2018	HIC	USA	-	11	0-18 years	Any school-based programme aimed at reducing cyber bullying amongst youth	While there is some encouraging evidence with the U.S. samples regarding improvements in attitudes toward cyberbullying, more research is needed to understand which interventions will effectively reduce actual cyberbullying behaviors.
Lee et al.	2015	HIC	UK, Australia, China, Germany, USA, the Netherlands, Finland, Belgium, Greece	Longitudinal cohort, RCT, controlled trial, or posttest only RCT designs	13	7-16 years	Interventions in schools that aim to reduce bullying	Studies involving training in emotional control ($p < .01$), peer counseling ($p < .05$), or the establishment of a school policy on bullying ($p < .05$) showed significantly larger ESs on victimization than did studies that did not involve these strategies. Effective school-based anti-bullying programs should include training in emotional control, peer counseling, and the establishment of a school policy on bullying.
Mishna et al.	2009	HIC	Region of the Americas	Experimental and quasi experimental	7	5-19 years old	School-based interventions that are related to increasing Internet safety knowledge, decreasing cyber bullying and decreasing risky online behavior.	Results provide evidence that participation in psychoeducational Internet safety interventions are associated with an increase in Internet safety knowledge but is not significantly associated with a change in risky online behaviour.
Nocentini et al.	2015	-	-	Experimental and quasi experimental	32	Preschool (2–5 years), school age (6–11 years), adolescence–young adulthood (from 12 years)	Interventions in schools that aim to reduce bullying through ICT mediation	Overall, considering the enormous development of digital tools and the importance of this experience for young students, the review underlines that ICT tools are generally under-used in prevention and intervention against bullying and cyberbullying.
Rawlings et al.	2019	HIC	North America	Quasi-experimental, RCT, pre-post-test	19 evaluations of 10 intervention programs	K-6th grade	Universal school-based only interventions; universal school-based interventions with community-wide components; and targeted interventions.	Little is known about bullying and victimization in schools. Interventions programs delivered in North America have not shown the same promise as interventions delivered in other continents. There is a lack of systematically reviewed evaluation programs.
Sivaraman et al.	2019	LMIC	Romania, Malaysia, South Africa	Pre-test/post-test experimental design with random allocation at individual level; Three-arm controlled intervention, randomized at the school level; Pre-test/post-test experimental design with non-random allocation at school level	3	10-19 years	Interventions that reduce and prevent bullying among adolescents in low- and middle-income countries	Results from all three studies were mixed and provided no overall evidence of effect for the interventions. Given the well-established evidence base for anti-bullying interventions in HICs, there is an urgent need for more rigorously evaluated and reported studies in LMICs, adapted for contexts of considerable resource constraints.
Ttofi et al.	2009	HIC/LMIC	Austria, Italy, Canada, England, Australia, USA, Netherlands, Finland,	Randomized experiments, before-and-after quasi-experimental designs, other quasi-	53 studies in review; 44 studies in meta-analyses	Kindergarten to high school	Anti-bullying programs in schools.	Overall, school-based anti-bullying programs are effective in reducing bullying and victimization (being bullied). On average, bullying decreased by 20% – 23% and victimization decreased by 17% – 20%.

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
			Korea, South Africa, Germany, Switzerland, Greece, Spain, Norway, Czechoslovakia, Belgium, New Zealand, Finland, Ireland	experimental designs, and age-cohort designs				
Vreeman et al.	2007	HIC/LMIC	Italy, UK, US, Czechoslovakia, Belgium, Switzerland, Australia, Norway, Canada, South Africa	Pretest, posttest; randomized matched pairs; quasi-experimental; age-cohort; cohort study	26	K-12 th grade	Interventions in schools that aim to reduce bullying	Many school-based interventions directly reduce bullying, with better results for interventions that involve multiple disciplines

Table F3. Substance Abuse Prevention

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Allen et al.	2016	HIC/LMIC	-	RCTs	42	10-19 years old	Parent-focused interventions in reducing or preventing adolescent tobacco, alcohol, and illicit substance use. Involved parent training with focus on imparting parenting knowledge, skills, practices, or behaviours.	Results of this review suggest that parenting interventions are effective at preventing and decreasing adolescent tobacco, alcohol, and illicit substance use over both the short and long term.
Boumparis et al.	2019	HIC	USA, Australia, Canada	RCTs	30 (10 prevention interventions)	12-20 years old in prevention interventions	Short- and long-term effects of digital prevention and treatment interventions for cannabis use reduction.	Digital prevention and treatment interventions showed small, significant reduction effects on Cannabis use in diverse target populations at post-treatment compared to controls. For prevention interventions, the post-treatment effects were maintained at follow-up up to 12 months later.
Carson et al.	2011	HIC	USA, Australia, UK, India, Finland. One study included six countries (Denmark, Finland, Netherlands, Portugal, Spain, and UK)	RCTs and Controlled Clinical Trials	25	≤25 years old	Multi-component community-based interventions in influencing smoking behavior.	There is some evidence to support the effectiveness of community interventions in reducing the uptake of smoking in young people, but the evidence is not strong and contains a number of methodological flaws.
Carson-Chahhoud et al.	2017	HIC	USA, Norway	RCTs, controlled trials without randomization and interrupted time-series studies	8	≤25 years old	Mass media prevention effort directed at young people to prevent smoking.	Certainty about the effects of mass media campaigns on smoking behaviour in youth is very low, due to inconsistency between studies in both design and results, and due to methodological issues amongst the included studies.
Coppo et al.	2014	LMIC	China	c-RCT	1	13-15 years old	Primary and secondary schools were randomized to receive different levels of smoking policy or no intervention.	Despite a comprehensive literature search, and rigorous evaluation of studies, we found no evidence to support School Tobacco Policies.
Espada et al.	2015	HIC	Spain	Experimental, or quasi-experimental, design with pretest-post-test and/or follow-up measures.	21	10-19 years old	Drug abuse prevention programs.	The programs were most effective in changing attitudes towards drugs. Models of health education and social learning were effective, especially in combination with oral, written, and audiovisual support material and the implementation of joint programs by health education professionals and faculty members.
Faggiano et al.	2008	HIC	USA, UK	RCT	29	Primary and secondary school students	Any intervention program vs. a control condition (usually curricular activities or another school-based drug prevention program) designed to prevent substance use in a school setting were considered	Skills-based interventions are better than affective ones in improved self-efficacy. No differences are evident for skills vs. knowledge focused programs on drug knowledge. Affective interventions improve decision-making skills and drug knowledge to a higher degree than knowledge-focused programs.
Faggiano et al.	2014	HIC/LMIC	USA, Australia, UK, China, South Africa, Hong Kong, Hawaii, and the Czech Republic	RCT	51	6-18 years old	School-based interventions aimed at reducing drug use.	School programmes based on a combination of social competence and social influence approaches showed, on average, small but consistent protective effects in preventing drug use, even if some outcomes did not show statistical significance.
Foxcroft et al.	2011	HIC/LMIC	US, India, the Netherlands, Australia	RCT	20	0-18 years old	Universal multi-component prevention programs in preventing alcohol misuse in school-aged children.	12 of the 20 trials showed some evidence of effectiveness compared to a control or other intervention group, with persistence of effects ranging from 3 months to 3 years. Of the remaining 8 trials, one trial reported significant effects using one-tailed tests and 7 trials reported no significant effects of the multi-component interventions for reducing alcohol misuse.

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Foxcroft et al.	2011	HIC	USA, Netherlands	RCT	12	0-18 years old	Universal family-based prevention programs in preventing alcohol misuse in school-aged children.	In conclusion, in this Cochrane systematic review we found that the effects of family-based prevention interventions are small but generally consistent and also persistent into the medium-to longer-term.
Garcia-Huidobro et al.	2018	HIC/LMIC	-	RCTs	38	10-19 years old	Universal parenting-based prevention programs that focused on reducing youth substance abuse.	Overall, interventions including male and female youth and youth in early adolescence (age 10 to 14 or in 5 th to 8 th grade) were more beneficial than interventions including female-only or both young and older adolescents. Programs tailored to specific racial/ethnic groups, as well as programs designed for youth from multiple races/ethnic groups were effective. Current evidence supports the benefits of offering parenting guidance to all families with adolescent children, regardless of the gender, age, or race/ethnicity of the adolescent.
Gilligan et al.	2019	HIC/LMIC	USA, Netherlands, Sweden, Poland, Germany, India	RCTs and cluster RCTs	46	0-18 years old	Family- or parent-based programs as a way of preventing or reducing alcohol use in school-aged children.	The results of this review indicate that there are no clear benefits of family-based programs for alcohol use among young people. Patterns differ slightly across outcomes, but overall, the variation, heterogeneity, and number of analyses performed preclude any conclusions about intervention effects
Hefler et al.	2017	HIC	Germany, Netherlands, Finland, Switzerland, Canada, USA	RCTs and Controlled trials	8	11-14 years old	Incentive programs to prevent smoking initiation among youth. Our definition of an incentive was any tangible benefit externally provided with the explicit intention of preventing smoking. This includes contests, competitions, incentive schemes, lotteries, raffles, and contingent payments to reward not starting to smoke, thereby remaining a non-smoker. We included rewards to third parties (e.g., to schools, healthcare providers or family members), as well as interventions that directly rewarded children and adolescents	The very limited evidence currently available suggests that incentive programs do not prevent smoking initiation among youth. However, there are relatively few published studies, and these are of variable quality.
Hutton et al.	2020	HIC/LMIC	Uruguay, Netherlands, Italy, Australia, France, Sweden, Belgium, Switzerland, UK, USA, New Zealand	RCTs and cross-sectional studies	18	12-26 years old	Interventions delivered by mHealth (social networking sites, SMS, and mobile phone applications) to young people.	Review provides some evidence for the effectiveness of mHealth technology to reduce risky drinking amongst young people. SMS messaging had the greatest efficacy amongst the interventions reviewed in this population. Interestingly, young people did not mind being interrupted by text messages as part of an intervention. Findings suggest that young people liked personalized messaging, and this in itself created an effective way to convey mHealth messaging.
MacArthur et al.	2018	HIC/LMIC	USA, Switzerland, England, Sweden, Australia, Ireland, Spain, Mexico, South Africa, Canada, India, Hong Kong, UK	RCTs, cluster RCTs	70	8-18 years old (but included outcomes until 25 years)	Intervention aimed to address involvement in multiple risk behaviors among children and young people up to 18 years of age.	Available evidence is strongest for universal school-based interventions that target multiple-risk behaviours, demonstrating that they may be effective in preventing engagement in tobacco use, alcohol use, illicit drug use, and antisocial behaviour, and in improving physical activity among young people, but not in preventing other risk behaviours.
O'Connor et al.	2020	HIC	Australia, Canada, Switzerland, Czech Republic, Germany, Netherlands,	Randomized clinical trials (RCTs), including cluster randomized	29	Children , adolescents, and	Universal prevention of drug use.	The evidence for behavioral counseling interventions to prevent initiation of illicit and nonmedical drug use among adolescents and young adults was inconsistent and imprecise, with some interventions associated with

