

Evidence Synthesis of Impact of Mental Health Promotion

A systematic rapid evidence assessment of the effectiveness of mental health promotion interventions across the lifecourse

February, 2022

**Dr Tuuli Kuosmanen, Ms Tosca Keppler, Dr Katherine Dowling &
Professor Margaret Barry**

**Health Promotion Research Centre
National University of Ireland Galway**

Acknowledgments

This evidence synthesis was commissioned by the Department of Health, Ireland.

The views expressed in this report are those of the authors only.

Suggested citation: Kuosmanen, T., Keppler, T., Dowling, K., Barry, M. M. (2022). *Evidence Synthesis of Impact of Mental Health Promotion: A systematic rapid evidence assessment of the effectiveness of mental health promotion interventions across the lifecourse*. Health Promotion Research Centre, National University of Ireland Galway.



www.nuigalway.ie/hprc/

Table of Contents

Executive Summary.....	5
INTRODUCTION	13
Background	13
Mental health promotion and primary prevention	15
Irish policy context	17
Review Aim	18
METHODOLOGY	19
Study design.....	19
Search strategy	19
Eligibility criteria	20
Study selection.....	20
Data extraction and synthesis.....	21
Quality assessment	21
RESULTS.....	22
Selection of studies	22
Early years and parenting interventions.....	23
Perinatal interventions for maternal mental health	24
School-based interventions	27
Community-based interventions for young people	32
Universal and targeted psychological interventions	33
Mindfulness-based interventions	34
Physical activity interventions	34
Other intervention approaches	34
Community-based interventions for adults.....	36
Individual level interventions.....	37
Social and environmental level interventions	38
Reviews not fully meeting the inclusion criteria	38
Community-based interventions for older adults	39
Mindfulness and mind-body interventions	40
Programmed exercise	41
Social support interventions	41
Workplace interventions	43
Mindfulness-based interventions	43
Psychological interventions for depression, anxiety and stress.....	44

Digital interventions.....	44
Organisational interventions	45
Other workplace interventions.....	45
Digital interventions.....	46
Primary care	48
Prevention interventions	49
Social prescribing (did not meet inclusion criteria)	50
Awareness raising interventions.....	50
DISCUSSION.....	54
Strengths and limitations of the review	61
Implications for policy and practice.....	62
CONCLUSIONS	65
REFERENCES	66
References for the main report	66
References for the reviewed studies	79
EVIDENCE TABLES	103
List of tables	103

Executive Summary

INTRODUCTION

Good mental health is an integral component of population health and wellbeing and contributes to the functioning of individuals, families, communities, and the social and economic prosperity of society (WHO Comprehensive Mental Health Action Plan 2021-2030). Mental health promotion is concerned with strengthening protective factors for good mental health, enhancing supportive environments and enabling access to skills, resources and life opportunities that promote the mental health and wellbeing of individuals and populations (Barry et al., 2019). A health promotion approach conceptualises mental health as a positive resource for everyday life and promotes interventions that seek to intervene at the level of strengthening individuals and communities, reorienting health services, and implementing intersectoral actions to remove the structural barriers to mental health at a societal level (Herrman et al. 2005; Friedli, 2009). Current policy frameworks endorse a whole-of-government and whole-of-society approach (WHO, 2021) and call for universal actions across the lifecourse and in key settings to ensure that the environments and conditions that create good mental health and reduce inequities are accessible to all (WHO Calouste & Gulbenkian Foundation, 2014).

This report presents the findings from an evidence synthesis on the impact of mental health promotion interventions across the lifecourse and in key settings. This review of reviews is concerned primarily with mental health promotion and primary prevention interventions for population groups across the following life stages; early years, school going children, young people, adults and older people in the settings of community, workplaces and primary care. This report was commissioned by the Department of Health and the findings will support the development of a National Mental Health Promotion Plan by the Department of Health, in the context of the Healthy Ireland Strategic Action Plan 2021-2025 and the implementation of Sláintecare.

METHODOLOGY

A Systematic Rapid Evidence Assessment (SREA) was undertaken with the aim of synthesizing current international evidence from systematic reviews and meta-analyses on the

effectiveness of mental health promotion interventions published in the last 5 years (2017-2021). The academic databases used to identify relevant systematic reviews and meta-analyses included Scopus, PubMed, PsychINFO, ASSIA and the Cochrane Database of Systematic Reviews. Reviews of randomised and non-randomised controlled trials were eligible for inclusion. The primary outcomes of interest were mental health, social and emotional wellbeing, and psychological functioning. In addition, information was provided (where available) on broader outcomes including educational, health, social and economic outcomes. A quality assessment of the systematic reviews and meta-analyses was conducted using the JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses (Joanna Briggs Institute, 2017). Quality assessment was conducted by two researchers, with a third researcher reviewing 10% of the studies.

RESULTS

The initial search of academic databases returned 5285 results, of which 168 reviews, including 111 meta-analyses and 57 systematic reviews, were included in the evidence synthesis. The reviews were grouped into the following categories: early years and parenting interventions (n=44); school-based interventions (n=24); community-based interventions for young people (n=21), adults (n=9), and older adults (n=18); workplace interventions (n=31); digital interventions (n=11); primary care interventions (n=3); and awareness raising interventions (n=7). The key findings from these reviews are outlined below.

Early years and parenting interventions

- Universal and targeted prevention interventions using various approaches, such as cognitive behavioural therapy (CBT), psychoeducation, mindfulness and mind-body interventions, are effective in reducing maternal depression and stress in the perinatal period. They can be delivered successfully by community members and primary care nurses. However, evidence on the effectiveness of mobile interventions is limited.
- Interventions for enhancing mother-child relationship and responsive caregiving in the first three years of life show improvements in early child development and parenting outcomes.
- There are a limited number of interventions focusing on the needs of fathers or same sex couples.

- Parenting interventions lead to improvements in parenting skills, parental stress and child behavioural outcomes. They can be delivered remotely, however, direct contact may be necessary for positive effects among more disadvantaged groups.
- Targeted multicomponent parenting interventions reduce the risk of mental health problems in high-risk children with parents with a mental health problem.
- There is consistent evidence that universal preschool curriculum-based social and emotional learning (SEL) interventions improve social and emotional competences and reduce behavioural and affective problems in preschool aged children. The curricula need to have an intensive focus on SEL to produce positive outcomes for children from low-income families.

School-based interventions

- Universal skill-based programmes are effective in improving short-term and long-term outcomes for students, particularly at primary level.
- Prevention programmes are effective in reducing symptoms of depression, anxiety and stress when delivered at a targeted level.
- There is some evidence for the positive effects of mindfulness-based programmes, particularly for older adolescents.
- Few reviews report evidence of effectiveness of interventions for diverse and more vulnerable groups of students and minority groups.
- Whole-school skill-based programmes that include a community component are particularly effective in producing positive outcomes for students.

Community-based interventions for young people

- A range of psychological interventions, both universal and targeted, including CBT-based approaches, psychoeducation, and multiple modalities delivered face-to-face, online, and in group-based formats, have been found to impact positively on young people's mental health outcomes, including anxiety, depression, emotional wellbeing and self-esteem.
- Studies indicate the usefulness of mindfulness-based interventions in improving depression and anxiety problems for children and adolescents.

- Physical activity interventions show positive effects on psychological wellbeing and reduce depression and anxiety symptoms in non-clinical populations of children and young people.
- A range of other intervention approaches, such as social skills training, mentoring and nature-based interventions, were also found to lead to positive mental health and wellbeing outcomes, although further research in these areas needs to be strengthened.
- Overall, there is a lack of review level evidence concerning the impact of mental health promotion interventions for specific populations of young people, including sexual and gender minority youth, and young people who experience homelessness, social marginalisation and other vulnerabilities.

Community-based interventions for adults

- Physical activity interventions show potential in improving mental and physical health among healthy and clinical populations, as well as among migrant and asylum seeker populations.
- Mindfulness interventions are effective in improving social and emotional wellbeing and reducing symptoms of anxiety, depression and distress when delivered to community-based adult and college student samples, particularly among younger participants and those with no pre-existing mental health condition.
- ‘Job Clubs’ may be effective in reducing depression among unemployed people as well as assisting them in finding employment.
- Social capital interventions show potential in improving mental health and social wellbeing, however, further research in this area is required.
- Interventions for improving the built environment show limited mental health benefits, and further research is required to better understand how best to measure the mental health impact of these interventions.
- Further research is needed on mental health promotion interventions for marginalised and minority populations such as homeless people, asylum seekers, migrant populations and members of the Travelling community.

Community-based interventions for older adults

- Mind-body interventions (e.g., Yoga, Tai Chi and Qigong) and mindfulness are effective in improving mental health outcomes such as depression and health related quality of life among older adults.
- Various forms of programmed exercise are an effective means of improving both physical and mental health-related quality of life for older adults, with evidence of improvements in anxiety for older women.
- Social support interventions, which include support groups, peer support, social activities, and befriending schemes delivered in community settings, lead to positive impacts on quality of life, wellbeing and self-perceived health. Interventions with a group component were found to impact particularly on alleviating social isolation and loneliness. However, technological interventions were also found to have a positive effect on loneliness, perceived social support and wellbeing for older adults.
- A range of other intervention approaches may have positive benefits on psychological wellbeing and quality of life, including horticultural therapy, participation in formal education and learning (including creative arts, educational courses etc.), memory strategy training for healthy older adults, and self-care interventions.
- Evidence from a mix of intervention approaches suggest that certain intervention factors influence the likelihood of positive outcomes, including meeting individual needs and preferences; continuous adjustment to level of functioning; including a focus on social elements or group-based interventions; extent and intensity of the interventions; the involvement of health professionals.
- Overall, there is a paucity of studies focusing on younger older adults, or on specific groups of older people, such as those who are marginalised or experience disadvantage, and a general lack of diversity in the type and range of structured interventions that have been evaluated to date using robust evaluation methods.

Workplace interventions

- The evidence on the effectiveness of workplace interventions focuses mainly on individual interventions and there is a sparsity of evidence on the effectiveness of organisational interventions on employee mental health and wellbeing.

- Mindfulness-based interventions are effective in improving a range of mental health and wellbeing outcomes in employees, however, their use with more diverse workers, including those working in male dominated sectors, needs to be further studied.
- Group-based cognitive behavioural therapy, particularly when delivered in combination with other approaches, is effective in reducing symptoms of depression in universal or targeted populations within the workplace setting.
- Technology-based interventions for reducing stress and depression are effective when delivered in workplace settings, with effect sizes comparable to those of digital interventions in general.
- The only meta-analysis on organisational interventions reported significant small effects on work engagement. The effectiveness of individual interventions on work related outcomes was not consistently measured.

Digital interventions

- There is robust evidence showing that computerised CBT has a small significant effect on symptoms of depression across universal and targeted populations of both adolescents and adults, with face-to-face support being linked to better outcomes.
- There is strong evidence that the Deprexis individually tailored CBT intervention has a moderate effect on reducing symptoms of depression across clinical and community-based populations, with effect sizes being comparable to other traditional intervention approaches. However, the implementation of Deprexis as a preventative intervention and within the Irish context needs to be further studied.
- Interventions using other approaches, such as ACT, mindfulness and serious games, also show potential in improving mental health and wellbeing.

Primary care

- Targeted CBT is effective in preventing depression in adults when delivered in primary care settings by primary care staff or mental health professionals.
- There is some evidence that targeted interventions delivered in the primary care setting prevent mental health and behavioural problems in children and young people,

particularly, when the support is extended outside the clinical setting through booster or follow-up sessions.

- Social prescribing interventions show potential in improving social isolation, loneliness, connectedness and subjective wellbeing, however, there is a need for more robust studies, as well as systematic measurement of outcomes across studies to strengthen the evidence base.

Awareness raising interventions

- The identified interventions focused mainly on identifying symptoms of mental disorders and help-seeking and there was a lack of review level evidence concerning the impact of public awareness raising campaigns focusing on positive mental health.
- Mental Health First Aid (MHFA) has a moderate to strong effect on improving mental health related knowledge and increasing confidence in helping a person with a mental health difficulty, however, findings regarding its impact on stigmatising attitudes is inconsistent. Furthermore, there is a lack of evidence that the intervention impacts on trainees' helping behaviour or the mental health of the recipient of the helping behaviour.
- Mental health literacy interventions for adolescents and young adults, when delivered in educational settings, improve mental health literacy, and possibly attitudes and public stigma. Their impact on help-seeking behaviours is less clear.
- Interventions aiming to improve help seeking for mental health difficulties are effective among adults who are at risk of, or have, mental health difficulties, however, further research is needed to examine their effectiveness with other population groups.

DISCUSSION AND CONCLUSIONS

The synthesis of findings from this review of 111 meta-analyses and 57 systematic reviews shows that there is evidence from well conducted studies that high quality interventions can lead to positive mental health and wellbeing outcomes for individuals and population groups across the lifecourse and in diverse settings. There is well established and consistent evidence concerning the positive impact of interventions focusing on early years, family support, parenting and school-based programmes, including for children and families

experiencing disadvantage. Although the current evidence is less robust, the review findings are supportive of the potential of a range of well-designed workplace and community-based interventions, including those delivered digitally and in primary care settings.

It is clear from these findings that mental health promotion and primary prevention interventions, implemented across diverse health, education, employment and community sectors, have the potential to promote population mental health and wellbeing and lead to range of positive health and social outcomes. Supporting the delivery of these evidence-informed practices will be critical to their effective implementation, as will developing the evidence base on their implementation, outcomes, cost-effectiveness and equity impact in the Irish context. Contextualising and translating the evidence into effective actions tailored to the needs of priority population groups across diverse cultural and socio-economic contexts in Ireland is a critical area for further development. Improving the quality of evaluation studies for community-based and cross-sectoral social change level interventions is needed in order that knowledge from good quality research can inform how best practices can be developed, sustained and mainstreamed at a scale and scope that will make a critical difference at a population level. The implementation of evidence-based mental health promotion interventions will need to be anchored and advanced within the broader context of supportive intersectoral policies and actions that address health and social inequities in order to ensure that the conditions and environments that create and support good mental health and wellbeing are accessible to all.

Evidence Synthesis of Impact of Mental Health Promotion

INTRODUCTION

This report presents the findings from an evidence synthesis on the impact of mental health promotion interventions that was commissioned by the Department of Health. A Systematic Rapid Evidence Assessment (SREA) was undertaken with the aim of synthesizing the current international evidence on the effectiveness of mental health promotion interventions. This review is concerned primarily with mental health promotion and primary prevention interventions delivered in key settings for population groups across the lifecourse. Building on previous evidence synthesis, this review aims to provide an update on the more recent evidence, with a particular focus on meta-analyses and systematic reviews published in the last five years. The findings from this evidence synthesis will support the development of a National Mental Health Promotion Plan by the Department of Health, in the context of the Healthy Ireland Strategic Action Plan 2021-2025 and the implementation of Sláintecare.

Background

Good mental health is an integral component of population health and wellbeing and contributes to the functioning of individuals, families, communities, and the social and economic prosperity of society (WHO Comprehensive Mental Health Action Plan 2021-2030). Mental well-being is recognized as an integral component of the sustainable development agenda (UN, 2015) and is explicitly referenced in Goal 3 as a critical element of ensuring healthy lives and promoting wellbeing for all people across the life course. Mental health is defined as “a state of well-being in which the individual realises his or her own abilities, copes with the normal stresses of life, works productively and fruitfully, and makes a contribution to his or her community” (WHO, 2001, p.1). As mental health is determined by multiple biological, psychological, social, economic, cultural and environmental factors, which interact in complex ways, a comprehensive systems-based approach is needed for understanding and addressing these determinants at a population level. The accumulation of positive and negative determinants of mental health across the life course indicates the need to address determinants at each stage of life in order to reduce exposure to conditions which increase vulnerability to

poor mental health and increase access to positive life experiences, resources and environments that will create and enhance positive mental health and wellbeing. A life-course approach, which takes into account the differential exposure to risk and protective factors throughout life, calls for universal actions employing a settings-based approach in order to improve the conditions in which people are born, grow, live, work and age (WHO and Calouste Gulbenkian Foundation 2014).

Promoting positive mental health and preventing mental-ill health is increasingly acknowledged as being integral to improving population health and wellbeing at a societal level. Population mental health is recognised as a major public health issue for this century. Poor mental health is a leading cause of disability worldwide, accounting for 35% of the global economic burden of non-communicable diseases, more than cardiovascular disease, cancer or diabetes (Bloom et al., 2011; Whiteford et al., 2015). The COVID-19 pandemic has had profound impacts on population mental health (Kelly, 2020; Salari et al., 2020; Vindegaard et al., 2020; Xiong et al., 2020), resulting in rising rates of depression, anxiety, post-traumatic stress symptoms, and increases in suicidal thoughts and behaviours (Cénat et al., 2021; Sher 2020). These negative impacts have also resulted in widening inequities for particular population groups, including people with existing mental health difficulties and those already experiencing health and social inequities due to homelessness, racism, exclusion, discrimination, and stigma (Bambra et al., 2020). This has underscored the urgent need for a population level approach to mental health, whereby universal and targeted mental health promotion interventions are made available that will support people in protecting and enhancing their mental health and wellbeing and provide the necessary supports and resources to reduce mental health inequities (IUHPE, 2021).

A health promotion approach reframes the challenge of improving population mental health from a deficit model of illness to a broader understanding of mental health as a positive concept and a resource for living with relevance for the whole population (Barry et al., 2019). Mental health promotion interventions intervene at the level of strengthening individuals and communities, reorienting health services, and promoting intersectoral actions to remove the structural barriers to mental health at a societal level (Herrman et al. 2005; Friedli, 2009). Current policy frameworks endorse a whole-of-government and whole-of-society approach (WHO, 2021) and call for universal actions across the life course to ensure that the conditions

that create good mental health and reduce inequities are accessible to all (WHO Calouste and Gulbenkian Foundation, 2014).

Mental health promotion and primary prevention

Mental health promotion is concerned with strengthening protective factors for good mental health, enhancing supportive environments and enabling access to skills, resources and life opportunities that promote the mental health and wellbeing of individuals and populations (Barry et al. 2019). Mental health promotion re-conceptualises mental health in positive rather than in negative terms and is concerned with the delivery of effective policies and programmes designed to reduce mental health inequities in an empowering, collaborative and participatory manner. While prevention programmes are primarily concerned with the reduction of the incidence and prevalence of mental disorders, mental health promotion focuses on the process of enabling and achieving positive mental health, reducing inequities and enhancing wellbeing and quality of life for individuals, communities and society in general.

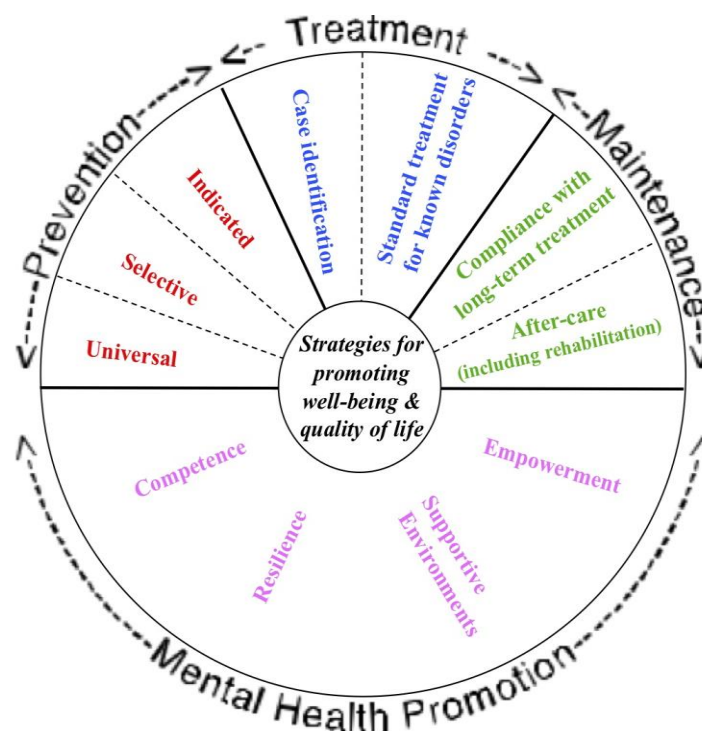
Mental health promotion endorses a competence enhancement perspective and seeks to address the broader social determinants of mental health (Barry, 2009). In keeping with the fundamental principles of health promotion as articulated in the Ottawa Charter (WHO, 1986), this calls for integrated approaches including interventions at the level of individuals, families and communities and ‘upstream’ policy interventions across the non-health sectors in order to reduce structural barriers to mental health. This perspective underscores the importance of developing supportive environments and settings for good mental health, e.g., in homes, schools, workplaces and communities, re-orienting existing services and advocating the development of mentally healthy public policy designed to promote and protect positive mental health at a population level.

Prevention interventions aim to reduce the incidence, prevalence or seriousness of targeted mental health problems and mental disorders, such as depression, anxiety, and suicide. Primary prevention is distinguished from secondary prevention, with the latter focusing on early detection and treatment of mental disorders, while tertiary prevention aims to reduce disability and enhance recovery of people with mental disorders. A prevention framework developed by Mrazek and Haggerty (1994) places prevention activities in the wider mental health

intervention spectrum of treatment, maintenance and rehabilitation. Three main categories of primary prevention are identified:

- Universal interventions - provided to whole populations
- Selective - targeting individuals or population groups at increased risk of developing a mental disorder
- Indicated - targeting high-risk individuals or population groups with minimal but detectable signs or symptoms of a mental disorder.

This framework was adapted by Barry (2001) to include interventions focussing on promoting positive mental health within the mental health intervention spectrum (see Figure 1). Mental health promotion is depicted as the largest component of the circle, given its universal relevance, and is connected with the other intervention areas through a unifying central element centred on strategies for promoting wellbeing and quality of life.



Barry, M.M. (2001) *International Journal of Mental Health Promotion*, 3(1) 25-34.

Figure 1: Modified mental health intervention spectrum, adapted from Barry (2001).

Interventions promoting positive mental health have universal relevance across all population groups, can result in impressive long-lasting positive effects on multiple areas of functioning, and also have the dual effect of reducing risk for mental ill-health (Jané-Llopis et al., 2005). Such interventions would also appear to hold the greatest promise as cost-effective strategies (Knapp et al., 2011; Le et al., 2021). There is consensus that there are clusters of known risk factors and protective factors, and there is considerable evidence that interventions can reduce identified risk factors and enhance known protective factors (Herrman et al., 2005). For these reasons, interventions with the explicit goal of promoting positive mental health and wellbeing through enhancing protective factors and reducing risk factors, offer a feasible and sustainable approach to addressing population mental health needs.

Irish policy context

Promoting population mental health is increasingly recognised as an integral part of improving overall health and wellbeing within the policy context in Ireland. The Healthy Ireland national policy framework (Department of Health, 2013) outlines a ‘whole-of-government’ and ‘whole-of-society’ approach to achieving the vision of *‘A healthy Ireland, where everyone can enjoy physical and mental health and wellbeing to their full potential, where wellbeing is valued and supported at every level of society and is everyone’s responsibility’* (p. 6). Ireland’s national mental health policy *Sharing the Vision: A Mental Health Policy for Everyone* (Department of Health, 2020) adopts a population-based approach to mental health and endorses the importance of promoting positive mental health, resilience and psychological wellbeing through intersectoral actions across the lifecycle. *Sharing the Vision* also contains a commitment to develop a National Mental Health Promotion Plan that will provide a framework of reference and the overarching context for all mental health promotion in Ireland (Department of Health, 2020, p. 26).

To support the cross-sectoral implementation of the Healthy Ireland framework, a strategic action plan was launched in 2021, which brought a focus on life-long wellbeing, prevention of illness and reduction of health inequalities through addressing a settings-based approach and empowering people and communities in looking after their own health and wellbeing. One of the priority focus areas for the Healthy Ireland Strategic Action Plan 2021-2023 (Department of Health, 2021) is to implement the recommendations of *Sharing the Vision*, including the development of a coordinated approach to mental health promotion. In order to underpin and inform the development of a National Mental Health Promotion Plan, the Department of Health

commissioned an evidence synthesis to obtain the most recent evidence on the impact of mental health promotion interventions across the life-course, and in the context of the settings where people work, live, learn and play.

Review Aim

This review builds on a growing body of international evidence which indicates that interventions that promote population mental health and wellbeing, when implemented effectively, can produce long-term benefits for individuals, families, and communities across a range of mental health, social wellbeing, health, educational, and economic outcomes (Barry et al., 2019). Evidence syntheses, meta-analyses and systematic reviews identify a number of high-quality interventions that have produced consistent evidence of their effectiveness and the feasibility of their implementation (Barry et al., 2017a; Clarke et al., 2015; Petersen et al., 2015; Rickwood & Thomas, 2019; Sheridan & Elhinney, 2016). These interventions span population groups across the lifecourse from infancy to adulthood and include actions that can be delivered across different settings such as the home, school, workplace, community, primary care and health services, and digital platforms.

The key aim of this review of reviews is to synthesize the current international evidence on the effectiveness of mental health promotion interventions aimed at enhancing the mental health and wellbeing of population groups across the lifecourse and in key settings. This review is concerned primarily with mental health promotion and primary prevention interventions across the following population life stages; early years, school going children and young people, adults and older people in the settings of community, workplaces and primary care.

METHODOLOGY

This rapid review synthesises international evidence from systematic reviews and meta-analyses on the effectiveness of mental health promotion interventions published in the last 5 years (2017-2021). The review examines the evidence of mental health promotion and primary prevention interventions delivered across the life course (children, young people, adults, older people) in key settings including at home, childcare, school, communities, workplaces and primary care.

Study design

This synthesis is a Systematic Rapid Evidence Assessment (SREA), which is focused on systematic reviews and meta-analyses with a limited search. The limited time scale of the project and the large body of research literature in the area means limiting the scope of the review. Reviews of interventions that span the continuum of evidence, including RCTs and studies with robust quasi-experimental designs, were eligible for inclusion. The primary outcomes of interest were mental health, social and emotional wellbeing, and psychological functioning. In addition, information was provided (where available) on broader outcomes including educational, health, social and economic outcomes.

Search strategy

The academic databases used to identify relevant systematic reviews and meta-analyses included Scopus, PubMed, PsychINFO, ASSIA and the Cochrane Database of Systematic Reviews. All searches were conducted in October-November 2021 by one researcher. The search strategy combined search terms relevant to the outcomes of interest (*mental OR psychological OR emotional OR social OR depress* OR stress OR anxiety OR resilien* OR flourish* OR happiness OR mindfulness OR "coping skills"*) with review terms (*"systematic review" OR meta-analysis OR synthesis*) in the title of the document and terms related to intervention (*intervention OR program* OR training OR therapy*), promotion/prevention (*promoti* OR prevent* OR universal OR enhance OR support* OR improv* OR targeted OR selective OR indicated*) and effectiveness (*effect* OR efficacy OR outcome* OR impact*) in the abstract/title of the document. Different spellings of the same word were searched where relevant (e.g., meta-analysis AND meta analysis). A more limited search focusing specifically on older people was conducted by another researcher, to confirm that all relevant studies were captured in the wider search.

Eligibility criteria

Systematic reviews and meta-analyses will be included in the review if they:

- Published from 2017 to 2021
- Published in English
- Included studies using robust study design (RCT, high quality quasi-experimental)
- Addressed the promotion of mental health and wellbeing or the primary prevention of common mental health and behavioural problems.

Studies were NOT included if they:

- Included studies without a control group or qualitative studies
- Addressed the treatment of mental, emotional or behavioural problems
- Addressed the prevention of bipolar disorder or psychosis, screening for common mental health problems or treatment of trauma
- Focused on interventions delivered in clinical settings
- Reviewed interventions targeted at individuals with disability or underlying conditions (including chronic or infectious diseases, diagnosable mental health problems, neurobiological or developmental disorders) or carers of individuals with disability or underlying conditions
- Focused on interventions delivered in low- and middle-income countries
- Included interventions for various populations and settings, as this makes it difficult to draw conclusions regarding to whom and where interventions are effective.

Reviews that included both treatment and prevention interventions were included if less than 30% of the interventions were treatment focused and/or the findings were presented separately for treatment and prevention interventions. In this case, only the findings for prevention interventions were considered for inclusion.

Study selection

The initial screening by title was conducted by two researchers, with the identified studies exported to Mendeley. All exported references were then screened by abstract and categorised

based on setting/population group by one researcher. The final set of studies were selected based on full text, with another researcher reviewing the rationale for including or excluding each study.

Data extraction and synthesis

A narrative synthesis was used to analyse the findings from the selected studies. Findings from the reviews were entered into tables for systematic reviews and meta-analyses developed a priori. Data extraction was completed by three researchers, with one training the others and overseeing the process of data extraction for populating the evidence tables. Data extraction was duplicated for 10% of the studies to ensure consistency across researchers. Findings from systematic reviews were reported narratively, whereas effect sizes were reported for meta-analyses. The population group, setting of delivery, number of studies reviewed, and outcomes of interest were also reported. Implementation findings were reported where available.

Quality assessment

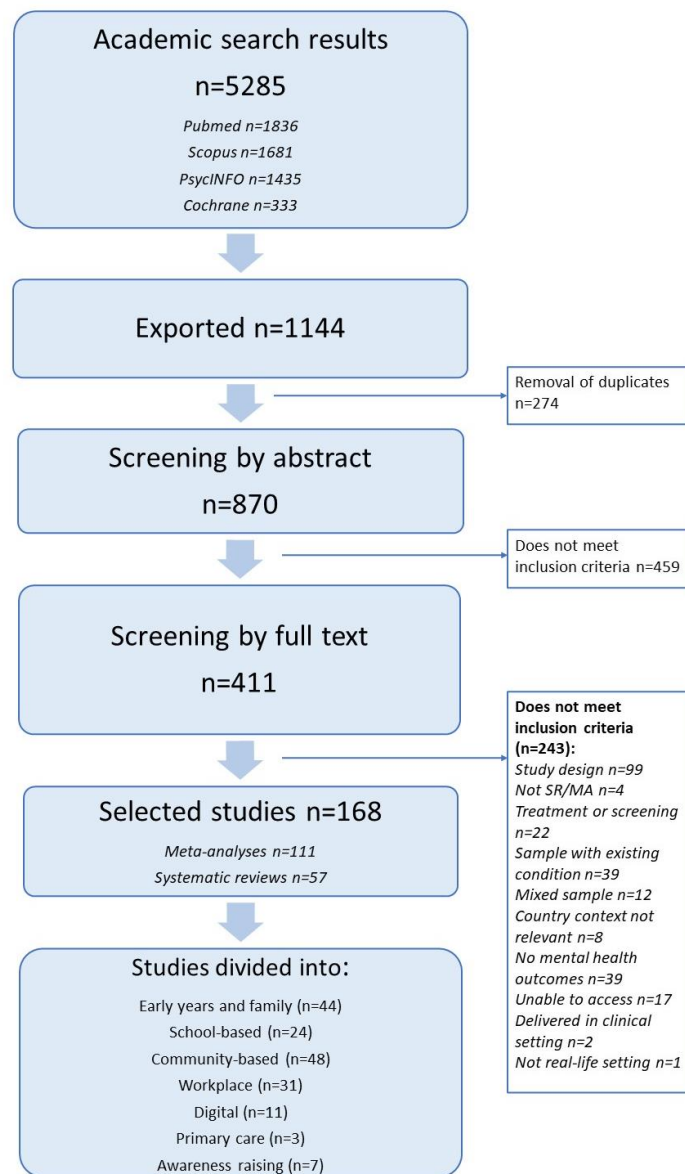
A quality assessment of the systematic reviews and meta-analyses was conducted using the JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses (Joanna Briggs Institute, 2017). The reviews were rated low (0-5), moderate (6-8) or high (9-11) quality. Quality assessment was conducted by two researchers, with a third researcher reviewing 10% of the studies. Any discrepancies were resolved by discussion.

RESULTS

Selection of studies

The initial search of academic databases returned 5285 results, of which 1144 studies were exported to the Mendeley reference management software. After the removal of duplicates, 870 papers remained and were screened by abstract. Of these 459 studies did not meet the inclusion criteria, and the remaining 411 studies were reviewed by full text for inclusion. The final set of studies included 168 reviews including 111 meta-analyses and 57 systematic reviews. A flowchart of the study selection process is presented in Figure 2.

Figure 2. Flowchart of search results



Early years and parenting interventions

Thirty-one meta-analyses and thirteen systematic reviews were included in this review. Three of the reviews were of moderate quality and the remaining reviews were of high quality. The included studies reviewed the following interventions; maternal mental health in the perinatal period (n=20); family support interventions in infancy and early years (n=7); parenting interventions (n=9); and preschool interventions (n=7). Nearly half (47%) of the reviews focused on interventions for maternal perinatal depression.

Key findings:

- Universal and targeted prevention interventions using various approaches, such as cognitive behavioural therapy (CBT), psychoeducation, mindfulness and mind-body interventions, are effective in reducing maternal depression and stress in the perinatal period. They can be delivered successfully by community members and primary care nurses. However, evidence on the effectiveness of mobile interventions is limited.
- Interventions for enhancing mother-child relationship and responsive caregiving in the first three years of life show improvements in early child development and parenting outcomes.
- There are a limited number of interventions focusing on the needs of fathers or same sex couples.
- Parenting interventions lead to improvements in parenting skills, parental stress and child behavioural outcomes. They can be delivered remotely, however, direct contact may be necessary for positive effects among more disadvantaged groups.
- Targeted multicomponent parenting interventions reduce the risk of mental health problems in high-risk children with parents with a mental health problem.
- There is consistent evidence that universal preschool curriculum-based social and emotional learning (SEL) interventions improve social and emotional competences and reduce behavioural and affective problems in preschool aged children. The curricula need to have an intensive focus on SEL to produce positive outcomes for children from low-income families.

Perinatal interventions for maternal mental health

There were sixteen meta-analyses and four systematic reviews that focused on interventions to improve maternal mental health in the perinatal period. The majority of the interventions focused on the antenatal rather than postnatal period.

The findings indicate that various types of universal psychological interventions (CBT, interpersonal therapy [IPT], psychoeducation, mindfulness, etc.), delivered in both group and individual formats, can be used to reduce maternal distress and depression among pregnant women (Missler et al., 2021; Yasuma et al., 2020). The evidence is strongest for interventions based on CBT (Yasuma et al., 2020), however, alternative approaches, such as mind-body interventions and music therapy (Corbally & Wilkinson, 2021; Corbjin Van Willenswaard et al., 2017; Guo et al., 2021; Sanchez-Polan et al., 2021; Zhu et al., 2021) also appear to improve symptoms of depression and stress among pregnant women. There is also evidence that interventions that are delivered antenatally may prevent post-natal depression, although further high-quality research is needed in this area (Missler et al., 2021; Yasuma et al., 2020). There is a lack of evidence on the impact of the interventions on maternal anxiety or other mental health or wellbeing outcomes.

Psychological support and/or CBT delivered by nurses (McCabe et al., 2021; Wang et al., 2021) or peers (Huang et al., 2020) can reduce maternal depression in the antenatal and postpartum period. Exercise interventions may also be effective in reducing symptoms of depression in the postpartum period especially for women with elevated symptoms of depression (Carter et al., 2019; Lin et al., 2018). There is limited evidence on the effectiveness of mobile interventions for maternal mental health (Saad et al., 2021; Tsai et al., 2021), with few commercially available apps being clinically tested (Tsai et al., 2021).