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
			Poland, Sweden, United States	trials, and nonrandomized controlled intervention studies		young adults (aged <25 years)		reduction in use and others associated with no benefit or increased use. Health, social, or legal outcomes such as mental health symptoms, family functioning, consequences of drug use, and arrests were reported in 19 trials and most showed no group differences.
Stockings et al.	2016	-	-	RCT, quasi-experimental	-	10-24 years old	Interventions that aimed for prevention, early intervention, harm reduction, and treatment of problem use in young people for tobacco, alcohol, and illicit drugs.	Scarce availability of research on interventions for problematic substance use in young people indicates the need to test interventions that are effective with adults in young people.
Thomas et al.	2011	HIC	USA	RCT	4	9-16 years old	Interventions in school that use mentoring to prevent adolescent alcohol/drug use.	The ability of the interventions to be effective was limited by the low rates of commencing alcohol and drug use during the intervention period in two studies.
Thomas et al.	2013	HIC/LMIC	USA, Netherlands, UK, Canada, Germany, China, India, Australia, Mexico, Norway, Romania, Belgium, Czech Republic, Denmark, Finland, Greece, Portugal, South Africa, Thailand, Austria, Belgium, Greece, Italy, Spain, Sweden	RCTs	134	5-18 years old	All school-based programmes that had as one of their goals preventing tobacco use, irrespective of theoretical intervention. Some programmes aimed simply to provide information about tobacco. Others had more complex goals: teaching generic social skills to reinforce societal norms about individual behaviour; reinforcing the adolescent's self-concept; and teaching social skills and specific tobacco refusal skills.	Pure Prevention cohorts showed a significant effect at longest follow-up, with an average 12% reduction in starting smoking compared to the control groups. The combined social competence and social influences interventions showed a significant effect at one year and at longest follow-up. Studies that deployed a social influences program showed no overall effect at any time point.
Thomas et al.	2015	HIC/LMIC	USA, Australia, India, Netherlands, Norway.	RCTs	27	5-18 years old	Interventions with children and family members intended to deter starting to use tobacco. The family-based intervention could include any components to change parenting behaviour, parental or sibling smoking behaviour, or family communication and interaction.	There is moderate quality evidence to suggest that family-based interventions can have a positive effect on preventing children and adolescents from starting to smoke. There were more studies of high intensity programmes compared to a control group receiving no intervention, then there were for other comparisons. The evidence is therefore strongest for high intensity programmes used independently of school interventions. Programmes typically addressed family functioning and were introduced when children were between 11 and 14 years old. Based on this moderate quality evidence a family intervention might reduce uptake or experimentation with smoking by between 16 and 32%.
Tremblay et al.	2020	HIC/LMIC	USA, Australia, Germany, China and 7 European Countries	RCT, cluster RCT and Quasi experimental	90	6-18 years old	Effectiveness of a substance use prevention programs delivered to school-aged children and youth aimed at preventing the use of psychoactive substances. Programs evaluated with the largest combined sample sizes were Drug Abuse Resistance Education, Project Adolescent Learning Experiences Resistance Training, Life Skills Training (LST), the Adolescent Alcohol Prevention Trial, and Project Choice.	The most research has been conducted on the Life Skills Training (LST) program. However, as with other programs included in this review, studies of LST effectiveness varied in quality.
Valdez et al.	2020	HIC/LMIC	USA, Canada, Bosnia	Mixed methods, cross sectional, and program	15	10-24 years old	Youth Participatory Action Research (YPAR) for youth substance use prevention.	Our findings indicated that youth participation in research and social action resulted in increased community awareness of substance use and related solutions. This supports the

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Citation	Year	HIC/ LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
				evaluation studies				premise of youth participation as an agent of community change by producing community-specific substance use data and prevention materials.

Table F4. Self Harm

Citation	Year	HIC/ LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Torok et al.	2019	HIC	USA, Germany, Israel, Australia	RCTs, Quasi experimental and non-experimental design	13	-	Suicide prevention gatekeeping training programs for teachers and parents.	Significant moderate-to-large intervention effects were reported for suicide literacy outcomes among teachers and parents, with the largest gains among those with lowest baseline scores. No improvements in identification and referral behaviors among gatekeepers were noted.
Morken et al.	2019	-	-	Systematic reviews	8	0-18 years	Any intervention aimed at preventing or reducing self-harm and suicide, including psychological therapy, pharmaceutical interventions, psychosocial interventions, physical activity, or nutrition.	Moderate certainty evidence suggests that school-based interventions prevent suicidal ideation and attempts short term, and possibly suicide attempts long term. The effects of community-based interventions following suicide clusters and local suicide plans are unknown, as are the benefits and harms of screening young people for suicide risk.

Table F5. Responsive Caregiving & Safety and Security

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Barlow et al.	2006	HIC	USA, Germany, Canada	RCTs	7	0-19 years old	Studies evaluating the effectiveness of brief (i.e., between 6 and 30 weeks) individual or group-based parenting programmes that were provided on a targeted basis (i.e., to parents with a history of abuse or at high-risk of abuse) with a view to preventing the (re)occurrence of child maltreatment.	This review found insufficient evidence to support the use of parenting programmes to treat physical abuse or neglect. There is, however, limited evidence to show that some parenting programmes may be effective in improving some outcomes that are associated with physically abusive parenting, but further research is urgently needed.
Burkey et al.	2018	HIC/LMIC	Thailand, Jamaica, Sierra Leone, Uganda, Romania, Brazil, South Africa, China, Argentina, DRC, Panama, Jordan, Bolivia, Liberia, Iran, Indonesia, and Sri Lanka	c(RCTs)	24	0-18 years old	'Active' psychosocial interventions that primarily targeted children, parents, families, or teachers. The review considered psychosocial interventions to include any nonpharmacological intervention focused on psychological or social factors, including, but not limited to, individual, family or group psychological therapies; education; training; or guidance.	The results of this review suggest that the use of psychosocial interventions are a feasible and effective way to reduce disruptive behaviour problems among children in LMIC. The study provides strong evidence for child-focused and behavioural parenting interventions, interventions across age ranges and interventions delivered in groups.
Coore Desai et al.	2017	HIC/LMIC	-	Systematic reviews	28	-	Interventions had to target child maltreatment preventions, general parenting skills and the early childhood years.	The findings suggest that parenting programmes have the potential to both prevent and reduce the risk of child maltreatment. However, there is a lack of good evidence from LMICs where the risk of child maltreatment is greatest.
Eshel et al.	2006	HIC/LMIC	USA, South Africa, Jamaica, Colombia, Netherlands, and Brazil	Experimental studies or correlative studies	50	-	Responsive parenting interventions	The results of this review suggest that interventions are effective in enhancing maternal responsiveness, resulting in better child health and development, especially for populations in greatest need. Since these interventions were feasible even in poor settings, they have great potential in helping us achieve the Millennium Development Goals. We suggest that responsiveness interventions be integrated into child survival strategies.
Finch et al.	2021	HIC/LMIC	US, Canada, Germany, UK, Turkey, Ireland, China, Spain, Netherlands, Uganda, Australia, Ecuador, Indonesia, Jamaica, Malaysia, Romania, Taiwan, Tanzania	RCTs, nonrandomised trials, controlled before-and-after studies, quasi-experimental studies, and systematic reviews	73 (62 primary effectiveness studies and 11 systematic reviews)	< 18 years old	Interventions addressing institutional child maltreatment	This EGM has highlighted a substantial need for more high-quality studies that evaluate interventions across a broader range of institutional contexts and maltreatment types. The current evidence base does not represent countries with large populations and the greatest incidence of child maltreatment. Few studies focussed on perpetrators or the organisational environment. Further evidence gaps were identified for interventions relating to disclosure, organisational responses and treatment, and few studies assessed interventions targeting perpetrators' maltreatment behaviours, recidivism, or desistance. Future studies should also include measure of programme implementation.
Gonzalez et al.	2018	HIC	USA, Australia, Sweden, and Germany	Experimental studies with randomised allocation to at least two different conditions.	8	2-8 years old	Any engagement strategy designed to enhance parental engagement at the initial stages of an intervention for parents, regardless of intervention characteristics. Parenting interventions were defined as ones, which provided both information and skills training for parents in terms of child development,	Of the engagement strategies tested in included studies (monetary incentive, setting, testimonial, advertisement, and engagement package), three strategies (advertisement, incentive, and engagement package) showed a significant effect on a stage of engagement, but none across stages. The low methodological quality of the selected studies limits their generalisability and thus provides limited evidence regarding effective engagement strategies to increase recruitment, enrolment, and first attendance rates in parenting interventions.