Family support interventions in infancy

Five meta-analyses and three systematic reviews focused on family support interventions aiming to improve parent-child interactions and infant care to support healthy child development. These interventions were delivered using various approaches (e.g., home visiting by nurses, video feedback, infant massage) and in various settings, making it difficult to draw firm conclusions regarding which interventions are most effective and how they should be delivered.

A comprehensive review and meta-analysis of 102 parenting interventions from pregnancy to the first three years of life showed that such interventions have a significant positive effect on a range of early child developmental and parenting outcomes (Jeung et al., 2021). Small to moderate effects were reported for children's cognitive development, language development, motor development, social-emotional development, attachment and reduction in problem behaviours. Significant improvements in parenting knowledge, parenting practices and parent-child interaction were also reported, with moderate to large effect sizes, but no significant impact on parental depression was detected. Stronger effects were reported for interventions that focused on responsive caregiving than those that did not. Interventions were found to be effective across various settings (home, community, clinic) and country contexts. These findings from Jeung et al. (2021) were not replicated in two other meta-analyses (Adina et al., 2021; Rayce et al., 2020), however, a significantly smaller number of intervention studies were included in these reviews.

Findings from a systematic review suggest that interventions may need to have an additional focus on maternal health and wellbeing to produce positive outcomes for maternal mental health (Walrop et al., 2021). Sangsawang and colleagues (2019) found that interventions based on various approaches, such as home visiting and infant massage, can reduce symptoms of postpartum depression among adolescent mothers (Sangsawang et al., 2019), although further research is needed to better understand determinants of intervention effectiveness as some, but not all interventions produced positive outcomes. Family support interventions may also improve maternal and paternal perceptions of relationship quality, when combined with a marital functioning component (Park et al., 2020), however, further studies are needed to support these findings. There is limited evidence of the impact of existing interventions on mental health outcomes for fathers (Goldstein et al., 2020; Jeung et al., 2021; Suto et al., 2017), with few interventions targeting the needs of this population specifically.

Parenting interventions

Nine studies reviewed interventions aiming to improve parenting skills and/or reduce parental stress. Three of these reviews focused specifically on families with parental mental health problems, with the overall aim to reduce the risk of mental health difficulties among the children. Parenting interventions target families with children of two years and over and generally aim to reduce problem behaviours among children.

A meta-analysis of the Irish Parents Plus intervention (Carr et al., 2017) showed improvements in child behavioural adjustment and parental satisfaction and stress, with effect sizes concurrent with the evidence-based parenting intervention Triple P (Sanders et al., 2014). The Parents Plus intervention was designed for clinical settings but can also be delivered in community settings, with findings from the meta-analysis indicating that it is more effective for younger children with less severe problems.

Two of the meta-analyses and one systematic review focused on parenting interventions delivered remotely. The findings indicate that digital interventions, including those based on CBT, Triple P and psychoeducational parent-child interaction, are effective in improving parental knowledge and satisfaction (Flujas-Contreras et al., 2019), with effects lasting up to two years post-intervention (Hansen et al., 2019). However, direct contact may be necessary to achieve positive outcomes for youth (Hansen et al., 2019) and when targeting socially disadvantaged parents (Harris et al., 2020). Multicomponent interventions for children of parents with mental health problems, that include CBT, psychoeducation and family process components, can significantly reduce children's risk of developing mental health difficulties in the future (Hanges et al., 2021, Lannes et al., 2021; Loechner et al., 2017).

Preschool interventions

Universal curriculum based SEL interventions were consistently shown to improve social and emotional competencies and reduce problem behaviours in preschool children (Blewitt et al., 2018; Luo et al., 2020; Yang et al., 2018), with effect sizes ranging from small to moderate. These interventions are mostly delivered by pre-school teachers and either teach social emotional skills through structured group activities or by integrating instruction into daily routines. The inclusion of a parenting component was linked to better outcomes (Luo et al., 2020). For low-income children, curricula that did not have an intensive focus on social- and emotional skills did not produce positive effects and high implementation fidelity was also linked to better outcomes (Yang et al., 2018). The evidence on SEL interventions when delivered in a targeted manner to preschool children with behavioural or emotional challenges is less strong (Blewitt et al., 2019). Yoga and mindfulness show potential in improving children's ability to regulate attention, emotion, and behaviours (Sun et al., 2021), however, more high-quality studies in this area are needed.

CASE STUDIES: Examples of evidence-based early years interventions delivered in Ireland

Community Mothers is an Irish home-visiting intervention delivered by trained peers, aiming to improve maternal self-esteem and confidence in child rearing during the first year of the child's life (Johnson et al., 1993). It is a feasible and cost-effective intervention leading to long-term positive child and maternal outcomes for disadvantaged families (Johnson et al., 2002). For further information, please see <https://www.khf.ie/community-mothers-programme/>

Parents Plus is a suite of systemic, solution-focused group-based parenting interventions for treating child behavioural problems (Carr et al., 2017). They can be delivered in clinical or community settings for children aged 2-17 years with or without developmental disabilities. For further information, please see <https://www.parentsuplus.ie/>

Triple P Positive Parenting Programme is a parenting and family support intervention aiming to create healthy family environments and prevent and address problem behaviours among children and adolescents. Triple P is a multilevel system consisting of universal and targeted interventions delivered using a population approach. The intervention has a well-established international evidence-base of effectiveness (Sanders et al., 2014). In Ireland, it has been shown to reduce child social, emotional and behavioural difficulties on a population level (Doyle et al., 2018). For further information, Please see <https://www.triplep.net/glo-en/home/> for further information on Triple P and <http://askaboutparenting.ie/> for information on the implementation of Triple P in Laois, Offaly, Longford and Westmeath.

Incredible Years are group training programmes for parents, teachers and children, aiming to prevent and treat behavioural problems and promote social and emotional competence in children. The Incredible Years parenting interventions are targeted for parents of children aged 0-12 years and have been shown to be effective in reducing problem behaviours among children from diverse families (Mentinga et al., 2013). For more information, please see: <https://incredibleyears.com/>

School-based interventions

There were 24 school studies included in this analysis, of which 15 were meta-analyses and 9 were systematic reviews. Of the studies reviewed, a majority of these were rated as strong quality (75%) while the remaining reviews were of moderate quality (25%), a higher proportion of which, were systematic reviews. Of the included studies, a majority (66%) examined

interventions that were conducted in both primary and secondary school settings. The other studies were either delivered in primary schools only (17%) or secondary schools (17%). Based on the included reviews, the meta-analyses and systematic reviews were classified into three main categories: universal skill-based interventions (n=9); prevention interventions (n=10); and mindfulness interventions (n=3). Other less common interventions were also identified including physical activity (n=1) and peer-led interventions (n=1).

Key findings:

- Universal skill-based programmes are effective in improving short-term and long-term outcomes for students, particularly at primary level.
- Prevention programmes are effective in reducing symptoms of depression, anxiety and stress when delivered at a targeted level.
- There is some evidence for the positive effects of mindfulness-based programmes, particularly for older adolescents.
- Few reviews report evidence of effectiveness of interventions for diverse and more vulnerable groups of students and minority groups.
- Whole-school skill-based programmes that include a community component are particularly effective in producing positive outcomes for students

Universal skill-based interventions

Of the nine reviews on universal skill-based interventions, there were three meta-analyses and five systematic reviews. Universal skill-based interventions were described as either social and emotional learning (SEL) programmes, resilience-based programmes or mental health promotion interventions. Findings indicated that universal skills-based programmes delivered in schools were shown to positively impact on a number of outcomes for students including enhancing students' social and emotional skills, resilience, positive social behaviour, positive attitudes, coping skills, self-efficacy and mental wellbeing as well as reducing a number of negative psychosocial outcomes such as depression, anxiety, problem behaviours and substance use (Taylor et al., 2017; Dray et al., 2017; Fenwick-Smith et al., 2018; Higgen et al., 2021; van de Sande et al., 2019). Studies that assessed the long-term effects of these programmes found that positive outcomes were maintained up to 18 months post-intervention (Taylor et al., 2017; Dray et al., 2017; van de Sande et al., 2019). There was also evidence that

SEL programmes can have a positive impact on students' academic outcomes (Corcoran et al., 2018; Taylor et al., 2017), however, many of these studies originate from the US and, therefore, their applicability to the Irish context should be considered with caution.

Findings from Taylor et al. (2017) revealed that participants' race, socio-economic background and school location did not impact on programme outcomes, suggesting that universal SEL programmes can produce long-term outcomes for diverse groups, including minority groups. However, it is worth noting that very few other studies report evidence of the effectiveness of school-based interventions for diverse and more vulnerable groups and further research with these populations is required (Clarke et al., 2021). Larger effect sizes were seen for younger children compared to adolescents (Taylor et al., 2017; MacKenzie & Williams, 2018). This indicates that interventions for adolescents need to be adequately developed and adapted to meet the needs of the target population and maximise outcomes (Yeager et al., 2017). A study by van de Sande (2019), which examined the effects of SEL programmes on adolescents, found that very few studies assessed the impact of these programmes on social and emotional wellbeing outcomes. This is also likely to contribute to the lower effect of these programmes for adolescents compared to that found for younger children (van de Sande, 2019). Implementation quality is also an important predictor of programme effectiveness (MacKenzie and Williams, 2018), highlighting the need for training and monitoring.

Two of the universal skill-based reviews examined whole-school type interventions (Goldberg et al., 2019 & Sheridan et al., 2019). Goldberg et al. (2019) found positive effect sizes for participants in relation to their social and emotional adjustment, behavioural adjustment and internalising symptoms. Inclusion of a community component within the delivery of whole-school interventions was found to be a moderator for higher effect sizes. Another meta-analysis by Sheridan et al. (2019) reviewed family-school partnership interventions across pre-school level to secondary school. This review found that these interventions demonstrated improvements for both students' social behavioural competence and mental health outcomes, particularly when they were delivered in rural/non-urban settings. Just under half of the studies (46%) in the review by Goldberg et al. (2019) reported on programme implementation, highlighting the need to focus on monitoring the quality of implementation alongside outcomes in future studies.

Prevention Interventions

A total of eight meta-analyses and two systematic reviews of prevention interventions were identified, focusing mainly on the prevention of depression, anxiety, stress, and behavioural problems. Most of these reviews explored the effects of both universal and targeted school-based prevention programmes. Based on the results of the review studies, prevention programmes when delivered in a targeted manner were found to be effective in reducing a number of negative mental health outcomes including, anxiety, depression, psychological stress, behaviour problems and substance misuse (Feiss et al., 2019; Kambara & Kira, 2021; Sanchez et al., 2018; Van Loon et al., 2020; Werner-Seidler et al., 2017, 2021; Waldron et al., 2018).

Several reviews found that prevention programmes were more effective when delivered at a targeted level and that there was a lack of effect for universal programmes (Caldwell et al., 2019; Feiss et al., 2019; Sanchez et al., 2018; Van Loon et al., 2020; Kambara & Kira, 2021; Werner-Seidler et al., 2017, 2021). The FRIENDS programme was the only universal prevention programme to consistently demonstrate positive effects (Johnstone et al., 2018; Waldron et al., 2018) limiting the evidence for other prevention programmes delivered universally. Other moderators that were shown to strengthen outcomes included; programmes being integrated into the curriculum, implemented multiple times per week, targeting externalising behaviours, and incorporating contingency management strategies (Sanchez et al., 2018).

Mindfulness Interventions

Two meta-analyses and one systematic review examined the effectiveness of school-based mindfulness interventions on mental health outcomes. The results of the reviewed studies indicated that mindfulness interventions may be effective in improving mental health and wellbeing outcomes, however, further research on these types of interventions is necessary.

A study by Carsley et al. (2018) reviewed 24 mindfulness interventions for adolescents and found effects for mental health and wellbeing outcomes were more significant at both post-intervention and follow-up for older adolescents (15-18 years) compared to younger adolescents. This study also found that effects were more likely to be sustained long-term when the programme was delivered by a trained teacher versus an outside facilitator. Another study by Vekety et al., 2021, examined the effects of 21 mindfulness interventions for primary school

students and found some evidence for a reduction in inattentiveness and hyperactive-impulsive behaviour, however, this was only significant by teachers' ratings, not ratings by children themselves or parents. Children who were at-risk for these behaviours were more likely to demonstrate positive effects than those who were not. A further study by Segal et al. (2021) examined mindfulness interventions across both primary and secondary low-income schools and found some evidence for improvements in behaviours, emotional regulation and perceived stress, however, findings were inconsistent across the reviewed studies.

Additional Interventions

Although universal skill-based, prevention and mindfulness interventions were the most frequent types of programmes included in this review, other interventions also emerged that are worth noting. There was some evidence that physical activity interventions can improve mental health and wellbeing, particularly among older children (Andermo et al., 2020). There was weak evidence of effectiveness for peer-led mental health interventions with some studies even reporting adverse effects of these programmes for both recipient and peer leader outcomes (King & Fazel, 2021).

CASE STUDY: *MindOut*

MindOut is a school-based social and emotional learning programme for senior cycle post-primary school students (15-18 years) in Ireland. The programme was developed by researchers at the Health Promotion Research Centre, NUI Galway in collaboration with the Health Service Executive (HSE).

The structured programme consists of 13 weekly sessions, which are intended to be delivered by teachers within the Social Personal Health Education (SPHE) curriculum. It is based on CASEL's five core competencies for social and emotional learning i.e., self-awareness, self-management, social awareness, relationship management and responsible decision making (CASEL, 2015). The programme employs interactive teaching strategies (e.g., collaborative learning, structured games, scenarios, videos etc.) to engage students in developing a number of social and emotional skills.

The programme has been shown to be effective in producing positive outcomes related to students' social and emotional skills: reduced suppression of emotions and use of more positive coping strategies as well as mental health and wellbeing including a reduction in stress, depression and anxiety scores (Dowling et al., 2019). Follow-up studies revealed that implementation quality is a key predictor of programme effectiveness (Dowling & Barry, 2020a; Dowling & Barry 2020b).

Community-based interventions for young people

Seventeen meta-analyses and four systematic reviews on the effectiveness of community-based youth interventions were identified in the search. Interventions included both universal and targeted psychological approaches (e.g., CBT, psychoeducation, and a mix of modalities) to improve mental health outcomes such as emotional and social wellbeing, anxiety and depression (n= 9). Reviews of specific intervention approaches were also included such as; mindfulness-based interventions (n = 4), physical activity (n=3), social skills training (n=2), mentoring (n=1), nature-based interventions (n=1) and early intervention approaches for young people at higher of risk of mental ill-health (n=1). The quality of the reviews was rated as being high and one was rated as moderate (n= 1), however, in some cases the quality of the primary studies was mixed, involving small sample sizes and including some non-controlled study designs.

Key findings

- A range of psychological interventions, both universal and targeted, including CBT-based approaches, psychoeducation, and multiple modalities delivered face-to-face, online, and in group-based formats, have been found to impact positively on young people's mental health outcomes, including anxiety, depression, emotional wellbeing and self-esteem.
- Studies indicate the usefulness of mindfulness-based interventions in improving depression and anxiety problems for children and adolescents.
- Physical activity interventions show positive effects on psychological wellbeing and reduce depression and anxiety symptoms in non-clinical populations of children and young people.
- A range of other intervention approaches were also found to lead to positive mental health and wellbeing outcomes including the following:
 - Social skills training interventions can have a positive impact on emotional and interpersonal social skills and on antisocial behaviour.
 - Mentoring programmes were found to lead to positive effects on young people's emotional well-being.

- Nature-based interventions, including outdoor adventures, green educational breaks and outdoor play etc. are found to lead to positive psychosocial benefits for children and adolescents.
- Early intervention approaches are found to be effective in improving functioning for young people at higher risk of poor mental health.
- Overall, there is a lack of review level evidence concerning the impact of mental health promotion interventions for specific populations of young people, including sexual and gender minority youth, and young people who experience homelessness, social marginalisation and other vulnerabilities.

Universal and targeted psychological interventions

Seven meta-analyses examined the impact of universal and targeted psychological interventions on the mental health of young people. A large-scale meta-analysis by Salazar de Pablo et al. (2020) reported that both universal (62%) and selective interventions can promote good mental health in young people. This review of 276 randomised and non-randomised control studies reported small to medium effects sizes on the following outcomes; mental health literacy (ES=0.685, $p<0.001$), emotions (ES=0.541, $p<0.001$), self-perceptions and values (ES=0.49, $p<0.001$), quality of life (ES=0.457, $p=0.001$), cognitive skills (ES=0.428, $p<0.001$), social skills (ES=0.371, $p<0.001$), physical health (ES=0.285, $p<0.001$), sexual health (ES=0.257, $p=0.017$), academic/occupational performance (ES=0.211, $p<0.001$) and attitude towards mental disorders (ES=0.177, $p=0.006$).

Targeted interventions, employing approaches such as CBT, psychoeducation, and combined modalities, delivered in group, individual and online formats, were found to lead to significant improvements in young people's anxiety (Baourda et al., 2021; Lawrence et al., 2017) and depression levels (Davaasambuu et al., 2020; Bourke et al., 2021). Psychological interventions for insomnia were also found to result in improved depression (Kodsi et al., 2021). A systematic review reported that behavioural activation interventions were found to be particularly effective for young people with subthreshold depression when delivered in group formats (Malik et al., 2021), and a review by Wolpert et al. (2019) reported mixed evidence for the effects of computerised CBT on depression and anxiety. Both universal and targeted self-regulation techniques were found to have a positive effect on self-esteem and internalising behaviours for adolescents (van Genugten et al., 2017).

Mindfulness-based interventions

Meta-analyses reviewing the impact of mindfulness-based interventions report significant improvements in depression for children and adolescents with and without depressive symptoms (Reangsing et al., 2021a; Dunning et al., 2019) and a small overall mean effect in reducing anxiety symptoms (Odgers et al., 2020; Dunning et al., 2019). However, a meta-analysis by Ruiz-Íñiguez et al., 2020 found a non-significant overall effect on anxiety for a mixed group of young people (72% of whom were non-clinical), pointing to the high heterogeneity concerning the type programmes and their implementation, together with the inclusion of studies with small sample sizes.

Physical activity interventions

Physical activity interventions (such as mind-body aerobic, resistance, football, exergames etc.) were reported to have positive effects on adolescents' psychological wellbeing, including moderate effects on anxiety (Carter et al., 2021) and positive impacts on depression, anxiety, self-esteem and positive affect (Rodríguez-Ayllon et al., 2019). A systematic review by Alves et al., 2021 also reported positive psychological outcomes for high intensity interval training for both boys and girls.

Other intervention approaches

Social skills training interventions are reported to have a significant, small positive effect on young people's emotional and interpersonal social skills (de Mooij et al., 2020) and small positive effects on antisocial behaviour and crime for both universal and indicated programmes (Beelman et al., 2020). Both meta-analyses involved a large number of RCTs (97 and 113 respectively) and included cognitive-behavioural approaches, social and emotional learning and behavioural programmes. The findings concerning the long-term impacts of these interventions is unclear.

Mentoring programmes are found to result in small to moderate positive effects on young people's emotional well-being. In a moderate quality meta-analysis by Claro et al., 2021, mentoring programmes, involving one-to-one contact with adult mentors, were found to lead to a small negative effect ($d = 0.20$) on negative affect, a medium negative effect on internalizing behaviour ($d = 0.45$), and a medium positive effect on self-esteem ($d = 0.45$). However, the included studies in this review were considered to be of mixed quality and included small sample sizes.

Nature-based interventions are reported to produce positive psychosocial benefits from across different types of nature experiences, including outdoor adventures, green educational breaks and outdoor play, for children and adolescents. A systematic review by Mygind et al., (2019) found conditional support for benefits on self-esteem, self-efficacy, resilience, academic and cognitive performance.

Early intervention approaches are also found to be effective in improving functioning for young people at higher risk of poor mental health. A systematic review by Read et al., 2018 found evidence to support the use of approaches such as cognitive remediation, CBT, supported educational and employment, and family psychoeducation.

A number of review studies, that were of too low a quality to be included in this synthesis, indicated potentially promising findings for young people who are marginalised and vulnerable. These include the positive impact of psychological interventions (such as CBT) when adapted for sexual and minority youth (Sheinfil et al., 2019) and the benefits of social support and social skills interventions on social isolation and loneliness among vulnerable young people (experiencing homelessness, sexual identity issues, mental health problems).

CASE STUDY: *Big Brothers Big Sisters Mentoring Programme*

Big Brother Big Sisters is an international youth mentoring programme (Grossman 1998; 2002) that matches a volunteer adult mentor with an at-risk child or adolescent in order to to promote positive youth development and delay or reduce antisocial behaviours. The programme aims to help young people reach their potential through the establishment of positive relationships and trust. Interactions are aimed at; decreasing or delaying antisocial activities; improving academic performance, attitudes and behaviours; improving relationships with family and friends; strengthening self-concept; and providing social and cultural enrichment. The programme has been positively evaluated and is implemented in a number of countries, including in Ireland (Child and Family Research Centre, 2010).

Further details on this mentoring programme are accessible from: <http://www.bbs.org/>

Community-based interventions for adults

Four meta-analyses and five systematic reviews on the effectiveness of community-based interventions were identified in the search. All the meta-analysis focused on individual level interventions (mindfulness and physical activity), whereas the systematic reviews included reviews of social capital, environmental and job search interventions. The quality of the reviews was moderate to high; however, the quality of the primary studies was mostly low. Furthermore, several reviews of promising interventions were identified, but did not meet the strict inclusion criteria for this study. These are briefly discussed at the end of this section.

Key findings

- Physical activity interventions show potential in improving mental and physical health among healthy and clinical populations, as well as among migrant and asylum seeker populations.
- Mindfulness interventions are effective in improving social and emotional wellbeing and reducing symptoms of anxiety, depression and distress when delivered to community-based adult and college student samples, particularly among younger participants and those with no pre-existing mental health condition.
- ‘Job Clubs’ may be effective in reducing depression among unemployed people as well as assisting them in finding employment.
- Social capital interventions show potential in improving mental health and social wellbeing, although further research in this area is required.
- Interventions for improving the built environment show limited mental health benefits, and further research is required to better understand how best to measure the mental health impact of these interventions.
- Further research is needed on mental health promotion interventions for marginalised and minority populations such as homeless people, asylum seekers, migrant populations and members of the Traveller community.

Individual level interventions

Physical activity

Four meta-analyses focused on physical activity interventions. Yoga and resistance training were shown to reduce symptoms of anxiety in healthy and clinical populations (Gordon et al., 2017; Zoogman et al., 2019). Exercise enhanced by virtual reality (e.g., Wii, virtual biking) was shown to improve physical but not psychological outcomes, such as calmness, tension, enjoyment and energy (Ng et al., 2019). One meta-analysis focused on the effectiveness of physical activity interventions on psychological outcomes among migrant and asylum seeker populations (Purgato et al., 2021). Although these interventions showed potential in improving general functioning and self-efficacy/coping and in reducing symptoms of depression, anxiety and posttraumatic disorder, it is clear that evidence on a wider range of culturally acceptable mental health promotion interventions and supports for asylum seekers and migrants is needed.

Mindfulness

Six meta-analyses examined the impact of mindfulness interventions on the mental health and wellbeing of students and community dwelling adults. Mindfulness-based interventions using various formats were found to be effective on a range of positive mental wellbeing outcomes, including prosocial behaviour (Berry et al., 2020), motivation (Donald et al., 2020), self-compassion (Golden et al., 2020) and wellbeing (Glante et al., 2021) as well as in reducing loneliness (Teoh et al., 2020), symptoms of anxiety, depression and psychological distress (Galante et al., 2021; Schumer et al., 2018). Effects on loneliness and pro-social behaviour were stronger for student populations than for adults (Berry et al., 2020; Teoh et al., 2020), whereas stronger effects on negative affectivity were reported for community-dwelling adults than college students (Schumer et al., 2018). High risk of bias in primary studies was common, and therefore, findings on the effectiveness of mindfulness interventions should be interpreted with caution.

Interventions for financial uncertainty

‘Job-clubs’ interventions, which are group-based job search and skills training interventions, show potential in improving symptoms of depression among unemployed people with effects lasting up to two years post-intervention, although findings are inconsistent across studies (Moore et al., 2017). Evidence on the effectiveness of other interventions, such as group CBT, debt advise, emotional competency training, guided imagery and expressive writing, among unemployed people is sparse.

Social and environmental level interventions

Further research is required on the effectiveness of social capital interventions (e.g., community engagement and educative interventions, and neighbourhood projects) and their transferability across different cultural and country contexts (Flores et al., 2018). Interventions that help participants develop self-awareness of their own social mapping and aim to strengthen social ties and community participation in decision-making, show potential in improving mental health and social capital among community members.

There is weak evidence on the effect of built environment interventions, such as urban regeneration, and the development of green or transport infrastructure, on the mental health and quality of life of community members (Moore et al., 2018). However, more robust research and alternative methods to measure outcomes are needed in this area.

CASE STUDY: *JOBS Programme*

The JOBS programme (Caplan et al. 1989) provides job-seeking skills to promote re-employment and to combat feeling of anxiety, helplessness and depression among people who are unemployed. Tested in large, randomised field studies, this 20-hour group-based training programme promotes positive mental health for unemployed workers, prevents the onset of depression among those at highest risk, and is cost-effective in terms of better employment outcomes, including better quality and higher paying jobs, resulting in increased economic benefits for participants and the State (Vinokur et al, 2002). This programme has been implemented successfully in the USA, China, Korea, the Netherlands and was scaled-up on a national level in Finland (Vuori et al. 2002). Adapted as Winning New Jobs (WNJ), the programme was implemented on a cross-border basis in Northern Ireland and the Republic of Ireland in collaboration with local training and employment and health agencies in the border region. An evaluation from a quasi-experimental trial showed significantly improved employment outcomes at 12 months follow-up and reduced economic hardship and enhanced inoculation against setbacks for programme participants (Reynolds et al. 2010).

Reviews not fully meeting the inclusion criteria

Reviews of a range of interventions that could be implemented in the community setting, such those based on music listening or singing (Luo et al., 2020; Daykin et al., 2021), expressive writing (Reinhold et al., 2018), nature exposure and green exercise (Lahart et al., 2019; Oh et al., 2017; Roberts et al., 2019) and positive psychology (Gregg & Cheavens, 2020; Koydemir et al., 2020; Lee et al., 2020), were also identified in the search. However, these reviews were

not included due to high heterogeneity in study populations, diversity in interventions and low quality of included studies. Furthermore, another systematic review was identified that focused on mental health outcomes of housing interventions for homeless people (Onapa et al., 2021), however, most participants had a diagnosed mental health condition and studies using various study designs were included in the review. This review did not find consistent evidence that housing interventions on their own improve psychological health among homeless people.

Community-based interventions for older adults

Twelve meta-analyses and six systematic reviews were included on mental health promotion interventions for older people. The selected reviews focused primarily on healthy older people (usually defined as aged 60 years or older) living in community settings. The majority of the reviews were of high quality with two of the meta-analyses rated as being of moderate quality. The included reviews were categorised as follows: mindfulness and mind-body interventions (n=5); programmed exercise (n= 4); social support interventions (n= 3); and a range of other approaches including participation in formal education (n= 1) and cognitive training (n=1); horticultural therapy (n= 1); self-care interventions (n=2); and a generic review of mixed intervention approaches (n = 1).

Key findings:

- Mind-body interventions (e.g., Yoga, Tai Chi and Qigong) and mindfulness are effective in improving mental health outcomes such as depression and health related quality of life among older adults.
- Various forms of programmed exercise are an effective means of improving both physical and mental health-related quality of life for older adults, with evidence of improvements in anxiety for older women.
- Social support interventions, which include support groups, peer support, social activities, and befriending schemes delivered in community settings, lead to positive impacts on quality of life, wellbeing and self-perceived health. Interventions with a group component were found to impact particularly on alleviating social isolation and loneliness. However, technological interventions were also found have a positive effect on loneliness, perceived social support and wellbeing for older adults.

- A range of other intervention approaches were found to have positive benefits on psychological wellbeing and quality of life, including horticultural therapy, participation in formal education and learning (including creative arts, educational courses etc.), memory strategy training for healthy older adults, and self-care interventions.
- Evidence from a mix of intervention approaches suggest that certain intervention factors influence the likelihood of positive outcomes, including meeting individual needs and preferences; continuous adjustment to level of functioning; including a focus on social elements or group-based interventions; extent and intensity of the interventions; the involvement of health professionals.
- Overall, there is a paucity of studies focusing on younger older adults, or on specific groups of older people, such as those who are marginalised or experience disadvantage, and a general lack of diversity in the type and range of structured interventions that have been evaluated to date using robust evaluation methods.

Mindfulness and mind-body interventions

In a high-quality meta-analysis by Weber et al. (2020), mind-body interventions (MBIs) using different forms of gentle exercise and meditative movements (such as Tai Chi, Qigong, Yoga, Pilates etc.) were found to result in small to moderate effect sizes for quality of life, depressive symptoms, fear of falling, and sleep quality among older adults without mental disorders. A significant larger effect on quality of life and depressive symptoms with increasing training frequency was found for Tai Chi and Qigong ($p=0.03$; $p=0.004$). Two further reviews indicate that yoga interventions can have positive effects for healthy older adults. A meta-analysis by Sivaramakrishnan et al., 2019 also reported small to moderate effects for physical function and health-related quality of life, including depression ($ES = 0.64$), perceived mental health ($ES = 0.6$), perceived physical health ($ES = 0.61$), sleep quality ($ES = 0.65$), and vitality ($ES = 0.31$). A systematic review by Chobe et al. (2021) also reported the positive role of yoga in improving cognitive and psychological health outcomes for older people.

Mindfulness meditation interventions (MMIs) were found in two meta-analyses to improve depression ($g = .65$), with MMIs involving guided meditation showing greater improvement compared to those without (Reangsing et al., 2021b), and to show positive impacts on quality of life for middle-aged and older women (Chen et al., 2021).

Programmed exercise

Four reviews examined the impact of various forms of programmed exercise for healthy older adults. Meta-analyses reported positive effects on symptoms of anxiety for middle-aged and older women (Martínez-Domínguez et al., 2018), however, no significant effects were found for perceived stress (Nigdelis et al., 2018). Resistance training (muscle strengthening activities) is reported as an effective means of improving both physical and mental health-related quality of life in older adults (Hart & Buck, 2019), while positive effects on psycho-emotional health (mental health, anxiety and stress tolerance) are reported for participation in sports such as boxing, fencing, judo, karate and taekwondo (Valdés-Badilla et al., 2021).

Social support interventions

Three systematic reviews reported on the impact of a range of social networks and social support interventions for healthy older adults. Coll-Planas et al. (2017) reported that interventions, which included support groups, peer support, social activities, and befriending schemes delivered in community settings, lead to positive impacts on quality of life, wellbeing and self-perceived health, however, no impact on loneliness was reported. Tong et al. (2021) found that interventions with a group component impacted positively in alleviating social isolation and loneliness. The potential of well-designed remote interventions was also highlighted and further supported in a review by Ollevier et al. (2002), which found that accessible computer systems and communication platforms have a positive effect on loneliness, perceived social support and wellbeing for older adults. A range of technologies related to emergency assistance, physical exercise and mental wellbeing technologies were also found to impact positively on mental health and health-related quality of life.

Other approaches

A number of meta-analyses also reported on the benefits of other intervention approaches for improved physical and psychological health. A small-scale review (N= 4 RCTs) by Lin et al. (2020) found that horticultural therapy can be effective in promoting emotional functioning, subjective social functioning and quality of life for older people.

A review by Noble et al. (2021) reported that participation in formal education and learning (including creative arts, computers, various education courses etc.) can lead to increased wellbeing and quality of life, healthy cognitive function, self-dependency, and a sense of belonging in later-life. Memory strategy training for healthy older adults (Hudes et al., 2019)

has been found to lead to improvements in psychological wellbeing and quality of life, alongside positive effects on metamemory.

Interventions aimed at improving daily life and preventing falls through environmental modifications in the home were found to result in small effects on activities of daily living but showed no effects on quality life or social participation (Lim et al., 2020). Self-care interventions for community-dwelling older adults (i.e., involving active engagement in a range of daily activities and the development and monitoring of care plans) are effective in producing positive outcomes such as self-rated health, reduced incidence of falls, and improvements in the mental subscale of quality of life, but with no significant impacts on depression (Wong et al., 2018).

A comprehensive review of 53 RCTs by Niclasen et al. (2019) covering a range of mental health promotion interventions (lifestyle, cognitive function, socially oriented interventions etc), found that while no single intervention approach could be recommended, there was strong evidence across studies to suggest that specific factors are critical for the positive effects of a given intervention. Specifically, interventions should meet individual needs and preferences, be continuously adjusted to level of functioning, and include a focus on social elements or group-based interventions. The extent and intensity of the interventions and the involvement of health professionals were also considered important for positive outcomes to be achieved.

CASE STUDY: Widow-to-Widow Programme: A Mutual Support Bereavement Programme

The Widow-to-Widow programme is a peer support bereavement programme where other widowed persons are the primary helpers providing support to the newly widowed still experiencing bereavement and the problems of coping with the loss of a loved one (Silverman, 1986). A community outreach service is provided by trained volunteer helpers who seek to support the newly widowed six weeks to two months after the death, focusing on promoting people's ability to cope with their loss and to deal effectively with the changes in their lives. Programme evaluation has demonstrated the feasibility of the mutual-help model and its acceptance by the newly widowed (Silverman 1986) and findings from a randomised controlled study in Canada (Vachon et al. 1980) indicate positive impacts on the process of adaptation to bereavement and reduced levels of distress. The programme was also found to be most effective for those at highest risk in terms of higher initial levels of distress.

Workplace interventions

Thirty-one reviews including nineteen meta-analysis and twelve systematic reviews examining the effectiveness of workplace mental health promotion interventions were identified. These included reviews of the following types of interventions: mindfulness (n=9), psychological interventions for depression, anxiety and distress (n=8), digital interventions (n=4), organisational interventions (n=1) and other approaches (n=9). Nine reviews (29%) focused specifically on health care staff. The quality of the reviews was mostly high, with four studies rated as moderate quality.

Key findings

- The evidence on the effectiveness of workplace interventions focuses mainly on individual interventions and there is a sparsity of evidence on the effectiveness of organisational interventions on employee mental health and wellbeing.
- Mindfulness-based interventions are effective in improving a range of mental health and wellbeing outcomes in employees, however, their use with more diverse workers, including those working in male dominated sectors, needs to be further studied.
- Group-based cognitive behavioural therapy, particularly when delivered in combination with other approaches, is effective in reducing symptoms of depression in universal or targeted populations within the workplace setting.
- Technology-based interventions for reducing stress and depression are effective when delivered in workplace settings, with effect sizes comparable to those of digital interventions in general.
- The only meta-analysis on organisational interventions reported significant small effects on work engagement. The effectiveness of individual interventions on work related outcomes was not consistently measured.

Mindfulness-based interventions

Of the nine reviews on mindfulness-based interventions, there were seven meta-analyses and two systematic reviews. Findings from the studies indicate that mindfulness-based interventions, when delivered in the workplace, reduce symptoms of anxiety and depression, reduce stress and burnout, and improve mental wellbeing with effect sizes ranging from small to medium and lasting up to 1-year follow-up (Bartlett et al., 2019; Lomas et al., 2019;

Vonderlin et al., 2020). Similar effect sizes were reported among health care professionals (Kang & Myung, 2021; Spinelli et al., 2019; Suleiman-Martos et al., 2020) and teachers (Klingbeil & Renshaw, 2018). However, these effect sizes may be inflated by publication bias and methodological issues in the primary studies. Furthermore, the effectiveness of mindfulness interventions has been examined mainly with female employees of large organisations and white-collar workforce (Bartlett et al., 2019), and their implementation among more diverse samples needs to be further studied.