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Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
							child behaviour, or parenting. Interventions providing information only were not included.	
Himestra et al.	2017	HIC	US, the Netherlands, Taiwan, New Zealand, Canada, and Finland	Longitudinal studies	42	12-17 years old	Smoking-specific parenting practices (i.e., perceived parental norms and influences, smoking-specific monitoring, availability of cigarettes at home, household smoking rules, non-smoking agreements, smoking-specific communication, and parental reactions).	Overall, the results of this review suggest the effectiveness of smoking-specific parenting, however the number of studies was too limited and further research is required.
Jago et al.	2013	HIC	US, Canada, Italy, Belgium, Australia, China, Puerto Rico, Netherlands, and the UK.	All peer-reviewed studies	29	6 months old to 20 years old	Interventions that are parent-focused, examining parenting practices or parenting styles, and aim to reduce child or adolescent screen-viewing time.	There is mixed evidence that parenting styles and media-related parenting practices are associated with youth SV. The assessment of parental influence of youth media use is hampered by the diversity of measures that have been used. There is a need for new measures that assess a range of media parenting practices that are relevant to multiple forms of SV.
Leijten et al.	2016	HIC/LMIC	US, Canada, Hong Kong, Sweden, Portugal, Norway, Switzerland, UK, Germany, Iran, Netherlands, Ireland, Panama, Australia, Indonesia, Belgium, Puerto Rico, Liberia, and Israel.	RCTs	129	2-9 years old	Parenting interventions based on behavioral/social learning theory. Authors included trials that compared a parenting intervention (comprising techniques largely based on the principles of social learning theory) to a control condition.	Overall, parenting interventions based on the same principles were found to lead to similar outcomes, whether transported or homegrown. This finding supports the selection of interventions based on their evidence base, rather than on cultural specificity.
Macbeth et al.	2015	HIC	Scotland, Russia, Ireland, New Zealand,	RCT, case-control	8	0-18 years old	Mellow Parenting interventions for parent-child dyads at high risk of adverse developmental outcomes.	Our data give some support to claims for effectiveness of Mellow Parenting as a group intervention for families with multiple indices of developmental adversity. Given the methodological weaknesses of literature in the area, novel approaches are needed in future trials of low-budget complex interventions in non-commercial settings.
Medlow et al.	2016	HIC	Australia, US, Israel, and the Netherlands	RCTs	9	10-18 years old	Parenting interventions that had to be structured, repeatable and deliverable within a community context for the treatment of challenging behaviour in adolescents.	Results indicated that intervention group parents typically made greater gains than did control group parents on measures of good parenting, with positive flow-on effects to some aspects of challenging adolescent behaviours. Limited evidence suggests that group and individual intervention formats may be equally effective and that there is no advantage to the participation of the target adolescent in the intervention.
Poole et al.	2014	HIC	USA, Australia, UK, New Zealand, Canada, Japan	RCT, survey at mid- or post-intervention, Pre- and mid- or post-intervention, one group, Simple time series, Time series with comparison group, Non-equivalent groups, pre- and post-intervention,	17	-	universal campaigns targeting child physical abuse prevention	The evidence base for universal campaigns designed to prevent CPA remains inconclusive due to the limited availability of rigorous evaluations; however, Triple-P is a notable exception.

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
				survey with timing ambiguous in relation to the campaign				
Sanders et al.	2014	HIC/LMIC	Australia, Germany, UK, USA, Switzerland, Hong Kong, New Zealand, Netherlands, Japan, Belgium, Canada, Panama, Iran,	RCTs, cluster-RCTs, quasi-experimental, uncontrolled trials, population level trials, case studies	116	0-18 years	effects of the multilevel Triple P-Positive Parenting Program system on a broad range of child, parent, and family outcomes.	The present findings highlight the value of an integrated multilevel system of evidence-based parenting programs and raise the real prospect that a substantially greater number of children and parents can grow up in nurturing family environments that promote children's development capabilities throughout their lives.
Smith et al.	2020	HIC	UK, USA, Australia, Norway, Canada, Netherlands	RCTs and Quasi-experimental	40	0-18 years	parenting programs to improve child and adolescent mental, emotional, and behavioral health outcomes that were either delivered in the context of pediatric primary care or coordinated with primary care through systematic referrals to services provided in other settings.	Parenting interventions delivered and implemented with fidelity in pediatric primary care could result in positive and equitable impacts on mental, emotional, and behavioral health outcomes for both parents and their children. Future research on the implementation strategies that can support adoption and sustained delivery of parenting interventions in primary care is needed if the field is to achieve population-level impact.
Valentine et al.	2019	HIC	USA, UK	RCTs	10	5-9 years	Families and Schools Together (FAST) program	Evidence on the effectiveness of being assigned to FAST is of moderate to low certainty and does not suggest that being assigned to FAST confers important benefits for students and their families.
Vlahovico va et al.	2017	HIC	USA, Canada	RCTs	14	0-18 years	parenting programs for reducing rates of physical abuse recidivism	Overall, this review presents evidence supporting the effectiveness of parenting behavioral programs based on social learning theory for reducing hard markers of child physical abuse recidivism.
Walsh et al.	2015	HIC/LMIC	USA, Canada, China, Germany, Spain, Taiwan, Turkey	RCTs, cluster RCTs and Quasi-experimental	24	5-18 years old	School-based education programs for the prevention of child sexual abuse.	The studies included in this review show evidence of improvements in protective behaviors and knowledge among children exposed to school-based programs, regardless of the type of program. Program participation does not generate increased or decreased child anxiety or fear, however there is a need for ongoing monitoring of both positive and negative short- and long-term effects.

Table F6. Early Learning & Positive Development

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Bastounis et al.	2016	HIC	Australia, the Netherlands, and USA	RCTs and cluster RCTs	9	8-17 years old	School-based Penn Resiliency Programme (PRP) or any of its derivatives, targeting depression and (or) any of the secondary outcomes of interest	No evidence was found in support of the effectiveness of PRP or its derivatives in reducing depression or anxiety and improving explanatory style.
Bungay et al.	2013	HIC/LMIC	UK, USA, Canada, Australia, and Tanzania	Qualitative or quantitative, mixed and/or multi-method research	20	11-18 years old	Creative activities (music, singing, drama, visual arts, theatre and arts) that took place in a community setting.	It was found that participating in creative activities can have a positive effect on behavioural changes, self-confidence, self-esteem, levels of knowledge and physical activity.
Cahill et al.	2020	-	-	RCTs, quasi-experimental, and pretest-post-test studies.	62	5-21 years old	Activity- or occupation-based interventions: (1) outdoor groups and camps, (2) video and computer games, (3) productive occupations and life skills, (4) meditation, (5) animal-assisted interventions, (6) creative arts, (7) play, (8) sports, and (9) yoga.	Substantial evidence exists to support the use of activity- and occupation-based interventions to address the mental health, behavioral, and social participation concerns of children and youth. Occupational therapy practitioners should match the desired outcome of therapy with the appropriate intervention to provide the best and most effective services to their clients.
Catalano et al.	2019	LMIC	Uganda, Cambodia, Iran, India, South Africa, China, Vietnam, Panama, Ghana, Malaysia, Mexico, Romania, Jordan, Palestine, Democratic Republic of Congo, Kenya, Rwanda, Peru, Dominican Republic, Zimbabwe, Bangladesh, Ecuador, Chile	Experimental and quasi-experimental evaluations	108	10-29 years old	Positive youth development (PYD) programs. To be included, a program had to address more than one PYD construct or address one PYD construct across multiple socialization domains (e.g., home, school, and peers).	Sixty percent of programs evaluated demonstrated positive effects on behaviors, including substance use and risky sexual activity, and/or more distal developmental outcomes, such as employment and health indicators.
Dowdall et al.	2019	HIC/LMIC	US, Hong Kong, Australia, South Africa, Brazil, and Turkey	RCTs	19 RCTs from 20 papers	1-6 years old	Shared picture book readings interventions. Interventions designed to promote techniques involved in effective book sharing (regardless of whether the intervention was described as “dialogic reading” or “interactive reading”).	The interventions had a small effect on expressive and receptive language, and a large effect on caregiver book-sharing competence. The impact of the intervention on child language was moderated by intervention dosage, with lower dosage associated with a minimal impact. Overall, the results of the review confirm the promise of book-sharing interventions for enhancing and accelerating child language development.
Durlak et al.	2007	-	87% of studies were in the US	-	526	5-18 years old	Positive youth development (PYD) programs with a focus on social systems.	Several statistically significant effects were found, supporting attempts to change social systems. Future work should measure more thoroughly the extent to which the systemic changes that are targeted through intervention are achieved, and investigate how such changes contribute to the development and sustainability of the outcomes that might be demonstrated by participants of competence promotion programs.
Durlak et al.	2011	-	-	47% of studies incorporated a randomized design	213	5-18 years old	School-based universal social and emotional learning (SEL) programs.	Compared to controls, SEL participants demonstrated significantly improved social and emotional skills, attitudes, behavior, and academic performance. The use of recommended training practices (SAFE practices) moderated outcomes. Overall, the findings from this review highlight the positive impact of SEL programs