Psychological interventions for depression, anxiety and stress

Three meta-analyses and five systematic reviews examined the effectiveness of psychological interventions for depression, anxiety and stress. The findings from the meta-analyses indicate that psychological interventions have a small to moderate effect on depression, anxiety and stress when delivered to universal or targeted populations (Bellón et al., 2019; Nigatu et al., 2019; Petrie et al., 2019), although the limited number of primary studies reduces the strength of these findings. The evidence is strongest for cognitive behavioural and mindfulness-based interventions. Delivering CBT in a group-based format is associated with lower attrition rates (Wan Mohd Yunus et al., 2017) and may also improve work performance (Ihara et al., 2021), although further research in this area is needed. Wan Mohd Yunus et al. (2017) conducted a systematic review of universal and targeted depression prevention interventions (n=22) and reported that although CBT-based interventions were the most common type of intervention used in the workplace, interventions that used a combination of approaches, such as CBT and coping flexibility, were most effective.

Three systematic reviews examined stress management interventions for high stress occupations, including nurses (Alkhawaldeh et al., 2019; Velana & Rinkenauer, 2021) and first responders (Wild et al., 2020). These interventions varied greatly in their approach, with cognitive behavioural, mindfulness and stress management interventions, and interventions that target trauma-related psychiatric risk factors, appearing most beneficial.

Digital interventions

Three meta-analysis and one systematic review examined the effectiveness of digital mental health interventions in the workplace setting. These interventions were mainly based on CBT, mindfulness or stress management, and had an overall small effect on depression and anxiety (Phillips et al., 2019; Stratton et al., 2017), which is comparable to the effect sizes reported for

digital interventions in general. Positive small effects were also reported for psychological wellbeing and work effectiveness (Carolan et al., 2017), and moderate effects for stress and burnout (Phillips et al., 2019). Stratton et al. (2017) found that mindfulness-based interventions achieved better outcomes than interventions based on CBT, whereas no difference in outcomes between different intervention approaches were found by Carolan et al. (2017). As with digital interventions in general, attrition with workplace digital interventions may be problematic, while guidance may improve engagement and outcomes (Phillips et al., 2019).

Organisational interventions

One meta-analysis focused on organisational interventions for employee wellbeing. Knight and colleagues (2017) conducted a meta-analysis of work engagement interventions, including personal resource building (focus on increasing personal strengths and resilience), job resource building (aiming to develop positive aspects of work environment), leadership training, and health promotion (aiming to improve employee wellbeing; mainly mindfulness-based interventions included in the review). They found a small significant positive effect for work engagement interventions on measures of work engagement, with group-based interventions being most effective. No differences in outcomes were found between the different types of interventions.

Other workplace interventions

Five meta-analyses and two systematic reviews were identified that did not clearly fit to any of the above intervention categories. These included reviews on mental health literacy training for managers (Gayed et al., 2018), social and emotional learning for teachers (Oliveira et al., 2021), spiritual interventions such as Tai Chi, Qigong and Reiki (De Diego-Cordero et al., 2021), interventions for subjective wellbeing (Sakuraya et al., 2020), interventions for improving physical and mental health among health care professionals (Melnyk et al., 2020; Otto et al., 2021), self-compassion training (Kotera & Van Gordon, 2021), nature-based interventions (Gritzka et al., 2020) and interventions for psychological capital (Lupsa et al., 2020). Due to the low number of high-quality primary studies in these reviews, it is hard to make any robust conclusions on the effectiveness of these various types of interventions.

For the mental health literacy training, significant effects were found on managers' mental health knowledge, non-stigmatising attitudes towards mental health and behaviour in supporting employees experiencing mental health problems, however, few studies measured

outcomes for employees (Gayed et al., 2018). Social and emotional learning interventions for teachers showed significant improvements in symptoms of burnout, however, they need to be tailored to the needs of teachers and focus on intrapersonal skills as well as interpersonal skills to be effective (Oliveira et al., 2021). Positive psychology and stress management interventions appear effective in improving components of psychological capital, including resilience, self-efficacy, optimism and hope (Lupsa et al., 2020), whereas further research is needed on the effectiveness of other type of interventions, such as self-compassion training (Kotera & Van Gordon, 2021), nature-based interventions (Gritzka et al., 2020) and spiritual interventions (De Diego Cordero et al., 2021).

CASE STUDY: *Mindfulness-Based Stress Reduction (MBSR)*

MBSR teaches mindfulness practices with a specific focus on applying mindfulness during stressful events. MBSR aims to decrease emotional reactivity and enhance cognitive reappraisal, thus changing an individual's reaction to stressful thoughts or events. The effectiveness of MBSR in reducing stress, depression and anxiety has been demonstrated with healthy adults in various settings, particularly among healthcare workers (Khoury et al., 2015).

MBSR provides training in mindfulness practices, such as body scan, sitting meditation and yoga and typically also includes psychoeducation. It is typically delivered in a group setting by trained facilitators, over 8-weeks, with one 2.5h session weekly and an additional one-day workshop (Grossmann et al., 2004). Home practice for is also encouraged. There is limited knowledge regarding the factors related to successful implementation of MBSR, with existing studies reporting a variety of delivery formats and amount of home practice.

Digital interventions

There were eight meta-analyses and three systematic reviews of digital interventions for improving mental health and wellbeing. Two systematic reviews received a moderate quality rating, and the remaining reviews were rated as high quality. Three of the reviews focused specifically on children and young people.

Key findings

- There is robust evidence showing that computerised CBT has a small significant effect on symptoms of depression across universal and targeted populations of both adolescents and adults, with face-to-face support being linked to better outcomes.
- There is strong evidence that the Deprexis individually tailored CBT intervention has a moderate effect on reducing symptoms of depression across clinical and community-based populations, with effect sizes being comparable to other traditional intervention approaches. However, the implementation of Deprexis as a preventative intervention and within the Irish context needs to be further studied.
- Interventions using other approaches, such as ACT, mindfulness and serious games, also show potential in improving mental health and wellbeing.

Findings from the meta-analyses indicate that computerised CBT interventions have an overall small effect on reducing symptoms of depression (Deady et al., 2017; Rigabert et al., 2020) and anxiety (Deady et al., 2017). Similar effect sizes were reported for universal and indicative/selective populations and for adolescents and adults (Garrido et al., 2019). The effectiveness of two computerised CBT interventions, MoodGYM and Deprexis, were examined in separate meta-analyses. Effect sizes for MoodGYM (Twomey & O'Reilly, 2017) were comparable to those reported in the general meta-analyses of computerised mental health interventions. However, considerably stronger effects on depression were reported for the Deprexis intervention (moderate effect $d=0.51$), in which intervention content is tailored to individual needs and preferences (Twomey et al., 2017; Twomey et al., 2020).

Other intervention approaches examined in the reviews included internet-based Acceptance Commitment Therapy (ACT) and mindfulness-based interventions. ACT was shown to have a small effect on depression, anxiety, quality of life and psychological flexibility (Thompson et al., 2021), with clinician support being linked to better outcomes. Mindfulness-based interventions when delivered digitally, were also shown to have small positive effect on symptoms of anxiety and depression, with slightly higher effects for stress and mindfulness (Victorson et al., 2020). However, publication bias was reported as being likely. There is also emerging evidence from a moderate quality systematic review that videogames, without a specific therapeutic focus, may induce positive emotions and reduce levels of stress (Pallavicini et al., 2018) and that serious games (digital mental health interventions using gaming approach)

may improve social skills among adolescents when delivered alongside other face-to-face approaches (Zheng et al., 2021). CBT and mindfulness Apps were also shown to reduce symptoms of depression in adolescents and young adults (Leech et al., 2021).

With regard to the implementation of digital interventions, face-to-face support was linked to better outcomes across the studies, with the exception of the Deprexis intervention, the outcomes of which were not significantly moderated by clinician support (Twomey et al., 2017). Low engagement and adherence with digital interventions may be an issue, particularly among adolescents and young people (Garrido et al., 2019).

CASE STUDY: *Deprexis*

Deprexis is a digital CBT intervention for preventing and treating depression. The intervention is tailored to individual needs and preferences. Participants complete six to ten modules, with the number and content of modules changing based on participant responses (Meyer et al., 2009). Although mainly based on the cognitive behavioural approach, the intervention also draws from other approaches, such as ACT, interpersonal therapy, mindfulness and positive psychology. The intervention is marketed as a treatment intervention for depression, and its application as a prevention intervention needs to be further studied. It can be used as a fully automated intervention or with the guidance of a clinician as part of routine care. The intervention was developed in Germany is available in five languages, including English. It is currently used within the German health care system.

For more information, please see <https://info.deprexis.com/>

Primary care

One meta-analysis and two systematic reviews examining the impact of primary care interventions were identified. One of the systematic reviews was focused on interventions for preventing mental health and behavioural problems in children and adolescents, and the other two reviews examined depression prevention interventions for adults. The meta-analysis was of high quality and the systematic reviews were of moderate quality. Furthermore, two reviews on social prescribing interventions were identified, however, these did not meet the strict

inclusion criteria for this study. Nevertheless, the findings are briefly discussed at the end of this section.

Key findings

- Targeted CBT is effective in preventing depression in adults when delivered in primary care settings by primary care staff or mental health professionals.
- There is some evidence that targeted interventions delivered in the primary care setting prevent mental health and behavioural problems in children and young people, particularly, when the support is extended outside the clinical setting through booster or follow-up sessions.
- Social prescribing interventions show potential in improving social isolation, loneliness, connectedness and subjective wellbeing, however, there is a need for more robust studies, as well as systematic measurement of outcomes across studies to strengthen the evidence base.

Prevention interventions

Findings from a high-quality meta-analysis (Conejo-Ceron et al., 2017) show that CBT for depression can be effectively delivered in primary care settings as a selective or indicated prevention intervention. The reported effect size was small but significant ($SMD = -0.163$), and similar whether the interventions were delivered by primary care staff or mental health professionals. Kuroda et al. (2021) examined the common elements of effective self-help primary care interventions, and found that interventions that incorporated cognitive restructuring, behavioural activation (both elements of CBT), homework assignments and weekly support from primary care staff or mental health professionals were more likely to be successful.

Rojas et al. (2019) examined primary care interventions for preventing mental health and behavioural problems in children from infancy to adolescence. A wide range of interventions were included in the review, which were either parent, family or youth focused and used strategies such as inter-active group sessions, telephone-based counselling, in-clinic one-on-one counselling, delivering educational materials, and online or technology assisted counselling sessions. The findings indicate that indicated and selective interventions for at-risk children and young people from pre-school age onwards, particularly when they include

booster sessions or follow-up support, can be effectively delivered in primary care settings to prevent mental health difficulties, substance misuse and risky sexual behaviours. Culturally specific interventions for ethnic minority youth also appear to be effective. However, due to the heterogeneity in interventions and the age of the target population, further research is needed to support these findings.

Social prescribing (did not meet inclusion criteria)

Two reviews of a range of quantitative and qualitative studies on social prescribing interventions were identified (Pescheny et al., 2020; Vidovic et al., 2021). Vidovic et al., 2021 reviewed fifty-one studies on the impact of social prescribing interventions, with most of the studies using a pre-post design (n=36) and only three studies using an experimental design with a control group. The study findings show the potential of social prescribing in improving social isolation, social connectedness, loneliness and subjective wellbeing, as well as reducing health care service use and building community capacity. However, there is a need for consensus on how to define these outcomes and to ensure that they are measured systematically across studies. This, along with conducting further research using high quality research designs that can prove a causal relationship between the intervention and outcomes, would help to strengthen the evidence base.

Awareness raising interventions

Four meta-analyses and three systematic reviews focusing on awareness raising and stigma reduction interventions were included in the study. These all achieved a high-quality appraisal score. Three of the reviews focused specifically on interventions for adolescents and young adults, and the remaining reviews included interventions for both adults and young people. The interventions were delivered in various settings, including educational settings, workplaces and in the community. Three of the studies reviewed effectiveness studies of the Mental Health First Aid (MHFA) intervention, one on interventions to promote help-seeking for mental health problems, and the remaining three reviews focused mainly on mental health literacy interventions delivered in educational settings. None of the reviews included public mental health campaigns.

Key findings

- Mental Health First Aid (MHFA) has a moderate to strong effect on improving mental health related knowledge and increasing confidence in helping a person with a mental health difficulty, however, findings regarding its impact on stigmatising attitudes is inconsistent. Furthermore, there is a lack of evidence that the intervention impacts on trainees' helping behaviour or the mental health of the recipient of the helping behaviour.
- Mental health literacy interventions for adolescents and young adults, when delivered in educational settings, improve mental health literacy, and possibly attitudes and public stigma. Their impact on help-seeking behaviours is less clear.
- Interventions aiming to improve help seeking for mental health difficulties are effective among adults who are at risk of, or have, mental health difficulties, however, further research is needed to examine their effectiveness with other population groups.
- There is a lack of review level evidence concerning the impact of public awareness raising campaigns focusing on positive mental health.

Mental Health First Aid (MHFA) aims to train members of the public to recognise and respond to mental health issues in the community (Morgan et al., 2019). Findings from three meta-analyses indicate that MHFA, when delivered to adults and young people in various settings (educational institutions, workplaces, community, digital) has moderate to strong effect on improving mental health related knowledge and confidence in helping a person with a mental health difficulty (Juang et al., 2021; Maslowksi et al., 2019; Morgan et al., 2018). Findings regarding the impact of the intervention in terms of improving stigmatising attitudes or increasing intentions to provide mental health first aid are inconsistent. There is limited evidence that the intervention impacts on trainee's behaviour or the mental health status of the recipient (Maslowski et al., 2019; Morgan et al., 2018).

Regarding the effectiveness of mental health literacy interventions for adolescents and young adults, the evidence indicates that interventions delivered in educational settings, with or without the help of technology, are effective in improving mental health knowledge and possibly attitudes and public stigma (Seedacket et al., 2020; Waqas et al., 2020), however, these improvements may not translate to increased help-seeking (Seedaket et al., 2020; Tay et

al., 2018). These interventions use psychoeducation and contact-based strategies, integrating various learning techniques, such as lectures, videos, quizzes, case studies and vignettes.

CASE STUDIES:

Mental Health First Aid (MHFA)

MHFA was developed in Australia but has been delivered worldwide, including in Ireland. The intervention aims to improve participants' knowledge about signs and symptoms of mental health problems, effective treatments and appropriate first aid strategies (Morgan et al., 2019). MHFA is generally delivered over two days in a group-based format and can also be delivered remotely (Davies et al., 2018). There are specific versions of the intervention for schools, workplaces and the community. The Youth MHFA is designed for adults working with children and young people, whereas the Teen MHFA is delivered to adolescents in school settings to support mental health among their peers (Hart et al., 2018).

For further information on the delivery of MHFA in Ireland, please see www.mhfaireland.ie

The Working Mind

The Working Mind is a Canadian multicomponent mental health awareness and stigma reduction intervention for workplaces. There are tailored interventions available for the health care sector, first responders, professional sportspeople, young people and for online delivery. There are also separate courses for employees and managers. The intervention is based on the mental health continuum model, aiming to increase mental health awareness, reduce stigma around mental ill-health, improve resilience and coping and create a more supportive working environment (Castro et al., 2015). Training is delivered over 1-2 days, preferably using a train-the-trainer model.

The Working Mind has been shown to lead to moderate reductions in stigma and improvements in self-reported resilience and coping abilities across various implementation sites (Dobson et al., 2019). However, intervention effectiveness is yet to be examined in a randomised controlled trial.

For further information, please see www.theworkingmind.ca

Xu and colleagues (2018) conducted a meta-analysis of 97 interventions for improving help-seeking for mental health problems. These interventions mainly focused on mental health literacy, destigmatisation or motivational enhancement. Significant improvements were reported for short-term formal help-seeking, self-help, mental health literacy and personal

stigma. However, interventions were only effective when delivered to adults with or at risk of mental health difficulties, but not when delivered to children, adolescents or the general public.

DISCUSSION

Mental health promotion interventions have been found to produce a range of mental health, social wellbeing, health, educational and economic outcomes for individuals, families and communities. This systematic rapid evidence assessment examined the international evidence, published in the last five years, on the effectiveness of mental health promotion and primary prevention interventions across the lifecourse and in key settings. This study identified 168 reviews, including 111 meta-analyses and 57 systematic reviews of interventions delivered in the home, school, community, workplace, primary care and digital settings. The findings from the review are discussed below, reflecting on previous research and the feasibility of implementing interventions in the Irish context.

Early years and parenting interventions for children and families

The findings from this review indicate a strong base of evidence from high-quality studies that early childhood and parenting interventions that focus on enhancing maternal mental health, the mother-child relationship and responsive caregiving in infancy, lead to improvements in maternal wellbeing and child developmental outcomes. This builds on the findings from previous reviews, which have shown the benefits of home visiting and family support interventions, particularly for more disadvantaged families, in areas such as improved parental attitudes, skills and behaviours, reduced child abuse, child cognitive and behavioural development and reduced incidence of low birth weight and health problems in older children (Casillas et al., 2016; Dalziel & Segal, 2012; Filene et al., 2013; Kendrick et al., 2000; Peacock et al., 2013; Sweet & Appelbaum, 2004). These interventions can be delivered by primary care staff or by trained peers, such as in the Community Mothers intervention (Johnson et al., 2000). Peer delivery may be particularly well suited for providing culturally acceptable support for ethnic minorities, such as members of the Traveller community (Fitzpatrick et al., 1997). Supporting healthy development in infancy and early childhood has the potential to lead to long-term positive social and emotional outcomes across the lifecourse (Barnett et al., 1995; Olds et al., 1997) and to reduce inequities in child development outcomes (Morrison et al., 2014). The findings also indicate that universal and targeted prevention interventions using various approaches, such as cognitive behavioural therapy, can reduce maternal distress and depression among pregnant women.

Parenting skills interventions targeting parents of children aged 2+ years, were shown to lead to improvements in parenting skills, parental stress and child behavioural outcomes, which

reflects the findings from previous reviews (Barlow et al., 2016; Britto et al., 2017; Furlong et al., 2012; Morrison et al. 2014). There are evidence-based parenting interventions currently available in Ireland, including Parents Plus, Triple P and Incredible Years, which can be delivered effectively in community and clinical settings. The Triple P Positive Parenting Program is also available for remote delivery with promising findings on its usability and effectiveness (Baumel & Faber, 2018). Although remote delivery may improve access to parenting support among the general public, the findings from this review indicate that direct contact may be necessary to achieve positive effects among more disadvantaged groups.

This review shows that additional evidence is needed to confirm the most effective intervention approaches for specific population groups, including children and families from diverse ethnic minority and cultural backgrounds and those exposed to poverty, violence, abuse and other adverse experiences. Furthermore, there are few evidence-based interventions focusing on the needs of fathers or same sex couples. Further research is also needed to better understand the factors related to effective delivery, in order to maximise the reach and impact of family support and parenting interventions for children and families most in need.

Preschool and school-based interventions

There was strong evidence that high-quality universal preschool and school-based social and emotional learning interventions lead to improvements in children's social and emotional skills, a reduction in problem behaviours and improvement in academic outcomes. These findings are also in line with previous reviews, which have assessed the impact of these types of programmes on mental health outcomes (Durlak et al., 2011; Sklad et al., 2012; Clarke et al., 2015; Barry et al., 2017b; Adi et al., 2007; Zins et al., 2004). In keeping with previous findings (Durlak et al., 2011), larger effect sizes were seen for younger children compared to adolescents. Therefore, interventions should start in preschool and carry through to primary and secondary school.

High-quality universal SEL interventions in preschool and school are instrumental in improving social and educational outcomes for children, particularly those from disadvantaged backgrounds (Calhoun et al., 2020; Sanders et al., 2020). However, findings from this and previous reviews (Durlak et al., 2011) emphasise that preschool and school-based interventions need to have an explicit focus on social and emotional learning to produce desired outcomes. Furthermore, interventions are most successful when they are delivered by teachers and integrated into a whole-school approach through which social and emotional skill development

is a school-wide effort and skills are reinforced across multiple contexts within the school (Jones & Bouffard, 2012; Weare & Nind, 2011; Barry et al., 2017b). Therefore, to strengthen and sustain outcomes for students, skill-based programmes should be embedded within a whole-school approach involving coordinated action between the curriculum, school ethos and environment, policies and community partnerships.

Whereas social and emotional learning interventions are well suited for universal delivery in schools, the review findings indicate that prevention interventions for depression and anxiety are best delivered in a targeted manner. Stronger effects for prevention programmes with targeted groups versus universal groups were reported in the identified reviews, which is likely associated with the difference in baseline symptoms between students of the general population and those that are selected for an intervention (Clarke et al., 2021). Given this finding, prevention programmes will be more beneficial if delivered in a more targeted way for students at higher risk, whereas universal interventions that focus on positive skill-based approaches such as SEL are most effective for general delivery in schools.

Anti-bullying interventions are visibly absent in this review, this is possibly because they generally do not measure mental health outcomes (Kuosmanen et al., 2019). The exception is the KiVa antibullying intervention, which uses a whole-school approach and includes a social and emotional learning curriculum and has shown to result in positive effects on mental health, social and academic outcomes (Williford et al., 2012). Training for the delivery of KiVa in Ireland is available on <https://ireland.kivaprogram.net>

Community-based interventions

Reviews of community-based interventions for young people, adults and older adults were identified in this study. Overall, the quality of the evidence on the effectiveness of community-based interventions was lower than for school-based interventions. However, the lack of evidence does not necessarily indicate the absence of effective interventions but may rather point to low resources for conducting robust evaluation studies. Delivering interventions in the community is particularly important for reaching more vulnerable and hard-to-reach populations, such as those who are not engaged in education or employment. However, review level evidence on interventions targeting these populations was scarce, with the exception of one review examining physical activity interventions for migrant and asylum seeker populations and one review examining interventions for those who are experiencing financial

hardship. There is, therefore, a need for further evidence on the effectiveness of community-based interventions for more diverse populations.

Universal and targeted psychological interventions (e.g., CBT, psychoeducation) and mindfulness, when delivered in community settings, were found to have a positive impact on mental health and wellbeing outcomes for young people and adults. In keeping with previous reviews (Park et al., 2014; Pascoe et al., 2018), interventions based on physical activity were also shown to have a positive impact on the mental health and wellbeing of young people, adults and older adults. Physical activity interventions have the potential to be implemented at scale in community settings as well as in residential aged services (Rickwood & Thomas, 2019). Physical activity was also shown to be effective in improving psychological wellbeing among migrant and asylum seeker populations, although it is clear that evidence on a wider range of culturally acceptable interventions to support the mental health and wellbeing of these population groups is needed.

Other intervention approaches, such as nature-based interventions, social skills training, creative arts interventions, and mentoring, also show potential in improving the mental health and wellbeing of community members. However, the evidence for such interventions is generally of much lower quality, with many reviews not meeting the inclusion criteria for this study. These interventions are usually delivered through non-governmental organisations (NGOs), community groups or youth organisations, which are often low resource settings without the expertise or the funding available to conduct robust evaluation of their services. Therefore, there is a need to support the evaluation of existing interventions, such as Men's Sheds, community gardens and the wide range of mental health support services and innovative interventions delivered by the Irish youth sector and voluntary organisations, to fully appreciate the important role that community-based organisations play in supporting population mental health and wellbeing.

There was limited evidence that community development interventions that build social capital and infrastructure improve the mental health of the community members. Considering the potential of community development interventions to enhance, not only the wellbeing of individual participants, but also the entire community, further exploration of how to best to implement and measure the impact of such interventions is needed (Trickett et al., 2011).

A range of social and community support interventions were found to improve social participation for older people, supporting the findings from previous studies (Cohen-Mansfield et al., 2015). Participation in physical activity, formal education, horticultural therapy and self-care programmes were also found to lead to positive impacts on a range of psychological outcomes. Overall, there is a need for evidence on a more diverse range of interventions for older people than have been included in systematic reviews to date. For example, there is lack of review studies focusing on the impact of improved housing, income, active retirement, bereavement support, leisure, cultural participation, creative arts etc. A number of systematic reviews have explored the impact of initiatives such as age-friendly cities and communities (Sánchez-González et al., 2020) and intergenerational programmes (Giraudeau & Bailly, 2019; Krzeczowska et al., 2021; Peters et al., 2021), however, the quality of evidence was too weak to be included in this review.

There is also a lack of studies focusing on younger older adults or studies designed for particular groups of older people, e.g., related to gender, ethnicity, rurality, living conditions etc. Niclasen et al. (2019) in their review called for further research that can provide a more nuanced picture of older adults as a heterogeneous group of persons who can be active, independent and contribute positively to society. Such a focus offers considerable scope and potential for the development of a wider range of mental health promotion interventions for diverse groups of older people. There is a need to expand the current base evidence on mental health promotion for older people to include a broader range of intervention approaches, especially for more active and independent older people and for those experiencing disadvantage and social exclusion.

Workplace interventions

The findings from this review demonstrate that a wide range of individual interventions can be successfully implemented in workplaces to promote employee mental health and wellbeing and reduce mental health related stigma. However, the impact of individual interventions on work-related outcomes (such as work performance and absenteeism) needs to be further studied. Previous reviews indicate that for individual level interventions to produce wider work-related outcomes, they need to be complemented with organisational strategies that emphasise employee involvement and engagement, managerial commitment, and integrating interventions into existing organisational systems (Bhui et al., 2012; Daniels et al., 2017; Knight et al., 2019). There is also a scarcity of evidence on the effectiveness of organisational

interventions on employee mental health and wellbeing, with the only meta-analysis identified in the current review examining the impact of individual and organisational interventions on work engagement (Knight et al., 2017). No differences in outcomes were found between the different types of interventions. However, in a more recent systematic review, which did not meet the inclusion criteria for this study, Knight and colleagues (2019) found the strongest evidence for bottom-up individually focused health promotion interventions and job crafting interventions (in which individuals have greater autonomy to fit the job characteristics to their needs).

Mindfulness-based workplace interventions currently have the greatest level of research evidence to support their effectiveness, particularly in terms of reducing stress and anxiety. However, further research is needed to understand which intervention components are associated with effective delivery and whether mindfulness-based interventions can be delivered to more diverse groups of employees, as there is an overrepresentation of highly educated female participants in existing studies. CBT is the most common type of intervention used for preventing depression at the workplace and can be successfully delivered in a variety of settings and formats. Previous reviews also show that CBT is feasible for delivery in male dominated blue-collar workplaces (Hogg et al., 2021). The use of technology may help to increase the reach of mindfulness and CBT-based interventions, as well as assist in delivering interventions with high fidelity. However, digital delivery without support is likely to result in higher attrition rates.

Reviews of other types of workplace interventions were identified in the current study, most of which showed potential in improving employee wellbeing. Mental health awareness and anti-stigma interventions, when delivered to managers, were shown to improve mental health related knowledge, attitudes and behaviours, with similar findings reported among employees in previous reviews (Dobson et al., 2019; Hanisch et al., 2016). However, there is limited evidence on their impact on employee mental health and wellbeing. The Canadian Working Mind intervention (Castro et al., 2015) provides a structured approach on how to deliver multicomponent mental health literacy interventions in the workplace for both managers and employees. Evidence from non-controlled studies indicates that the intervention can be effectively delivered in various workplace settings (Dobson et al., 2019), however, its effectiveness is yet to be studied in a controlled study or outside Canada.

Digital interventions

The evidence from the current review shows that psychological interventions can be effectively delivered with the use of technology, with the evidence for computerised CBT (cCBT) being the strongest. Computerised interventions for preventing depression and anxiety were shown to have an overall small effect on preventing depression and anxiety, which is in line with findings from previous reviews (Griffiths et al., 2010). However, findings from the current review indicate that some computerised interventions may be more effective than others. Significantly higher effect sizes were reported for the Deprexis intervention, which is a depression prevention intervention designed to be delivered as part of routine care. Furthermore, its effectiveness was not moderated by therapist support. Deprexis differs from other cCBT interventions in that the content is tailored to individual needs and preferences. The delivery of Deprexis in primary care in Ireland could be further explored, as well its transferability for implementation in community settings. The scaling-up of online delivery of interventions has potential by extending the reach and impact of community-based mental health promotion and primary prevention programmes.

Primary care

There was a handful of reviews of primary care interventions, mainly focusing on depression prevention. However, it should be noted that many of the early years interventions are delivered through or within the primary care sector. The findings indicate that targeted CBT is effective in preventing depression in adults when delivered in primary care settings by primary care staff or mental health professionals. The evidence for prevention interventions for children and young people is less strong, indicating that intervention delivery needs to extend beyond the primary care setting through follow-up sessions.

Two reviews on social prescribing were identified in the search, however, these did not meet the inclusion criteria for the current study. Social prescribing provides an excellent framework for coordinating existing community-based services and programmes to support the mental health and wellbeing of community members. Therefore, investment in high-quality evaluation of the impact of social prescribing in Ireland is needed, to ensure that practice is supported by research. Social prescribing interventions have been evaluated to date using mainly a pre-post study design without a control group (Pescheny et al., 2020; Vidovic et al., 2021). These studies illustrate the potential of social prescribing in improving social and subjective wellbeing, reducing health care service use and building community capacity, and these findings need to

be replicated in high-quality controlled studies in the Irish context. Following the evaluation guidelines for social prescribing interventions outlined by the Health Service Executive (HSE, n.d.), will ensure that outcomes are measured systematically across studies.

Awareness raising

Of the mental health awareness and stigma reduction interventions, Mental Health First Aid (MHFA) had the greatest amount of research evidence to support its effectiveness. Mental health awareness and stigma-reduction interventions were found to improve mental health related knowledge, however, their impact on attitudes and behaviours was less strong. Furthermore, the impact of mental health awareness interventions on the mental health status of community members is unclear.

The identified interventions all focused on identifying symptoms of mental health disorders and effective treatment approaches, and there was a lack of review level evidence concerning the impact of public awareness raising campaigns focusing on positive mental health. This is likely to be influenced by the challenges of evaluating the effectiveness of population wide campaigns using traditional randomised controlled trials (Sanson-Fisher et al., 2007). Nevertheless, interventions such as the HSE Little Things campaign (<https://www2.hse.ie/services/campaigns/littlethings/behind-the-campaign.html>), have an important role in raising public awareness of how to support positive mental health and thus have the potential for a population wide impact on mental health and wellbeing.

Strengths and limitations of the review

This study employed a systematic rapid evidence assessment approach to provide a robust review of the current evidence on the effectiveness of mental health promotion and primary prevention interventions across the lifecourse. However, there are a number of limitations that should be noted. Due to the limited timeframe and the large research area covered in this study, the search was limited to systematic reviews and meta-analyses of controlled trials. Although this search strategy allows for the most robust evidence to be identified, it is important to acknowledge that many promising and innovative interventions that do not yet have a robust evidence-base of their effectiveness (i.e., from controlled studies) will have been excluded. Furthermore, by focusing on review findings without also doing a search of primary studies, findings from most recent effectiveness trials may have been overlooked.

Much of the evidence included in this review has focused on individual-level interventions with few studies examining the impact of social change interventions or more integrated approaches operating at a cross-sectoral policy level. Such multifaceted and more upstream approaches, which are critical for addressing the social determinants of population mental health, do not lend themselves to traditional experimental evaluation approaches and are, therefore, less likely to be captured in a traditional evidence review approach. Notwithstanding these limitations, this review has identified high-quality interventions across the lifecourse that have produced consistent evidence of their effectiveness across multiple robust trials in a diverse range of settings and countries.

Implications for policy and practice

The findings from this review indicate that mental health promotion interventions implemented in a range of everyday settings can lead to positive mental health and wellbeing outcomes for population groups across the lifecourse. However, as relatively few of the interventions have been scaled up to meet population needs at a country level, evidence for their feasibility, effectiveness and sustainability in the Irish context will need to be strengthened.

The findings show that the strongest evidence was found for early years, parenting and school-based interventions, building on the already extensive evidence base on the effectiveness of these interventions, including in Ireland. Universal provision is supported by the review findings together with the provision of more targeted approaches proportionate to need. Mental health promotion and prevention interventions for children and families have the potential to produce long-term positive mental health and social outcomes across the entire lifecourse and can also contribute to reducing inequities in developmental outcomes. The effective implementation and scaling-up of these evidence-based early years, family support and parenting programmes in standard service delivery in the Irish context, both in terms of reach and intensity, warrants further investigation. Furthermore, the impact of these programmes at a population level needs to be considered in the context of wider policy initiatives addressing the structural determinants of poverty and child health and social inequities.

A substantive body of evidence from high quality reviews indicates that social and emotional skills-based programmes, when implemented effectively in preschool and schools, produce significant positive effects for young people's mental health and wellbeing, positive development and educational success. Implementation quality is identified as a key factor in

the effectiveness of social and emotional learning programmes, as is their successful integration into the core mission and ecology of the school and community in which they are implemented. The review findings support a policy and practice focus on embedding comprehensive skill-based programmes delivered by teachers within a whole school approach, employing universal and targeted approaches, involving staff, students and parents, the wider school environment and supported by local community partnerships.

The quality of evidence on the effectiveness of community-based interventions was generally lower. However, the lack of evidence does not necessarily indicate the absence of effective interventions but may instead reflect the absence of robust evaluation studies. Given the potential reach and impact of community development approaches for marginalised and vulnerable populations, further investment is needed in improving the quality of evaluation studies for community-based interventions tailored to the needs of diverse groups of young people, adults and older people.

Some intervention approaches, such as mindfulness and cognitive behavioural therapy, were implemented successfully across the lifecourse and in various settings. The potential of scaling-up these approaches, including through online delivery, is indicated by the review findings, in terms of extending the reach and impact of both universal and targeted programmes. However, a focus on the implementation requirements for successful delivery of online interventions is needed to ensure their optimal delivery and to reduce attrition rates, especially for more vulnerable groups.

The review findings demonstrate that a wide range of interventions can be successfully implemented in workplaces to promote employee mental health and wellbeing and reduce mental health related stigma. However, the bulk of the current evidence relates to individual-level approaches and further evidence is needed on the effectiveness of organisational interventions and on combined approaches that can lead to both individual-level and work-related outcomes. The effective implementation and mainstreaming of these approaches across a diverse range of Irish workplace settings will need to be supported by good quality evaluation studies.

This review highlighted a number of gaps in the current evidence base. The current evidence on mental health promotion for older people, primary care interventions and public awareness raising strategies is quite limited and there is a need to expand the evidence to include a broader

range of intervention approaches and more robust evaluations that can inform best practice in these areas. The findings also highlight the need for additional evidence on the most effective intervention approaches for specific population groups, such as minority or vulnerable populations, including sexual and gender minorities, ethnic minorities, and individuals who experience adverse childhood and life experiences, poverty, homelessness, social marginalisation and other vulnerabilities. Further evidence is, therefore, needed on the equity impact of intervention approaches for specific population groups.

Much of the evidence included in this evidence synthesis focused on individual-level interventions with few studies included examining the impact of social change interventions or more integrated intersectoral policy approaches, due to the lack of available findings from controlled studies. The evaluation of more complex upstream approaches, that do not lend themselves to traditional experimental evaluation approaches, will need to be supported in order to strengthen knowledge generation and translation concerning their impact on the wider determinants of population mental health and wellbeing. A social determinants of mental health approach advocates action across multiple sectors and levels. As such, mental health promotion interventions will need to address the opportunities and challenges experienced by individuals and families living in different socio-economic, cultural and community contexts. To ensure sustainable health, educational and social outcomes, universal and targeted mental health promotion interventions will need to be delivered in the context of supportive intersectoral policies and practices that address the structural drivers of population mental health, wellbeing and equity.