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Durlak et al.	2010	HIC	USA	Randomized and quasi-experimental designs	68	5-18 years old	After-school programs (ASP). An ASP in this meta-analysis was defined as an organized program offering one or more activities that: (a) occurred during at least part of the school year; (b) happened outside of normal school hours; and (c) was supervised by adults.	Compared to controls, participants demonstrated significant increases in their self-perceptions and bonding to school, positive social behaviors, school grades and levels of academic achievement, and significant reductions in problem behaviors. The presence of four recommended practices associated with previously effective skill training (SAFE: sequenced, active, focused, and explicit) moderated several program outcomes. One important implication of current findings is that ASPs should contain components to foster the personal and social skills of youth because youth can benefit in multiple ways if these components are offered. The second implication is that further research is warranted on identifying program characteristics that can help us understand why some programs are more successful than others.
Hodder et al.	2017	HIC/LMIC	US, Australia, Hong Kong, Croatia, and Sweden	RCTs and c-RCTs	19	5-18 years old	Universal school-based resilience intervention	Overall intervention effects were evident for illicit substance use, but not tobacco or alcohol use. Evidence supports the implementation of universal school-based interventions that address 'resilience' protective factors to reduce adolescent illicit substance use, however, suggest alternate approaches are required for tobacco and alcohol use.
Jackson et al.	2016	-	-	RCTs	8	7-12 years old	Exercise programs (structured program of increased physical activity at least 1 month in duration)	All studies showed a positive effect of regular exercise with improvements in measures of inhibitory control, but none were statistically significant for this measure. When pooled, the model revealed a small improvement of inhibitory control with long-term physical activity. This finding provides support for the important interaction between exercise and cognitive functioning.
Klingbeil et al.	2017	HIC/LMIC	US, Canada, Europe, Australia, Asia	RCTs, quasi-experimental designs, and pre-post designs	76	Mean or median age ranged from 3.9 to 17.7 years old	Mindfulness-based interventions that were group-based. Any treatment that intentionally trains mindfulness skills (i.e., self-regulation of attention on immediate experience paired with an accepting attitude toward one's experience) as the core therapeutic component for reducing problem behavior or increasing wellbeing behavior.	Mindfulness-based interventions were associated with small treatment effects, which were larger at follow-up than post-treatment. Small, positive effects were observed across therapeutic process and outcome domains.
Liu et al.	2015	HIC/LMIC	US, Australia, UK, China, Netherlands, Sweden, Canada, Germany, Israel, Portugal, South Africa, Spain, and Switzerland	RCTs and non-RCTs	38	3-20 years old	Physical activity (PA) interventions. The intervention had to be supervised PA or PA combined with other strategies.	Findings suggest that physical activity interventions improve self-concept and self-worth in children and adolescents. Stronger associations were found when interventions were school- and gymnasium-based compared to other settings.
Maynard et al.	2017	HIC/LMIC	Canada, US, Australia, Europe and Asia	RCTs, quasi-experimental design (QED), single group pre-post-test design (SGPP) or single subject design (SSD).	35	Pre-school, primary and secondary school students (mean age= 12.64 years)	Mindfulness-based interventions for improving cognition, academic achievement, behavior, and socioemotional functioning of primary and secondary school students.	Mindfulness based interventions have a small, statistically significant positive effect on cognitive and socio-emotional outcomes. But there is not a significant effect on behavioral and academic outcomes. There was little heterogeneity for all outcomes, besides behavioral outcomes, suggesting that the interventions produced similar results across studies on cognitive, socio-emotional and academic outcomes despite the interventions being quite diverse.

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citation	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Melendez-Torres et al.	2018	HIC	UK, Australia, and the US	RCT	7	4-18 years old	School-based health curriculum interventions that aimed to integrate health and academic education. The integration of health and academic education could be in the form of health education being woven into one or more existing mainstream school subjects or of distinctive health education lessons that also included academic content.	The results suggest that school-based health curriculum interventions had a small but significant effect in reducing substance use for young children in school years 7-9 and 10-11.
Morton et al.	2011	HIC/LMIC	US and Jordan	RCTs and quasi-experimental studies with a prospectively assigned control group.	3	10-19 years old	Youth empowerment programs (YEPs) that regularly involve adolescents in determining program design, activities, and/or implementation. Structurally, this participation often takes the form of democratic decision-making processes involving, for example, youth councils, committees, youth on boards, workgroups, staff positions or other youth groups with regular opportunities for program decision-making. Included programs had to have convened regularly (i.e., not a one-off event).	Overall, this review reveals an insufficient evidence-base from experimental or quasi-experimental studies to substantiate the expectation that youth empowered programs (YEPs) have an impact on developmental assets such as self-efficacy and self-esteem. Further research into YEPs using rigorous impact study designs is needed.
Pakarinen et al.	2017	HIC	US, Singapore, and New Zealand	RCTs and quasi-experimental studies	5	≤ 18 years	The intervention had to be a video game (computer, console, mobile) intervention, which incorporated a component that aimed to enhance physical activity self-efficacy.	Four of the included studies found that game interventions, three which employed active games and one which employed an educational game, had positive effects on children's physical activity self-efficacy. The remaining included study, which employed a game-themed mobile application, showed no intervention effects. Overall, the study concludes that health game interventions seem to improve physical activity self-efficacy, however more research is needed before strong conclusions can be made.
Ulferts et al.	2019	HIC	9 European countries	Longitudinal designs	17	3-16 years old	Initiatives aimed at enhancing the quality of early childhood education and care with focus on two key aspects of process quality: global and domain-specific process quality.	Results from this review indicated small overall effect sizes for both global and domain-specific process quality and indicated lasting associations with academic development over children's school career.
Wilson et al. (a)	2006	HIC	USA, Canada, Australia, Italy	RCTs and non-RCTs	73	4-16 years	School-Based Universal Programs on social information processing interventions for aggressive behavior.	The research indicates that short, intensive interventions – e.g., 8-16 weeks of 2-5 hours a week – are more effective than extended year-long programs. Extended programs may have a tendency to become routine and thus have less impact on the students. Where the education programs target children in special education classes, the effect is lesser than in ordinary classes. Pupils in special classes may be prone to many other problems which could reduce the impact of this type of education.
Wilson et al. (b)	2006	HIC/LMIC	USA, Canada, Australia, Israel, Finland, India	RCTs and non-RCTs	47	4-16 years	School-Based Selected/ Indicated Pull-out Programs on social information processing interventions for aggressive behavior.	Subjects in the intervention group had significantly lower aggressive and disruptive behavior than comparison subjects.
Zeng et al.	2017	HIC	Australia, US, Switzerland, UK, Canada, and Finland.	RCTs	15	4-6 years old	Physical activity interventions (i.e., physical activity/exercise program or class).	The results of this review support the causal evidence of effects of physical activity on both motor skills and cognitive development in preschool children, however more research with strong methods is recommended to further confirm these findings.

SUPPLEMENTAL INFORMATION – HARRISON ET AL. *MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS*

Citation	Year	HIC/ LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Detail	Key Outcomes
Zief et al.	2006	HIC	USA	Experimental design studies	5	5-19 years	After-school programs that combine recreation and/or youth development programming with academic support services on promoting positive behaviors and reducing negative ones.	The programs themselves placed different emphases on promoting positive behaviors and reducing negative ones. However, it does not appear that any one approach was more or less effective at contributing towards improved behavioral outcomes or other estimated effects. The studies included in this review also provide no evidence that any one program model is more effective at changing students' context or improving academic outcomes.

Appendix G: AMSTAR 2 ratings of included studies with meta-analyses (n=78)

Citations	Final rating	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Bullying																	
Fraguas 2021	Critically low	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Gaffney 2019	Critically low	Yes	Yes	Yes	Partial Yes	No	No	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes
Gaffney 2021	Low	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Ttofi 2009	Critically low	Yes	No	Yes	Partial yes	No	No	No	No	No	No	Yes	No	No	Yes	No	Yes
Lee 2015	Critically low	Yes	No	No	Partial Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	Yes	No	No
Jiménez-Barbero 2016	Critically low	Yes	No	No	Partial Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No
Mytton 2006	Critically low	Yes	No	No	Partial Yes	Yes	Yes	Yes	Yes	Partial Yes	No	Yes	No	No	Yes	Yes	No
Substance Abuse																	
Boumparis 2019	critically low	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Carson 2011	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Espada 2015	Critically low	Yes	No	No	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	No	No
Faggiano 2008	critically low	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Faggiano 2014	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Gilligan 2019	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hefler 2017	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MacArthur 2018	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
O'Connor 2020	Critically low	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Thomas 2011	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Final rating	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Thomas 2013	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thomas 2015	Low	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Universal Prevention																	
Bennett 2015	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
Caldwell 2019	High	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Ciocanel 2017	Critically low	Yes	No	No	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Currier 2007	Critically low	Yes	No	No	Yes	No	No	No	Yes	No	No	Yes	No	No	No	No	No
Dray 2017	Low	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Dunning 2019	high	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Ekeland 2004	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Feiss 2019	Critically Low	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Franklin 2017	Critically low	Yes	No	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Hetrick 2016	High	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Langford 2015	Critically low	Yes	Partial yes	No	Partial yes	Yes	Yes	No	Yes	Partial yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Melendez-Torres 2016	Moderate	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Pratt 2010	Low	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Raposa 2019	Critically low	Yes	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Salazar de Pablo 2020	Low	Yes	Partial Yes	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Sanchez 2018	Low	Yes	No	yes	yes	yes	yes	No	No	No	No	yes	No	No	yes	yes	yes
Schleider 2017	Critically low	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes
Skeen 2019	Moderate	Yes	Yes	No	yes	yes	yes	Partial yes	yes	yes	No	Yes	yes	yes	No	No	yes

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Final rating	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Spruit 2016	Critically low	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	yes	No
Taylor 2017	critically low	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	yes	No
Tejada-Gallardo 2020	High	Yes	yes	No	Yes	Yes	Yes	Partial yes	yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Vallis 2020	Moderate	No	No	No	Yes	Yes	Yes	partial yes	No	Yes	No	Yes	Yes	Yes	Yes	yes	Yes
Van Genugten 2017	Low	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Watson 2017	Critically low	No	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes
Bee 2014	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Broning 2012	Critically low	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
Coren 2013	Low	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
Gillies 2016	High	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Mckenzie 2018	critically low	No	Partial yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes
Newton 2010	Low	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Peltonen 2010	Critically low	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
Pilling 2020	Low	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Responsive Caregiving/Safety and Security																	
Burkey 2018	High	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Leijten 2016	Moderate	Yes	yes	No	yes	yes	yes	No	yes	yes	No	yes	yes	yes	yes	No	yes
Macbeth 2015	Critically low	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Sanders 2014	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
Valentine 2019	High	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Vlahovicova 2017	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
Walsh 2015	High	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Final rating	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
McGinn 2020	High	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Bastounis 2016	Critically Low	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Dowdall 2019	Low	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Durlak 2007	Critically low	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No
Durlak 2011	Critically low	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No
Durlak 2010	Critically low	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No
Hodder 2017	Moderate	Yes	Yes	No	Yes	Yes	Yes	yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Jackson 2016	Critically low	Yes	No	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Klingbeil 2017	Low	Yes	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Liu 2015	Critically low	Yes	No	No	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Maynard 2017	High	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Melendez-Torres 2018	High	Yes	partial yes	No	Yes	Yes	Yes	Partial yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Morton 2011	High	Yes	partial yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Ulferts 2019	Low	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	Yes	Yes	No
Wilson 2006(a)	Critically Low	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Wilson 2006 (b)	Critically Low	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Zief 2006	Critically Low	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Kristjansson 2006	Low	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Self-harm																	
Morken 2019	Critically low	Yes	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Citations	Final rating	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Witt 2021	Critically low	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