Drawing on the current evidence, there is a strong case for a sustained policy focus on the delivery of high-quality mental health promotion interventions across the lifecourse and key settings in the Irish context. The effective implementation and mainstreaming of these evidence-based approaches across a range of settings requires supportive implementation structures and capacity development, including ongoing training and monitoring for quality assurance. Supportive policies, implementation structures and practices will be critical to scaling-up the most effective approaches and ensuring the quality of implementation necessary for positive outcomes to be achieved and sustained. Improving the quality of the evidence base, especially for more upstream, integrated social change interventions, will play a critical role in advancing the knowledge needed by policymakers and practitioners in scaling-up effective approaches. More comprehensive evaluation studies, including study designs that assess

implementation processes and outcomes, together with long-term follow-up and the use of cost-effectiveness and equity analysis, will strengthen the evidence base for advancing policy and the mainstreaming of effective mental health promotion practice.

CONCLUSIONS

The synthesis of findings from this review of 111 meta-analyses and 57 systematic reviews shows that there is evidence from well conducted studies that high quality interventions can lead to positive mental health and wellbeing outcomes for individuals and population groups across the lifecourse and in diverse settings. There is well established and consistent evidence concerning the positive impact of interventions focusing on early years, family support, parenting and school-based programmes, including for children and families experiencing disadvantage. Although the current evidence is less robust, the review findings are supportive of the potential of a range of well-designed workplace and community-based interventions, including those delivered digitally and in primary care settings. It is clear from these findings that mental health promotion and primary prevention interventions, implemented across diverse health, education, employment and community sectors, have the potential to promote population mental health and wellbeing and lead to range of positive health and social outcomes. Supporting the delivery of these evidence-informed practices will be critical to their effective implementation, as will developing the evidence base on their implementation, outcomes, cost-effectiveness and equity impact in the Irish context. Contextualising and translating the evidence into effective actions tailored to the needs of priority population groups across diverse cultural and socio-economic contexts in Ireland is a critical area for further development. Improving the quality of evaluation studies for community-based and cross-sectoral social change level interventions is needed in order that knowledge from good quality research can inform how best practices can be developed, sustained and mainstreamed at a scale and scope that will make a critical difference at a population level. The implementation of evidence-based mental health promotion interventions will need to be anchored and advanced within the broader context of supportive intersectoral policies and actions that address health and social inequities in order to ensure that the conditions and environments that create and support good mental health and wellbeing are accessible to all.

REFERENCES

References for the main report

- Adi, Y., Killoran, A., Janmohamed, K. & Stewart-Brown, S. (2007). *Systematic review of the effectiveness of interventions to promote mental wellbeing in children in primary education, Report 1: Universal Approaches (Non-violence Related Outcomes)*. London: National Institute for Health and Clinical Excellence.
- Bambra, C., Riordan, R., Ford, J., Mathews, F. (2020). The COVID-19 pandemic and health inequalities. *Journal of Epidemiology and Community Health*, 74, 964-968.
- Barlow, J., Bergman, H., Kornør, H., Wei, Y., & Bennett, C. (2016). Group-based parent training programmes for improving emotional and behavioural adjustment in young children. *The Cochrane Database of Systematic Reviews*, 2016(8), CD003680. <https://doi.org/10.1002/14651858.CD003680.pub3>
- Barnett, W.S. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. *The Future of Children*, 5, 25-50.
- Barry, M. M. (2001). Promoting positive mental health: theoretical frameworks for practice. *International Journal of Mental Health Promotion*, 3(1), 25-43.
- Barry, M.M. (2009). Addressing the determinants of positive mental health: concepts, evidence and practice. *International Journal of Mental Health Promotion*, 11(3) 4-17.
- Barry, M. M., Kuosmanen, T., Clarke, A. M. (2017a). *Implementing effective interventions for promoting adolescents' mental health: A review of the evidence in the European region*. A report produced for the WHO Regional Office for Europe by the World Health Organization Collaborating Centre for Health Promotion Research, National University of Ireland Galway.
- Barry, M. M., Clarke, A. M. & Dowling, K. (2017b). Promoting social and emotional well-being in schools. *Health Education*, 117(5), 434-451. <https://doi.org/10.1108/HE-11-2016-0057>

- Barry, M.M., Clarke, A.M., Petersen, I., Jenkins, R. (2019). *Implementing mental health promotion (2nd edition)*. Cham, Switzerland: Springer Nature.
<https://www.springer.com/in/book/9783030234546>
- Baumel, A., & Faber, K. (2018). Evaluating Triple P Online: A digital parent training program for child behavior problems [Review of the software Triple p online, by M. Sanders]. *Cognitive and Behavioral Practice*, 25(4), 538–543. <https://doi.org/10.1016/j.cbpra.2017.10.001>
- Bhui, K. S., Dinos, S., Stansfeld, S. A., & White, P. D. (2012). A synthesis of the evidence for managing stress at work: A review of the reviews reporting on anxiety, depression, and absenteeism. *Journal of Environmental and Public Health*, 2012.
<https://doi.org/10.1155/2012/515874>
- Bierman, K. L., Mathis, E. T., & Domitrovich, C. E. (2018). Serving the needs of young children with social, emotional, and behavioral needs: a commentary. *School Mental Health*, 10(3), 254-263.
- Bloom, D.E., Cafiero, E.T., Jané-Llopis, E., Abrahams-Gessel, S., Bloom, L.R., Fathima, S., Feigl, A.B., Gaziano, T., Mowafi, M., Pandya, A., Prettnner, K., Rosenberg, L., Seligman, B., Stein, A., & Weinstein, C. (2011). *The global economic burden of non-communicable diseases*. Geneva: World Economic Forum.
- Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., Perez-Escamilla, R., Rao, N., Ip, P., Fernald, L. C. H., MacMillan, H., Hanson, M., Wachs, T. D., Yao, H., Yoshikawa, H., Cerezo, A., Leckman, J. F., Bhutta, Z. A., & Early Childhood Development Interventions Review Group, Lancet Early Childhood Development Series Steering Committee. (2017). Advancing early childhood development: From science to scale 2: Nurturing care: Promoting early childhood development. *The Lancet*, 389(10064), 91–102. [https://doi.org/10.1016/S0140-6736\(16\)31390-3](https://doi.org/10.1016/S0140-6736(16)31390-3)
- Calhoun, B., Williams, J., Greenberg, M., Domitrovich, C., Russell, M. A., & Fishbein, D. H. (2020). Social emotional learning program boosts early social and behavioral skills in

- low-income urban children. *Frontiers in Psychology*, 11, 561196.
<https://doi.org/10.3389/fpsyg.2020.561196>
- CASEL. (2015). *Guide: Effective social and emotional learning programs - Middle and high school edition*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.
- Casillas, K. L., Fauchier, A., Derkash, B. T., & Garrido, E. F. (2016). Implementation of evidence-based home visiting programs aimed at reducing child maltreatment: A meta-analytic review. *Child Abuse & Neglect*, 53, 64–80.
<https://doi.org/10.1016/j.chiabu.2015.10.009>
- Castro, C., Szeto, A., Dobson, K., Knaak, S., Sachs, R., Luong, R., ..., Krupa, T. (2015). *Opening minds at the workplace: Interim results of the mental health promotion and anti-stigma intervention – The Working Mind*. Mental Health Commission of Canada.
- Cénat, J. M., Blais-Rochette, C., Kokou-Kpolou, C. K., Noorishad, P.-G., Mukunzi, J. N., McIntee, S.-E., Dalexis, R. D., Goulet, M.-A., & Labelle, R. P. (2021). Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. *Psychiatry Research*, 295, 113599.
<https://doi.org/10.1016/j.psychres.2020.113599>
- Child and Family Research Centre (2010). *Big Brothers Big Sisters (BBBS) of Ireland: Evaluation study. Report 3: Summary Report*. Galway, Ireland: Child and Family Research Centre, National University of Ireland, Galway.
- Clarke, Morreale, Field, Hussein & Barry (2015). *What works in enhancing social and emotional skills development during childhood and adolescence?* Report for the Early Intervention Foundation & the UK Cabinet Office. WHO Collaborating Centre for Health Promotion Research, National University of Ireland Galway.
<https://aran.library.nuigalway.ie/handle/10379/4981>
- Clarke, A., Sorgenfrei, M., Mulcahy, J., Davie, P., Friedrich, C. & McBride, T. (2021). *Adolescent mental health: A systematic review on the effectiveness of school-based interventions*. Early Intervention Foundation.

- Cohen-Mansfield, J., & Perach, R. (2015). Interventions for alleviating loneliness among older persons: A critical review. *American Journal of Health Promotion*, 29(3), e109-e125. doi:10.4278/ajhp.130418-LIT-182
- Dalziel, K., & Segal L. (2012). Home visiting programmes for the prevention of child maltreatment: cost-effectiveness of 33 programmes. *Archives of Disease in Childhood*, 97, 787-798.
- Daniels, K., Gedikli, C., Watson, D., Semkina, A., & Vaughn, O. (2017). Job design, employment practices and well-being: a systematic review of intervention studies. *Ergonomics*, 60(9), 1177–1196. <https://doi.org/10.1080/00140139.2017.1303085>
- Davies, E. B., Beever, E., & Glazebrook, C. (2018). A pilot randomised controlled study of the mental health first aid eLearning course with UK medical students. *BMC medical education*, 18(1), 45. <https://doi.org/10.1186/s12909-018-1154-x>
- Department of Health. (2021). *Healthy Ireland Strategic Action Plan 2012-2025: Building on the first seven years of implementation*. Dublin: Government of Ireland.
- Department of Health. (2020). *Sharing the Vision: A mental health policy for everyone*. Dublin: Government of Ireland.
- Dobson, K. S., Szeto, A., & Knaak, S. (2019). The Working Mind: A Meta-Analysis of a Workplace Mental Health and Stigma Reduction Program | L'esprit au travail: une méta-analyse d'un programme de santé mentale en milieu de travail et de réduction de la stigmatisation. *Canadian Journal of Psychiatry*, 64(1_suppl), 39S-47S. <https://doi.org/10.1177/0706743719842559>
- Dowling, K., Simpkin, A. J., & Barry, M. M. (2019). A Cluster Randomized-Controlled Trial of the MindOut Social and Emotional Learning Program for Disadvantaged Post-Primary School Students. *Journal of Youth and Adolescence*, 48(7), 1245–1263. <https://doi.org/10.1007/s10964-019-00987-3>
- Dowling, K., & Barry, M. M. (2020a). Evaluating the implementation quality of a social and emotional learning program: a mixed methods approach. *International Journal of*

Environmental Research and Public Health, 17(9), 3249.

<https://doi.org/10.3390/ijerph17093249>

Dowling, K., & Barry, M. M. (2020b). The effects of implementation quality of a school-based social and emotional well-being program on students' outcomes. *European Journal of Investigation in Health, Psychology and Education*, 10(2), 595–614.

<https://doi.org/10.3390/ejihpe10020044>

Doyle, O., Hegarty, M. Owens, C. (2018). Population-based parenting programme to reduce the prevalence of child socio-emotional and behavioural problems: differences-in-differences study. *Prevention Science*, 19(6), 772-81.

Durlak, J. A., Weissberg, R. P., Dymneci, A. B., Taylor, R. D. & Schellinger, K. B. (2011), The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405-432.

Filene, J. H., Kaminski, J. W., Valle, L. A., & Cachat, P. (2013). Components associated with home visiting program outcomes: a meta-analysis. *Pediatrics*, 132(Suppl 2), S100–S109. <https://doi.org/10.1542/peds.2013-1021H>

Fitzpatrick, P., Molloy, B., & Johnson, Z. (1997). Community mothers' programme: extension to the travelling community in Ireland. *Journal of Epidemiology and Community Health*, 51(3), 299–303. <https://doi.org/10.1136/jech.51.3.299>

Friedli, L. (2009). *Mental health resilience and inequalities*. Copenhagen: WHO Regional Office for Europe

Furlong, M., McGilloway, S., Bywater, T., Hutchings, J., Smith, S. M., & Donnelly, M. (2012). Behavioural and cognitive-behavioural group-based parenting programmes for early-onset conduct problems in children aged 3 to 12 years. *The Cochrane Database of Systematic Reviews*, 2, CD008225.

<https://doi.org/10.1002/14651858.CD008225.pub2>

Griffiths, K. M., Farrer, L., & Christensen, H. (2010). The efficacy of internet interventions for depression and anxiety disorders: a review of randomised controlled trials. *The*

Medical journal of Australia, 192(S11), S4–S11. <https://doi.org/10.5694/j.1326-5377.2010.tb03685.x>

- Grossman, J. B., & Rhodes, J. E. (2002). The test of time: Predictors and effects of duration in youth mentoring relationships. *American Journal of Community Psychology*, 30(2), 199-219.
- Grossman, J. B., & Tierney, J. P. (1998). Does mentoring work? An impact study of the Big Brothers Big Sisters program. *Evaluation Review*, 22(3), 403-426.
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, 57(1), 35–43. [https://doi.org/https://doi.org/10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7)
- Hanisch, S. E., Twomey, C. D., Szeto, A. C. H., Birner, U. W., Nowak, D., & Sabariego, C. (2016). The effectiveness of interventions targeting the stigma of mental illness at the workplace: A systematic review. *BMC Psychiatry*, 16(1). <https://doi.org/10.1186/s12888-015-0706-4>
- Hart, L. M., Morgan, A. J., Rossetto, A., Kelly, C. M., Mackinnon, A., & Jorm, A. F. (2018). Helping adolescents to better support their peers with a mental health problem: A cluster-randomised crossover trial of teen Mental Health First Aid. *The Australian and New Zealand Journal of Psychiatry*, 52(7), 638–651. <https://doi.org/10.1177/0004867417753552>
- Health Service Executive (n.d.). *Building capacity for the evaluation of social prescribing*. <https://www.hse.ie/eng/services/list/4/mental-health-services/connecting-for-life/publications/social-prescribing.pdf>
- Herrman, H., Saxena, S. & Moodie, R. (eds.) (2005). *Promoting mental health: Concepts, emerging evidence, practice*. A report of the World Health Organization, Department of Mental Health and Substance Abuse in collaboration with the Victorian Health Promotion Foundation and University of Melbourne. Geneva, Switzerland: World Health Organization.

- Hogg, B., Medina, J. C., Gardoki-Souto, I., Serbanescu, I., Moreno-Alcázar, A., Cerga-Pashoja, A., ... Amann, B. L. (2021). Workplace interventions to reduce depression and anxiety in small and medium-sized enterprises: A systematic review. *Journal of Affective Disorders*, 290, 378–386. <https://doi.org/10.1016/j.jad.2021.04.071>
- International Union for Health Promotion and Education (2021). *Position statement on critical actions for mental health promotion*. Paris: IUHPE.
https://www.iuhpe.org/images/IUHPE/Advocacy/IUHPE_Mental-Health_PositionStatement.pdf
- Jané-Llopis, E., Barry, M. M., Hosman, C., Patel, V. (2005). Mental health promotion works: a review. *Promotion and Education*, Suppl 2, 9-25.
- Joanna Briggs Institute (2017). *The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews*. <http://joannabriggs.org/research/critical-appraisal-tools.html>
- Johnson, Z., Howell, F., & Molloy, B. (1993). Community Mothers Programme: randomised controlled trial of non-professional intervention in parenting. *British Medical Journal*, 306(6890), 1449-1452.
- Johnson, Z., Molloy, B., Scallan, E., Fitzpatrick, P., Rooney, B., Keegan, T., & Byrne, P. (2000). Community Mothers Programme -- seven year follow-up of a randomized controlled trial of non-professional intervention in parenting. *Journal of Public Health Medicine*, 22(3), 337–342.
- Jones, S. M. & Bouffard, S. M. (2012). Social and emotional learning in schools: from programs to strategies: social policy report. *Society for Research in Child Development*, 26(4), 3-22.
- Kendrick, D., Barlow, J., Hampshire, A., Stewart-Brown, S., & Polnay, L. (2008). Parenting interventions and the prevention of unintentional injuries in childhood: systematic review and meta-analysis. *Child: Care, Health and Development*, 34(5), 682–695.
<https://doi.org/10.1111/j.1365-2214.2008.00849.x>

- Khosravi, P., & Ghapanchi, A. H. (2016). Investigating the effectiveness of technologies applied to assist seniors: A systematic literature review. *International Journal of Medical Informatics*, 85(1), 17-26.
- Khosravi, P., Rezvani_A., & Wiewiora, A. (2016). The impact of technology on older adults' social isolation. *Computers in Human Behavior*, 63, 594-603.
<https://doi.org/10.1016/j.chb.2016.05.092>
- Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research*, 78(6), 519–528.
<https://doi.org/https://doi.org/10.1016/j.jpsychores.2015.03.009>
- Knight, C., Patterson, M., & Dawson, J. (2019). Work engagement interventions can be effective: a systematic review. *European Journal of Work and Organizational Psychology*, 28(3), 348–372. <https://doi.org/10.1080/1359432X.2019.1588887>
- Kelly, B.D. (2020). Impact of Covid-19 on mental health in Ireland: evidence to date. *Irish Medical Journal*, 113(10), 2014.
- Knapp, M., McDaid, D., Parsonage, M. (2011). *Mental health promotion and prevention: The economic case*. London: Personal Social Services Research Unit, London School of Economics and Political Science.
- Kuosmanen, T., Clarke, A. M. & Barry, M. M. (2019). Promoting adolescents' mental health and wellbeing: evidence synthesis. *Journal of Public Mental Health*, 18(1), 73-83. <https://doi.org/10.1108/JPMH-07-2018-0036>
- Le, LK-D, Esturas, A. C., Mihalopoulos, C., Chiotelis, O., Bucholc, J., Chatterton, M. L., Engel, L. (2021). Cost-effectiveness evidence of mental health prevention and promotion interventions: A systematic review of economic evaluations. *PLoS Medicine*, 18(5): e1003606. <https://doi.org/10.1371/journal.pmed.1003606>