AMSTAR 2 Question Guide:

Number	Question
Q1	Did the research questions and inclusion criteria for the review include the components of PICO?
Q2	Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?
Q3	Did the review authors explain their selection of the study designs for inclusion in the review?
Q4	Did the review authors use a comprehensive literature search strategy?
Q5	Did the review authors perform study selection in duplicate?
Q6	Did the review authors perform data extraction in duplicate?
Q7	Did the review authors provide a list of excluded studies and justify the exclusion?
Q8	Did the review authors describe the included studies in adequate detail?
Q9	Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?
Q10	Did the review authors report on the sources of funding for the studies included in the review?
Q11	If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?
Q12	If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?
Q13	Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?
Q14	Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?
Q15	If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?
Q16	Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

Appendix H: Summary of interventions delivered to special populations

Study Characteristics

Through our search, we captured a total of 29 reviews that analyzed prevention interventions containing special populations (e.g., children with chronic illness, residing in conflict settings, etc.). Seven reviews exclusively included RCTs and the remaining reviews included any of the following study designs: cross-sectional, cohort, case-control, before-and-after, cluster RCT, quasi- and non-randomized trials, reviews, descriptive, qualitative, and mixed methods studies. Eleven reviews evaluated programs conducted in both HIC and LMIC, 9 were in HIC, 2 were in LMIC, and 7 did not report the location. The age range of participants included infants less than 1 year old to young adults aged 24 years old. The earliest systematic review was published in 2006 and the latest in 2021.

Intervention Details

The interventions containing special populations were all preventive and focused on bullying, substance abuse, self-harm, responsive caregiving, safety and security, early learning and positive development, or universal programs. The interventions took place at the family, school, and community levels. Some examples of interventions include but are not limited to stigma-based campaigns, anti-bullying, violence prevention, peer victimization, parenting guidance, occupation and activity based, psychological or psychosocial or pharmacological therapies, psychoeducational, CBT, direct cash payments, family-group decision making, school feeding programs, or physical activity programs. Interventions were aimed at preventing aggressive behaviours, substance abuse, anxiety, trauma, depression, suicide, PTSD, and improving PYD, emotions, coping skills, social-emotional learning, and quality of life.

Intervention Effects

School-Based Interventions

Two studies meta-analyzed school-based preventive interventions for special populations. **Kristjansson 2006** assessed school feeding programs in HIC and LMIC for children 5-19 years old who were classified as disadvantaged economically. The review concludes that school meals may provide some small benefits for disadvantaged children, however more rigorous research is needed to make recommendations. **Mytton 2006** assessed violence prevention programmes in HIC for children aged 4-16 years old identified as aggressive or at risk of being aggressive. The review concludes that these types of interventions appear to produce improvements in behaviour greater than what would be expected by chance, up to 12 months.

Community-Based Interventions

Bee 2014 assessed community-based non-residential psychological or psychosocial interventions in HIC involving children aged ≤ 18 years old who had a parent with severe mental health illness or depression. The review found that evidence for enhanced quality of life for the child was lacking due primarily to the poor quality of studies included.

School and Community-Based Interventions

Three studies meta-analyzed prevention interventions at the school and community levels, where only 1 found positive effects on mental health outcomes. **McKenzie 2018** assessed well-being interventions in HIC involving 0–15-year-old siblings of children and young people with chronic illness. The review suggests that well-being interventions have a positive effect on the psychological functioning of siblings of children and young people with a chronic illness, however more specificity on the interventions is needed.

Family-Based Interventions

Witt 2021 assessed psychosocial interventions, pharmacological agents, or natural products for preventing self-harm in HIC for children and adolescents aged up to 18 years old who engage in self-harm. However, only a small number of trials were identified and of poor quality, thus the evidence for these interventions was uncertain.

Family and Community-Based Interventions

Four studies meta-analyzed prevention interventions that were family or community-based but only 1 found positive effects with certainty on mental health outcomes. **Morken 2019** examined psychological, pharmaceutical, psychosocial, physical activity, or nutrition interventions aimed at preventing self-harm and suicide in children and adolescents aged 0-18 years old. Interventions directed at general populations were addressed in the main text. Interventions directed at youth who are at-risk or who have already developed problems involving self-harm and/or suicide will be addressed here. Dialectical behavioural therapy and developmental group therapy were found to be equally as effective on the repetition of self-harm as enhanced treatment as usual. However, the evidence was of low certainty and effects were found in the adolescent age group (12-18 years).

School, Community and Family-Based Interventions

Four studies meta-analyzed prevention interventions at the school, community, or family level. **Broning 2012** assessed preventive interventions on children and adolescents 0-17 years old with substance abusing parents. **Gillies 2016** assessed psychological or pharmacological therapies in HIC and LMIC for children and adolescents 0-18 years old who had undergone a traumatic event. **Newton 2010** assessed preventive interventions for pediatric patients 12-18 years old with suicide-related emergency department visits. **Pilling 2020** assessed psychological interventions in HIC for children or adolescents 4-18 years old with or at risk of developing a mental health disorder. In all 4 studies, high heterogeneity, moderate to high risk of bias, limited number of studies found, and overall poor quality led to inconclusive results and more research needed to derive strong recommendations.

Recommendations

There is sparse data on special population groups regardless of intervention type or delivery platform, and what studies have been conducted were overwhelmingly of poor quality. Due to the heterogeneity of interventions, outcomes, and special population groups, more research is needed before policy recommendations can be made.

Table H1. Special Populations Study Characteristics, by Domain

First Author	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Bullying Domain								
Earnshaw et al.	2018	HIC/LMIC	UK, USA, Zimbabwe, Australia, Canada	RCT	22	13-18 years	Intervention in schools that are stigma-based bullying interventions, targets children with disabilities	We found that stigma-based bullying interventions are becoming more numerous, yet are unevenly distributed across stigmas, geographic locations, and types of organizations. We further found that these interventions vary in the extent to which they incorporate theory and have been evaluated with a wide range of research designs and types of data. We recommend that future work address stigma-based bullying within multicomponent interventions, adopt interdisciplinary and theory-based approaches, and include rigorous and systematic evaluations.
Houchins et al.	2016	-	-	RCT, non-RCT	6	4-18 years	Intervention in schools that are anti-bullying interventions, targets children with disabilities	Results of our systematic literature substantiate that there is a considerable dearth of methodologically rigorous experimental and quasi-experimental studies.
Mytton et al.	2006	HIC	USA	RCT	32	4-16 years	Interventions that examine the effect of school-based violence prevention programmes for children identified as aggressive or at risk of being aggressive.	School-based secondary prevention programmes to reduce aggressive behaviour (like bullying or fighting), appear to produce improvements in behaviour greater than would have been expected by chance. Benefits can be achieved in both primary and secondary school age groups and in both mixed sex groups and boys-only groups. Further research is required to establish whether such programmes reduce the incidence of violent injuries or if the benefits identified can be maintained beyond 12 months.
Sentenac et al.	2011	HIC	UK, USA, Canada, Nordic Countries, South Africa, China	RCT	59	5-17 years	Interventions that reduce peer victimization at school among children or adolescents with a disability or chronic illness	The findings of our review suggest that, because of evidence of higher levels of peer victimization among students with chronic conditions, there is a growing need to implement specific interventions targeted at improving shared knowledge, acceptance, and positive interactions between children with chronic conditions and their peers to lower the level of victimization toward disabled children and those with chronic conditions. Whole antibullying programs should be developed, including a specific component on chronic conditions such as structured contacts with children with chronic conditions, and should be evaluated.
Substance Abuse Domain								
Garcia-Huidobro et al.	2018	HIC/LMIC	-	RCTs	38	10-19 years old	Universal parenting-based prevention programs that focused on reducing youth substance abuse.	Overall, interventions including male and female youth and youth in early adolescence (age 10 to 14 or in 5 th to 8 th grade) were more beneficial than interventions including female-only or both young and older adolescents. Programs tailored to specific racial/ethnic groups, as well as programs designed for youth from multiple races/ethnic groups were effective. Current evidence supports the benefits of offering parenting guidance to all families with adolescent children, regardless of the gender, age, or race/ethnicity of the adolescent.
Universal Domain								

First Author	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Antonio et al.	2015	HIC	USA, New Zealand, Australia, Canada	RCT, Quasi-experimental, before-and-after study, mixed method study	8	10-19 years old	1) examine an observed variable related to mental health and/or substance use; 2) have an intervention targeting Indigenous, Native, or Aboriginal youth	Most programs reported positive or expected outcomes. All the programs incorporated PYD variables, while all but one was culturally grounded or included deep structure adaptations. Outcomes assessed: positive youth development, mental health, emotion, anxiety or trauma, depression or suicide, stress, and cope or coping.
Arbesman et al.	2013	HIC/LMIC	-	Systematic reviews, RCTs, and non-randomized studies	124	3-21 years old	Occupation- and activity-based interventions (embedded in activities and within the domain of occupational therapy, although it did not have to be a common occupational therapy intervention or administered by an occupational therapist or occupational therapy assistant).	At the universal level, strong evidence exists for the effectiveness of occupation- and activity-based interventions in many areas, including schoolwide bullying prevention; and after-school, performing arts, and stress management activities. At the targeted level, strong evidence indicates that social and life skills programs are effective for children who are aggressive, have been rejected, and are teenage mothers. The evidence also is strong that children with intellectual impairments, developmental delays, and learning disabilities benefit from social skills programming and play, leisure, and recreational activities. Additionally, evidence of the effectiveness of social skills programs is strong for children requiring services at the intensive level (e.g., those with autism spectrum disorder, diagnosed mental illness, serious behavior disorders) to improve social behavior and self-management.
Barry et al.	2013	LMIC	India, Chile, South Africa, Mauritius, Uganda, Nepal, Palestine, Lebanon, Honduras, Egypt	RCT, quasi-experimental, cluster RCT	22	6-18 years old	Studies were eligible for inclusion if the intervention was designed to promote positive mental health for young people in LMIC settings.	The findings from the majority of the school-based interventions are strong. Structured universal interventions for children living in conflict areas indicate generally significant positive effects on students' emotional and behavioural wellbeing, including improved self-esteem and coping skills.
Bee et al.	2014	HIC	USA, UK, Canada, Australia	RCT, quasi-RCT	57	0-18 years old	Inclusion criteria required ≥ 50% of parents to have serious mental health illness or severe depression confirmed by clinical diagnosis or baseline symptoms. Community-based interventions included any non-residential psychological/psychosocial parts.	Evidence for community-based interventions to enhance QoL in children of SMI parents is lacking. The capacity to recommend evidence-based approaches is limited. Rigorous development work is needed to establish feasible and acceptable child- and family-based interventions, prior to evaluating clinical effectiveness and cost-effectiveness via a randomised controlled trial (RCT). A substantial programme of pilot work is recommended to underpin the development of feasible and acceptable interventions for this population. Key outcome were health and well-being.
Bröning et al.	2012	-	-	RCTs, controlled clinical trials, quasi-RCT, descriptive, and qualitative	13	0-17 years old	Preventive interventions on children and adolescents with substance abusing parents (or on affected families as a whole entity).	There was preliminary evidence for the effectiveness of the programs, especially when their duration was longer than ten weeks and when they involved children's, parenting, and family skills training components.

First Author	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Coren et al.	2013	HIC	USA, UK, and Korea	RCT, controlled before-and-after studies, quasi-experimental studies	11	0-24 years old	Studies were included if they evaluated interventions aimed to benefit street-connected children and young people by promoting inclusion and reintegration; increase literacy and numeracy; increase access to education and employment; promote mental health, including self-esteem; and/or reduce harms associated with early sexual activity and substance misuse.	Analysis across the included studies found no consistently significant benefit for the 'new' interventions compared to standard services for street-connected children and young people. These latter interventions, however, have not been rigorously evaluated, especially in the context of LMICs.
Everson-Hock et al.	2012	HIC	USA, UK	RCTs, non-RCTs, case-control studies, prospective cohort studies, retrospective, and non-comparative study designs	6	0-18 years old	Intervention with additional training and support provided to approved carers, professionals and volunteers on the physical and emotional health and well-being of LACYP (including problem behaviours and placement stability).	The evidence identified appears to suggest that longer-duration training programmes have a beneficial effect on the behaviour problems of LACYP. Included studies only included additional training for foster care workers.
Gillies et al.	2016	HIC/LMIC	DRC, USA, Sri Lanka, Peru, Bosnia, Canada, Burundi, Sierra Leone, Jordan, Indonesia, Iran, Switzerland, Palestine	RCT, quasi-randomization, Cluster RCT	88	0-18 years old	Psychological therapies compared with a control such as treatment as usual, waiting list or no treatment, pharmacological therapy or other treatments in children or adolescents who had undergone a traumatic event.	The meta-analyses in this review provide some evidence for the effectiveness of psychological therapies in prevention of PTSD and reduction of symptoms in children and adolescents exposed to trauma for up to a month.
Jones et al.	2018	HIC/LMIC	USA, Finland, Sweden, Canada, Burundi, New Zealand	RCT, efficacy trial, quasi-RCT	15	12-18 years old	Studies of psychoeducational interventions (PIs) targeting depression as part of prevention or management approaches in the adolescent age group; targeted programmes for individuals with depression/depressive symptoms.	PIs can have a role in preventing/managing adolescent depression, as a first-line or adjunctive approach. The limited number of studies, heterogeneity in formats and evaluation, and inconsistent approach to defining PI, make it difficult to compare programmes and measure overall effectiveness.
Jordans et al.	2016	LMIC	Uganda, Palestine, Sudan, Nepal, Burundi, Sri Lanka, Bosnia, DRC	All study designs	24	0-18 years old	Interventions describe, and evaluate the effect of, psychosocial and mental health interventions for children affected by armed conflict in LMIC.	Overall, interventions appeared to show promising results demonstrating mostly moderate effect sizes on mental health and psychosocial well-being.
McKenzie et al.	2018	HIC	Germany, UK, The Republic of Ireland, Australia, Canada, the Netherlands, and Sweden	Mixed methods	8	0-15 years old	Studies were included if they evaluated a well-being intervention offered to siblings of children and young people with a chronic physical or mental health condition.	In conclusion, the findings suggest interventions for well-being have a positive effect on the psychological functioning of siblings of children and young people with a chronic illness, but their specificity needs to be established.

SUPPLEMENTAL INFORMATION – HARRISON ET AL. *MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS*

First Author	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Newton et al.	2010	-	-	Experimental, quasi-experimental	10	12-18 years old	Interventions for pediatric patients with suicide-related emergency department (ED) visits.	Transition interventions appear most promising for reducing suicide-related outcomes and improving post-ED treatment adherence.
Peltonen et al.	2010	-	-	All study designs	19	0-18 years old	Eligible studies for the review reported interventions among children in conditions of war, military violence, terrorism and living as refugees. The primary foci are child and adolescent mental health, and psychological, social or behavioral development and functioning.	A majority of the reported preventive interventions focused only on children's biased cognitive processes and negative emotions, while only a few aimed at influencing multiple domains of child development and improving developmental functioning on emotional, social and psychophysiological levels. It is concluded that substantial additional work needs to be done in developing effective preventive interventions and treatments for children traumatized by exposure to war and violence.
Pilling et al.	2020	HIC	Iceland, Canada USA, Australia, Norway, UK, Spain, Sweden, Netherlands, Finland, Israel, Germany, New Zealand	RCTs	138	4-18 years	Psychological interventions for children or young people between 4 and 18 years old with or at risk of developing a mental health disorder; Group CBT, Multiple interventions, Family intervention, Individual cognitive and behavioral treatments, Parenting, Other—motivational interviewing.	Psychosocial interventions provided in a range of settings by professionals and paraprofessionals can deliver lasting benefits. High levels of heterogeneity, moderate to high risk of bias for most studies and evidence of publication bias require caution in interpreting the results. Lack of studies in diagnostic groups such as ADHD and self-harm limit the conclusions that can be drawn. Programs that increase such interventions' availability are justified by the benefits to children and young people and the decreased likelihood of disorder in adulthood.
Zlotnick et al.	2012	-	-	Cross-sectional, cohort, prospective	43	0-18 years old	Intervention for homeless or foster care children and their families.	Virtually all studies on both homeless and foster children devised interventions to reduce trauma and family instability; yet no evidence-based practice addresses the overlapping needs and potentially relevant evidence-based practice for these two populations.
Responsive Caregiving Domain								
Morrison et al.	2014	HIC	UK, Sweden, Ireland	RCTs, quasi-experiments with control group, mixed methods and qualitative evaluations	23	Day care and preschool children	Parenting interventions in European countries aiming to reduce social inequalities in children's health and development.	Interventions with better outcomes and a higher level of evidence combined workshops and educational programs for both parents and children beginning during early pregnancy and included home visits by specialized staff.
Safety and Security Domain								
Lucas et al.	2008	HIC	US and Canada	RCTs and Quasi experimental studies	9	<18 years old	Interventions to increase the amount of money available to a family. These include direct cash payments and positive taxation schemes, such as Negative Income Tax, which benefit low-income families.	No effect was observed on child health, measures of child mental health or emotional state. Non-significant effects favouring the intervention group were seen for child cognitive development and educational achievement, and a non-significant effect favouring controls in rates of teenage pregnancy.

First Author	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Macdonald et al.	2012	HIC	US and Australia	RCTs	10	≤ 18 years old	Behavioural or cognitive-behavioural or that described the use of cognitive-behavioural interventions. Interventions might or might not have included parents but had to have included children as recipients of therapy.	Overall, the reporting of studies was poor, and there appear to be significant weaknesses in study quality. The evidence suggests that CBT may have a positive impact on the effects of child sexual abuse, including depression, post-traumatic stress and anxiety, but the results were generally modest.
McGinn et al.	2020	HIC	US, Canada, Sweden, and the Netherlands	RCTs and quasi-experimental designs	15	0-18 years old	Any form of Family Group Decision-Making (FGDM) interventions used in the course of a child maltreatment investigation or during the course of services arising from such an investigation. FGDM involves convening family and child protection professionals with one or more of other professionals, extended family, identified friends and/or community members. In an effort to collaboratively develop a plan to maintain child safety, facilitate stable and permanent living arrangements, and promote child well-being.	Overall, the evidence from this review is insufficient to draw conclusions about the effectiveness of FGDM. These models of child protection decision-making may help bring about better outcomes for children at risk, or they may increase the risk of further maltreatment. Further research of rigour, designed to avoid the potential biases of previous evaluations, is needed.
Winokur et al.	2014	HIC	USA, Spain, Norway, Australia, Ireland, UK, Israel, Sweden, Netherlands	Quasi-experimental studies	102	< 18 years old	Children removed from the home for maltreatment and subsequently placed in kinship foster care were compared with children placed in non-kinship foster care for child welfare outcomes in the domains of well-being, permanency, or safety.	This review supports the practice of treating kinship care as a viable out-of-home placement option for children removed from the home for maltreatment. However, this conclusion is tempered by the pronounced methodological and design weaknesses of the included studies.
Early Learning and Positive Development Domain								
Bendixen et al.	2011	-	-	RCT, quasi-experimental, cluster RCT, before-after	46	-	Efficacy studies that investigate aspects of OT interventions.	The majority of reviewed published research investigated variables representing constructs falling within the ICF domains of Body Functioning and Activity. The effect of OT interventions on PYD resided primarily in building competence. In order to meet the tenets of the CV, OTs must document changes in children's engagement.
Kristjansson et al.	2006	HIC/LMIC	India, Wales, USA, Jamaica, England, China, Peru, Kenya, Scotland, UK, and Canada	RCTs, controlled before and after studies, interrupted time series	18	5-19 years old	School feeding programs (meals (breakfast or lunch) or snacks (including milk) administered in a school setting)	School meals may have some small benefits for disadvantaged children. We recommend further well-designed studies on the effectiveness of school meals be undertaken, that results should be reported according to socio-economic status, and that researchers gather robust data on both processes and carefully chosen outcomes.
Self-Harm Domain								

SUPPLEMENTAL INFORMATION – HARRISON ET AL. *MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS*

First Author	Year	HIC/LMIC	Countries	Designs Included	Number of Studies	Age Range	Intervention Assessed	Key Outcomes
Morken et al.	2019	-	-	Systematic reviews	8	0-18 years	Any intervention aimed at preventing or reducing self-harm and suicide, including psychological therapy, pharmaceutical interventions, psychosocial interventions, physical activity, or nutrition.	Moderate certainty evidence suggests that school-based interventions prevent suicidal ideation and attempts short term, and possibly suicide attempts long term. The effects of community-based interventions following suicide clusters and local suicide plans are unknown, as are the benefits and harms of screening young people for suicide risk.
Witt et al.	2021	HIC	UK, USA, Canada, Norway, Spain, Australia, New Zealand	RCTs	17	10-19 years	Psychosocial interventions or pharmacological agents or natural products for self-harm (SH) compared to comparison types of care (e.g., treatment-as-usual, routine psychiatric care, enhanced usual care, active comparator, placebo, alternative pharmacological treatment, or a combination of these) for children and adolescents (up to 18 years of age) who engage in SH.	Given the moderate or very low quality of the available evidence, and the small number of trials identified, there is only uncertain evidence regarding a number of psychosocial interventions in children and adolescents who engage in SH. Further evaluation of DBT-A is warranted. Given the evidence for its benefit in adults who engage in SH, individual CBT-based psychotherapy should also be further developed and evaluated in children and adolescents.

Table H2. Special Populations Meta-Analysis Results, by Delivery Platform

Citations	Comparison	Outcomes	Pooled Effect Estimates [95% CI]	AMSTAR rating	Total # of people	Total # of studies
School-Based Interventions						
Kristjansson 2006	"No-treatment" controls or placebo controls	Math change overall icc .15: School meal, Developing country, CBA	SMD= 0.31 [0.09, 0.53]	Low	177; 160	2
		Math change by nutritional status, icc 0.15: School meal, Developing country, CBA	SMD= 0.44 [0.22, 0.67]		177; 160	2
		Math change overall icc .1: School meal, Developing country, CBA	SMD= 0.27 [0.03, 0.51]		177; 160	2
		Math change overall icc .2: School meal, Developing country, CBA	SMD= 0.27 [-0.03, 0.56]		177; 160	2
Mytton 2006	Any violence prevention intervention vs no intervention	Difference in aggression scale score or observed aggression by type of school (post-test)	SMD= -0.41 [-0.56, -0.26]	Critically low	2939	34
	Anger/conflict response interventions (skills of non-response to provocative situations, e.g., conflict resolution, anger control) vs no intervention	Difference in aggression scale score or observed aggression by type of school (post-test)	SMD= -0.39 [-0.61, -0.16]		943	18
	Social skills & context interventions vs no intervention	Difference in aggression scale score or observed aggression by type of school (post-test)	SMD= -0.61 [-0.87, -0.35]		479	7
	Combined anger response & social skills interventions vs no intervention	Difference in aggression scale score or observed aggression by type of school (post-test)	SMD= -0.28[-0.55, -0.01]		564	7
Community-Based Interventions						
Bee 2014	Treatment as usual/waiting list control	Children's short-term emotional well-being	SMD= 0.06 [-0.20, 0.33]	High		6
		Children's behaviour and social function	SMD= 0.23 [0.00, 0.46]			10
School & Community-Based Interventions						
Coren 2013	-	Number of times had sex - 6 months	MD= 0.73 [-2.97, 4.43]	Low	242	2
		Number of sexual partners - 6 months	MD= -0.04 [-0.22, 0.13]		242	2
		Number of days used alcohol in last month - 3 months	MD= 1.1[-0.67, 2.88]		235	2
		Number of categories of drug use (Form 90) - 6 months	MD= 0.14 [-0.33, 0.61]		261	2
		Number of days used marijuana in last month – 3 months	MD= 0.37 [-2.37, 3.47]		235	2
		Self-esteem at endpoint	MD= 0.11 [-0.22, 0.44]		142	2
		Depression at 6 months	MD= -0.43 [-2.83, 1.98]		261	2
		Family violence (Conflict Tactic Scale) - 3 months	MD= -4.28 [-0.02, 0.02]		208	3
		Percentage of days living at home (Form 90) - 3 months	MD= -9.46 [-27.96, 9.03]		75	2
		Delinquent behaviours at 12 months	MD= -0.16 [-1.05, 0.72]		177	2
		Internalising behaviours at 6 months	MD= -1.14 [-3.36, 1.09]		261	2
		Externalizing behaviours at 6 months	MD= 0.41 [-3.27, 4.10]		261	2

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Comparison	Outcomes	Pooled Effect Estimates [95% CI]	AMSTAR rating	Total # of people	Total # of studies
		Family conflict	MD= -0.05 [-0.91, 0.81]		208	3
Mckenzie 2018	-	Behaviour Results- Total	SMD= -0.04 [-0.18, 0.09]	Critically low		4
		Behaviour Results- Internalizing	SMD= -0.11 [-0.25, 0.02]			4
		Behaviour Results- Externalizing	SMD= 0.04 [-0.10, 0.17]			4
		Knowledge outcomes	SMD= 0.68 [0.40, 0.95]			5
Lucas 2008	No intervention	Children not covered by health insurance	OR= 1.05 [0.90, 1.23]	High	5078	3
		Accidental injuries	OR= 1.02 [0.86, 1.21]		4854	3
		Positive behaviour	OR= 0.96 [0.79, 1.17]		4536	4
		Behaviour problems	OR= 1.09 [0.98, 1.22]		8895	5
		Below average achievement	OR= 1.00 [0.90, 1.11]		14023	6
		Ever repeated a grade (compared to educational outcomes)	OR= 1.00 [0.88, 1.13]		12077	6
		Ever suspended or expelled	OR= 1.09 [0.94, 1.27]		7050	5
		Ever pregnant or had a baby	OR= 1.12 [0.82, 1.52]		2028	3
		Academic achievement rated as poor	OR= 1.00 [0.90, 1.11]		14023	7
		Ever repeated a grade (compared to value of intervention)	OR= 1.00 [0.89, 1.14]		12077	7
Family-Based Interventions						
Witt 2021	CBT-based psychotherapy_ compared to alternative psychotherapy	Repetition of SH: post-intervention	OR= 0.93 [0.12, 7.24]	Critically low	51	2
		Depression scores difference at post-intervention and 12 months follow up	MD= -3.56 [10.71, 3.59]		-	
	Dialectical behavior therapy (DBT) versus TAU or another comparator	Repetition of SH	OR= 0.46 [0.26, 0.82]		270	4
		Depression scores post intervention	SMD= -0.42 [-0.81, -0.03]		103	2
		Hopelessness	SMD= -0.62 [-1.07, -0.16]		100	2
		Suicidal ideation	SMD= -0.43 [-0.68, -0.18]		256	4
	Mentalization-based therapy versus TAU or other comparator	Repetition of SH	OR= 0.70 [0.06, 8.46]		85	2
Family interventions versus TAU or other comparator	Repetition of SH	OR= 1.00 [0.49, 2.07]	191	2		
Family & Community-Based Interventions						
Peltonen 2010	-	Effect on PTSD	SMD= -0.56 [-1.04, -0.07]	Critically low	Exp:198 Cont: 186	4
Macdonald 2012	Treatment as usual or wait list controls.	Child depression, short term (immediately after treatment)	MD= -1.92 [-4.24, 0.40]		421	5
		Child depression, intermediate term (3-6 months after treatment)	MD= -1.84 [-3.41, -0.27]		286	4
		Child depression, long term (at least one year)	MD= -1.19 [-2.70, 0.32]		301	4
		Child post-traumatic stress disorder, short term (immediately after treatment)	SMD= -0.44 [-0.73, -0.16]		442	6

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Comparison	Outcomes	Pooled Effect Estimates [95% CI]	AMSTAR rating	Total # of people	Total # of studies
		Child post-traumatic stress disorder, intermediate term (3-6 months after treatment)	SMD= -0.39 [-0.74, -0.04]	High	327	5
		Child post-traumatic stress disorder, long term (at least one year)	SMD= -0.38 [-0.65, -0.11]		246	3
		Child anxiety, short term (immediately after treatment)	SMD= -0.23 [-0.42, -0.03]		434	5
		Child anxiety, intermediate term (3-6 months after treatment)	SMD= -0.38 [-0.61, -0.14]		296	4
		Child anxiety, long term (at least one year)	SMD= -0.28 [-0.52, -0.04]		278	4
		Child sexualised behaviour, short term (immediately after treatment)	MD= -0.65 [-3.53, 2.24]		415	5
		Child sexualised behaviour, intermediate term (3-6 months after treatment)	MD= -0.46 [-5.68, 4.76]		133	3
		Child sexualised behaviour, long term (at least one year)	MD= -1.61 [-5.72, 2.49]		161	3
		Child externalizing behaviour, short term (immediately after treatment)	SMD= -0.12 [-0.40, 0.17]		537	7
		Child externalizing behaviour, intermediate term (3-6 months after treatment)	SMD= -0.11 [-0.42, 0.21]	175	4	
		Child externalizing behaviour, long term (at least one year)	SMD= 0.05 [-0.16, 0.27]	355	5	
		Parent's belief of child, short term (immediately after treatment)	SMD= 0.30 [0.03, 0.57]	211	2	
		Parenting skills, short term (immediately after treatment)	MD= 3.86 [0.47, 7.26]	278	3	
		Parenting skills, intermediate term (3-6 months after treatment)	MD= 2.36 [-1.55, 6.28]	231	3	
		Parenting skills, long term (at least one year)	MD= -0.89 [-4.89, 3.11]	193	2	
		Parent's emotional reaction, short term (immediately after treatment)	MD= -6.95 [-10.11, -3.80]	223	2	
		Parent's emotional reaction, intermediate term (3-6 months after treatment)	MD= -3.46 [-6.98, 0.06]	187	2	
		Morken 2019	Children and adolescents between the ages of 10 and 23: School-based suicide prevention programs vs TAU, alternative interventions, wait list or no intervention	Suicidal ideation	RR= 0.67 [0.48, 0.93]	Critically low
Suicide attempts (3- to 12-month follow-up)	RR= 0.53 [0.36, 0.80]			14042	5	
Adolescents, 12- to 19-year-olds, with a history of multiple episodes of self-harm: Dialectical behavior therapy for adolescents (DBT-A) Control: TAU or enhanced TAU	Repetition of self-harm – between 16 weeks and 6 month follow-up-period		OR= 0.72 [0.12, 4.40]	105	2	
	Frequency of self-harm – between 16 weeks and 6 month follow-up-period		MD= -0.79 [-2.78, 1.20]	104	2	
	Suicidal ideation – between 16 week and 12 month follow-up-period		SMD= -0.62 [-1.07, -0.16]	100	2	
Adolescents, 12- to 17-year-olds, referred to child and adolescent services following an episode of intentional self-	Repetition of self-harm – 6-month follow-up period		OR= 1.72 [0.56, 5.24]	430	2	
	Repetition of self-harm – 12-month follow-up period		OR= 0.80 [0.22, 2.97]	490	3	

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Comparison	Outcomes	Pooled Effect Estimates [95% CI]	AMSTAR rating	Total # of people	Total # of studies
	injury or self-poisoning, irrespective of intent: Developmental group therapy vs TAU	Depression (scale not reported) –12-month follow-up period	MD= -0.93 [-4.03, 2.17]		473	3
		Suicidal ideation (scale not reported) – 12- month follow-up period	MD= -1.51 [-9.62, 6.59]		471	3
Winokur 2014	Children placed in kinship foster care were compared with children placed in non-kinship foster care	Behavioral problems-continuous	SMD= -0.33 [-0.49, -0.17]	High	2815	15
		Behavioral problems dichotomous	SMD= 0.62 [0.41, 0.93]		16449	6
		Adaptive behaviors	SMD= -0.42 [-0.61, -0.22]		1287	6
		Psychiatric disorders-dichotomous	OR= 0.51 [0.42, 0.62]		50751	6
		Well-being-dichotomous	OR= 0.50 [0.38, 0.64]		318009	4
		Placement disruption	OR= 0.52 [0.40, 0.69]		6881	5
		Likely to utilize mental health services	OR= 1.79 [1.35, 2.37]		152626	13
		Likely to utilize developmental services	OR= 0.94 [0.38, 2.32]		48058	3
		Likely to utilize physician services	OR= 1.37 [0.48, 3.93]		214005	7
		Institutional abuse	OR= 0.27 [0.10, 0.71]		1202	3
		Likely to be adopted	OR= 2.52 [1.42, 4.49]		66817	12
		Likely to be given guardianship	OR= 0.26 [0.17, 0.40]		64733	8
		Repeated a grade in school	OR= 0.73 [0.50, 1.07]		1219	6
		Family attachment continuous	OR= -0.01 [-0.30, 0.28]		499	5
Family attachment dichotomous	OR= 1.21 [0.56, 2.59]	375	4			
School, Community & Family-Based Interventions						
Bröning 2012	-	Prevention of substance abuse SMAAP: knowledge, coping, social behaviour	r = 0.54, 0.24, 0.12	Critically low	>200	
		Prevention of substance abuse SBSG: knowledge, coping	r = 0.37, 0.54		100-200	
		Prevention of substance abuse CHOICES: self-esteem, school performance	r = 0.43, 0.52		<50	
		Prevention of substance abuse FOF: family functioning	r = 0.22		100-200	
		Prevention of substance abuse FOF: lower SUD risk (m), delayed age of onset (m) at FU	OR = 0.80, r = 0.39		100-200	
		Prevention of substance abuse SFP: social behaviour	r = 0.11		>200	
		Prevention of substance abuse FCP: knowledge, social behavior, family functioning	r = 0.70, 0.44, 0.44		<50	
		Prevention of substance abuse SHP: externalizing symptoms, internalizing symptoms, family functioning	r = 0.34, 0.29, 0.29		100-200	
Gillies 2016	-	PTSD Diagnosis risk with all psychotherapies	OR= 0.51 [0.34, 0.77]	High	87	5
		PTSD Diagnosis Risk with CBT	OR= 0.74 [0.29, 1.91]		160	2
Newton 2010	-	ED- Based intervention	MD = 2.6 [0.05, 5.15]			-

SUPPLEMENTAL INFORMATION – HARRISON ET AL. MENTAL HEALTH AND POSITIVE DEVELOPMENT INTERVENTIONS

Citations	Comparison	Outcomes	Pooled Effect Estimates [95% CI]	AMSTAR rating	Total # of people	Total # of studies
		ED + Post-ED intervention	RR = 0.10 [0.03, 0.41]	Low		-
		Post-ED intervention	RR = 2.13 [0.53, 9.08]			-
Pilling 2020	-	Overall effect size (ES) post-intervention	g= 0.39 [0.30, 0.47]	Low	13,982	115
		At 12 months follow-up	g= 0.31 [0.25, 0.37]		25,652	165
		Depression	g= 0.21 [0.10, 0.32]			-
		Anxiety disorders	g= 0.51 [0.34, 0.68]			-
		Conduct disorders	g= 0.23 [0.14, 0.33]			44
		Effect size (ES) post intervention	g= 0.19 [0.01, 0.38]			14
		Effect size (ES) post follow up	g= 0.26 [0.15, 0.36]			27
		Family-based interventions	g= 0.53 [0.06, 1.00]			6
		Interventions for anxiety disorders hold up well from end of treatment	g= 0.61 [0.34, 0.89]			36
		Follow-up	g= 0.51 [0.34, 0.68]			43
		depressive disorders ESs post intervention	g= 0.38 [0.24, 0.53]			28
		Follow-up	g= 0.21 [0.10, 0.32]			30

Table H3. Key Effects of Interventions on Depression, Anxiety, and Externalizing symptoms/behaviors in Special Populations

Delivery platform	Depression	Anxiety	Externalizing symptoms/behaviors
School-Based	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Any violence prevention intervention*⁸¹ <ul style="list-style-type: none"> ○ SMD= -0.41 [-0.56, -0.26] • Anger/conflict response intervention*⁸¹ <ul style="list-style-type: none"> ○ SMD= -0.39 [-0.61, -0.16] • Social skills and context intervention*⁸¹ <ul style="list-style-type: none"> ○ SMD= -0.61 [-0.87, -0.35] • Combined anger response and social skills intervention*⁸¹ <ul style="list-style-type: none"> ○ SMD= -0.28 [-0.55, -0.01]
Community-Based	<ul style="list-style-type: none"> • Developmental group therapy^{§63} <ul style="list-style-type: none"> ○ MD= -0.93 [-4.03, 2.17] ¶ • CBT-based psychotherapy*⁶⁴ <ul style="list-style-type: none"> ○ MD= -3.56 [10.71, 3.59] ¶ • Dialectical behavior therapy*⁶⁴ <ul style="list-style-type: none"> ○ MD= -0.42 [-0.81, -0.03] ¶ • Cognitive-behavioural interventions*⁵⁹ <ul style="list-style-type: none"> ○ Short term (immediately post-treatment) MD= -1.92 [-4.24, 0.40] ○ Intermediate term (3-6 months) MD= -1.84 [-3.41, -0.27] 	<ul style="list-style-type: none"> • Cognitive-behavioural interventions*⁵⁹ <ul style="list-style-type: none"> ○ Short term (immediately post-treatment) SMD= -0.38 [-0.61, -0.14] ○ Intermediate term (3-6 months) SMD= -0.28 [-0.52, -0.04] ○ Long term (at least 1 year) SMD= -0.23 [-0.42, -0.03] 	<ul style="list-style-type: none"> • Cognitive-behavioural interventions*⁵⁹ <ul style="list-style-type: none"> ○ Short term (immediately post-treatment) SMD= -0.12 [-0.40, 0.17] ○ Intermediate term (3-6 months) SMD= -0.11 [-0.42, 0.21] ○ Long term (at least 1 year) SMD= 0.05 [-0.16, 0.27]

Delivery platform	Depression	Anxiety	Externalizing symptoms/behaviors
	<ul style="list-style-type: none"> ○ Long term (at least 1 year) MD= -1.19 [-2.70, 0.32] ● Psychoeducational interventions‡¹⁷⁰ <ul style="list-style-type: none"> ○ Unable to compare programs and measure overall effectiveness (n=15) 		
Mixed Settings	<ul style="list-style-type: none"> ● Structured universal interventions†¹⁰⁸ <ul style="list-style-type: none"> ○ ↓ reduction in depressive symptoms (n=8) ● Interventions that promote inclusion and reintegration*¹⁶⁷ <ul style="list-style-type: none"> ○ MD= -0.43 [-2.83, 1.98] 	<ul style="list-style-type: none"> ● NA 	<ul style="list-style-type: none"> ● Interventions that promote inclusion and reintegration*¹⁶⁷ <ul style="list-style-type: none"> ○ MD= 0.41 [-3.27, 4.10] ● Well-being interventions*¹⁷² <ul style="list-style-type: none"> ○ SMD= 0.04 [-0.10, 0.17]

*= HIC context; †=LMIC; ‡= HIC and LMIC; §=country context not reported; ¶= significance not reported

Note: bolded effect= significant; italicized effect=non-significant.

Appendix I: PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5, appendix
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	6, appendix
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	6, appendix
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6, appendix
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	6, appendix
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	6, appendix
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6, appendix
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	6, appendix
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N/A

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N/A
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	6
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	7
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	7
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	7
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	12
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	13
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	14
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. doi:10.1371/journal.pmed1000097

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