- Mentinga, A. T. A., Orobio de Castro, B., & Matthys, W. (2013). Effectiveness of the Incredible Years parent training to modify disruptive and prosocial child behaviour: a metanalytical review. *Clinical Psychology Review*, 33(8), 901-913.
- Meyer, B., Berger, T., Caspar, F., Beevers, C. G., Andersson, G., & Weiss, M. (2009). Effectiveness of a novel integrative online treatment for depression (Deprexis): randomized controlled trial. *Journal of Medical Internet Research*, 11(2), e15.
- Morgan, A. J., Fischer, J. A. A., Hart, L. M., Kelly, C. M., Kitchner, B. A., Reavley, M. J., ... Jorm, A. H. (2019). Does mental health first aid training improve the mental health of aid recipients? The training for parents of teenagers randomised controlled trial. *BMC Psychiatry*, 19, 99. <https://doi.org/10.1186/s12888-019-2085-8>
- Morris, M. E., Adair, B., Ozanne, E., Kurowski, W., Miller, K. J., Pearce, A. J., . . . Said, C. M. (2014). Smart technologies to enhance social connectedness in older people who live at home. *Australasian Journal on Ageing*, 33(3), 142-152.
doi:10.1111/ajag.12154
- Morrison, J., Pikhart, H., Ruiz, M., & Goldblatt, P. (2014). Systematic review of parenting interventions in European countries aiming to reduce social inequalities in children's health and development. *BMC Public Health*, 14, 1040.
- Mrazek, P. J., Haggerty, R. J. (Eds.) (1994). *Reducing risks for mental disorders: frontiers for preventive intervention research*. Washington, DC: National Academy Press.
- Olds, D. L., Eckenrode, J., Henderson, C. R., Jr, Kitzman, H., Powers, J., Cole, R., Sidora, K., Morris, P., Pettitt, L. M., & Luckey, D. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial. *JAMA*, 278(8), 637–643.
- Park, S-H., Han, K. S., & Kang, C.-B. (2014). Effects of exercise programs on depressive symptoms, quality of life, and self-esteem in older people: a systematic review of randomized controlled trials. *Applied Nursing Research*, 27(4), 219-226.
doi:10.1016/j.apnr.2014.01.004

- Pascoe, M., Bailey, A. P., Craike, M., Carter, T., Patten, R., Stepto, N., & Parker, A. (2020). Physical activity and exercise in youth mental health promotion: a scoping review. *BMJ Open Sport & Exercise Medicine*, 6(1), e000677. <https://doi.org/10.1136/bmjsem-2019-000677>
- Peacock, S., Konrad, S., Watson, E., Nickel, D., & Muhajarine, N. (2013). Effectiveness of home visiting programs on child outcomes: a systematic review. *BMC Public Health*, 13, 17. <https://doi.org/10.1186/1471-2458-13-17>
- Petersen, I., Evans-Lacko S., Semrau, M., Barry, M.M., Chisholm, D., Gronholm, P., Egbe, C.O., Thornicroft, G. (2015). Population and community platform interventions (pp183-200). In V. Patel, D. Chisholm, T. Dua, R. Laxminarayan, M.E. Medina-Mora (Eds.), *Mental, neurological, and substance use disorders. Disease Control Priorities 3rd Edition*. Washington, DC: International Bank for Reconstruction and Development/The World Bank.
- Rickwood, D.J. and Thomas, K.A. (2019). *Mental wellbeing interventions: An evidence check rapid review brokered by the Sax Institute* (www.saxinstitute.org.au) for VicHealth, Melbourne, Australia.
- Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., Rasoulpoor, S., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health*, 16(1), 57. <https://doi.org/10.1186/s12992-020-00589-w>
- Sanders, M. R., Kirby, J. N., Tellegen, C. L., & Day, J. J. (2014). The Triple P-Positive Parenting Program: a systematic review and meta-analysis of a multi-level system of parenting support. *Clinical Psychology Review*, 34(4), 337–357. <https://doi.org/10.1016/j.cpr.2014.04.003>
- Sanders, M. T., Welsh, J. A., Bierman, K. L., & Heinrichs, B. S. (2020). Promoting resilience: a preschool intervention enhances the adolescent adjustment of children exposed to early adversity. *School Psychology*, 35(5), 285–298. <https://doi.org/10.1037/spq0000406>

- Sanson-Fisher, R. W., Bonevski, B., Green, L. W., & D'Este, C. (2007). Limitations of the randomized controlled trial in evaluating population-based health interventions. *American Journal of Preventive Medicine*, 33(2), 155–161. <https://doi.org/10.1016/j.amepre.2007.04.007>
- Sher, L. (2020). The impact of the COVID-19 pandemic on suicide rates. *QJM: An International Journal of Medicine*, 113(10), 707–712. <https://doi.org/10.1093/qjmed/hcaa202>.
- Sheridan, A., & McElhinney, T. (2016). *Guidance document for the promotion of positive mental health and wellbeing*. Dublin: HSE.
- Silverman, P. R. (1986). *Widow-to-widow*. New York, NY: Springer.
- Sklad, M., Diekstra, R., De Ritter, M. & Ben, J. (2012), Effectiveness of school-based universal social, emotional, and behavioral programs: do they enhance students' development in the area of skill, behavior, and adjustment? *Psychology in the Schools*, 49(9), 892-909.
- Sweet, M. A., & Appelbaum, M. I. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development*, 75(5), 1435–1456. <https://doi.org/10.1111/j.1467-8624.2004.00750.x>
- Trickett, E. J., Beehler, S., Deutsch, C., Green, L. W., Hawe, P., McLeroy, K., Miller, R. L., Rapkin, B. D., Schensul, J. J., Schulz, A. J., & Trimble, J. E. (2011). Advancing the science of community-level interventions. *American Journal of Public Health*, 101(8), 1410–1419. <https://doi.org/10.2105/AJPH.2010.300113>
- United Nations (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*. Sustainable Development knowledge platform. New York: United Nations. <https://sustainabledevelopment.un.org/post2015/transformingourworld>
- Vachon, M. L., Lyall, W. A., Rodgers, J., Freedman-Letofsky, K., Freeman, S. J. (1980). A controlled study of self-help interventions for widows. *American Journal of Psychiatry*, 137(11), 1380-1384.

- Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, Behavior, and Immunity*, S0889159120309545. <https://doi.org/10.1016/j.bbi.2020.05.048>.
- Weare, K., & Nind, M. (2011). Mental health promotion and problem prevention in schools: what does the evidence say? *Health Promotion International*, 26(S1), 29-69.
- Whiteford, H.A., Ferrari, A.J Degenhardt, L., Feigin, V., Vos, T. (2015). Global burden of mental, neurological, and substance use disorders: An analysis from the Global Burden of Disease Study 2010. *PLoS One*, 10(2), e0116820.
- Williford, A., Boulton, A., Noland, B., Little, T. D., Kärnä, A., & Salmivalli, C. (2012). Effects of the KiVa anti-bullying program on adolescents' depression, anxiety, and perception of peers. *Journal of Abnormal Child Psychology*, 40(2), 289–300. <https://doi.org/10.1007/s10802-011-9551-1>
- World Health Organization (1986). *The Ottawa Charter for Health Promotion*. Geneva: World Health Organization.
- World Health Organization (2001). *Mental health: new understanding, new hope. The World Health Report*. Geneva: World Health Organization.
- World Health Organization (2013). *Investing in mental health evidence for action*. Geneva: World Health Organization.
- World Health Organization (2021). *Comprehensive mental health action plan 2021-2030*. Geneva: World Health Organization.
- World Health Organization & Calouste Gulbenkian Foundation (2014). *Social Determinants of Mental Health*. Geneva: World Health Organization.
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M. W., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55-64.

Zins, J. E., Weissberg, R. P., Wang, M. C. & Walberg, H. J. (Eds) (2004). *Building academic success through social and emotional learning: what does the research say?* New York, NY: Teachers College Press.

References for the reviewed studies

- Adina, J., Morawska, A., Mitchell, A. E., & McBryde, M. (2021). Effect of parenting interventions on perinatal depression and implications for infant developmental outcomes: a systematic review and meta-analysis. *Clinical Child and Family Psychology Review*. <https://doi.org/10.1007/s10567-021-00371-3>
- Ali-Saleh Darawshy, N., Gewirtz, A., & Marsalis, S. (2020). Psychological intervention and prevention programs for child and adolescent exposure to community violence: A systematic review. *Clinical Child and Family Psychology Review*, 23(3), 365–378. <https://doi.org/10.1007/s10567-020-00315-3>
- Alkhalwaldeh, J. M. A., Soh, K. L., Mukhtar, F. B. M., & Ooi, C. P. (2020). Effectiveness of stress management interventional programme on occupational stress for nurses: A systematic review. *Journal of Nursing Management*, 28(2), 209–220. <https://doi.org/10.1111/jonm.12938>
- Alves, A. R., Dias, R., Neiva, H. P., Marinho, D. A., Marques, M. C., Sousa, A. C., ... Loureiro, N. (2021). High-intensity interval training upon cognitive and psychological outcomes in youth: A systematic review. *International Journal of Environmental Research and Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105344>
- Andermo, S., Hallgren, M., Nguyen, T.-T.-D., Jonsson, S., Petersen, S., Friberg, M., ... Elinder, L. S. (2020). School-related physical activity interventions and mental health among children: a systematic review and meta-analysis. *Sports Medicine - Open*, 6(1). <https://doi.org/10.1186/s40798-020-00254-x>
- Baourda, V. C., Brouzos, A., Mavridis, D., Vassilopoulos, S. P., Vatkali, E., & Boumpouli, C. (2021). Group psychoeducation for anxiety symptoms in youth: Systematic review and meta-analysis. *Journal for Specialists in Group Work*. <https://doi.org/10.1080/01933922.2021.1950881>
- Bartlett, L., Martin, A., Neil, A. L., Memish, K., Otahal, P., Kilpatrick, M., & Sanderson, K. (2019). A systematic review and meta-analysis of workplace mindfulness training randomized controlled trials. *Journal of Occupational Health Psychology*, 24(1), 108–126. <https://doi.org/10.1037/ocp0000146>

- Beelmann, A., & Lösel, F. (2021). A comprehensive meta-analysis of randomized evaluations of the effect of child social skills training on antisocial development. *Journal of Developmental and Life-Course Criminology*, 7(1), 41–65.
<https://doi.org/10.1007/s40865-020-00142-8>
- Bellón, J. A., Conejo-Cerón, S., Cortés-Abela, C., Pena-Andreu, J. M., García-Rodríguez, A., & Moreno-Peral, P. (2019). Effectiveness of psychological and educational interventions for the prevention of depression in the workplace: A systematic review and meta-analysis. *Scandinavian Journal of Work, Environment and Health*, 45(4), 324–332.
<https://doi.org/10.5271/sjweh.3791>
- Berry, D. R., Hoerr, J. P., Cesko, S., Alayoubi, A., Carpio, K., Zirzow, H., ... Beaver, V. (2020). Does mindfulness training without explicit ethics-based instruction promote prosocial behaviors? A meta-analysis. *Personality and Social Psychology Bulletin*, 46(8), 1247–1269. <https://doi.org/10.1177/0146167219900418>
- Blewitt, C., O'Connor, A., Morris, H., May, T., Mousa, A., Bergmeier, H., ... Skouteris, H. (2019). A systematic review of targeted social and emotional learning interventions in early childhood education and care settings. *Early Child Development and Care*.
<https://doi.org/10.1080/03004430.2019.1702037>
- Blewitt, C., Fuller-Tyszkiewicz, M., Nolan, A., Bergmeier, H., Vicary, D., Huang, T., ... Skouteris, H. (2018). Social and emotional learning associated with universal curriculum-based interventions in early childhood education and care centers: a systematic review and meta-analysis. *JAMA Network Open*, 1(8), e185727.
<https://doi.org/10.1001/jamanetworkopen.2018.5727>
- Bourke, M., Patten, R. K., Dash, S., Pascoe, M., Craike, M., Firth, J., ... Parker, A. G. (2021). The effect of interventions that target multiple modifiable health behaviors on symptoms of anxiety and depression in young people: A meta-analysis of randomized controlled trials. *Journal of Adolescent Health*.
<https://doi.org/10.1016/j.jadohealth.2021.08.005>

- Burgdorf, V., Szabó, M., & Abbott, M. J. (2019). The effect of mindfulness interventions for parents on parenting stress and youth psychological outcomes: A systematic review and meta-analysis. *Frontiers in Psychology, 10*. <https://doi.org/10.3389/fpsyg.2019.01336>
- Caldwell, D. M., Davies, S. R., Hetrick, S. E., Palmer, J. C., Caro, P., López-López, J. A., ... Welton, N. J. (2019). School-based interventions to prevent anxiety and depression in children and young people: A systematic review and network meta-analysis. *The Lancet Psychiatry, 6*(12), 1011–1020. [https://doi.org/10.1016/S2215-0366\(19\)30403-1](https://doi.org/10.1016/S2215-0366(19)30403-1)
- Carolan, S., Harris, P. R., & Cavanagh, K. (2017). Improving employee well-being and effectiveness: Systematic review and meta-analysis of web-based psychological interventions delivered in the workplace. *Journal of Medical Internet Research, 19*(7). <https://doi.org/10.2196/jmir.7583>
- Carr, A., Hartnett, D., Brosnan, E., & Sharry, J. (2017). Parents Plus systemic, solution-focused parent training programs: Description, review of the evidence base, and meta-analysis. *Family Process, 56*(3), 652–668. <https://doi.org/http://dx.doi.org/10.1111/famp.12225>
- Carsley, D., Khoury, B., & Heath, N. L. (2018). Effectiveness of mindfulness interventions for mental health in schools: A comprehensive meta-analysis. *Mindfulness, 9*(3), 693–707. <https://doi.org/10.1007/s12671-017-0839-2>
- Carter, T., Bastounis, A., Guo, B., & Jane Morrell, C. (2019). The effectiveness of exercise-based interventions for preventing or treating postpartum depression: A systematic review and meta-analysis. *Archives of Women's Mental Health, 22*(1), 37–53. <https://doi.org/10.1007/s00737-018-0869-3>
- Carter, T., Pascoe, M., Bastounis, A., Morres, I. D., Callaghan, P., & Parker, A. G. (2021). The effect of physical activity on anxiety in children and young people: A systematic review and meta-analysis. *Journal of Affective Disorders, 285*, 10–21. <https://doi.org/10.1016/j.jad.2021.02.026>
- Chen, T.-L., Chang, S.-C., Huang, C.-Y., & Wang, H.-H. (2021). Effectiveness of mindfulness-based interventions on quality of life and menopausal symptoms in

- menopausal women: A meta-analysis. *Journal of Psychosomatic Research*, 147. <https://doi.org/10.1016/j.jpsychores.2021.110515>
- Chobe, S., Chobe, M., Metri, K., Patra, S. K., & Nagaratna, R. (2020). Impact of Yoga on cognition and mental health among elderly: A systematic review. *Complementary Therapies in Medicine*, 52, 102421. <https://doi.org/10.1016/j.ctim.2020.102421>
- Claro, A., & Perelmiter, T. (2021). The effects of mentoring programs on emotional well-being in youth: A meta-analysis. *Contemporary School Psychology*. <https://doi.org/10.1007/s40688-021-00377-2>
- Coll-Planas, L., Nyqvist, F., Puig, T., Urrútia, G., Solà, I., & Monteserín, R. (2017). Social capital interventions targeting older people and their impact on health: A systematic review. *Journal of Epidemiology and Community Health*, 71(7), 663–672. <https://doi.org/10.1136/jech-2016-208131>
- Conejo-Cerón, S., Moreno-Peral, P., Rodríguez-Morejón, A., Motrico, E., Navas-Campaña, D., Rigabert, A., ... Bellón, J. Á. (2017). Effectiveness of psychological and educational interventions to prevent depression in primary care: A systematic review and meta-analysis. *Annals of Family Medicine*, 15(3), 262–271. <https://doi.org/10.1370/afm.2031>
- Corbally, L., & Wilkinson, M. (2021). the effect of mindfulness-based interventions on stress, depression and anxiety during the perinatal period in women without pre-existing stress, depressive or anxiety disorders: a systematic review and meta-analysis of controlled trials. *Mindfulness*, 12(10), 2357–2370. <https://doi.org/10.1007/s12671-021-01697-3>
- Corbijn van Willenswaard, K., Lynn, F., McNeill, J., McQueen, K., Dennis, C.-L., Lobel, M., & Alderdice, F. (2017). Music interventions to reduce stress and anxiety in pregnancy: A systematic review and meta-analysis. *BMC Psychiatry*, 17. <https://doi.org/10.1186/s12888-017-1432-x>
- Corcoran, R. P., Cheung, A. C. K., Kim, E., & Xie, C. (2018). Effective universal school-based social and emotional learning programs for improving academic achievement: A systematic review and meta-analysis of 50 years of research. *Educational Research Review*, 25, 56–72. <https://doi.org/10.1016/j.edurev.2017.12.001>

- Davaasambu, S., Hauwadhanasuk, T., Matsuo, H., & Szatmari, P. (2020). Effects of interventions to reduce adolescent depression in low- and middle-income countries: A systematic review and meta-analysis. *Journal of Psychiatric Research*, 123, 201–215. <https://doi.org/10.1016/j.jpsychires.2020.01.020>
- de Diego-Cordero, R., Lopez-Zurron, M. P., Vargas-Martínez, A. M., Lucchetti, G., & Vega-Escañó, J. (2021). The effectiveness of spiritual interventions in the workplace for work-related health outcomes: A systematic review and meta-analysis. *Journal of Nursing Management*. <https://doi.org/10.1111/jonm.13315>
- de Mooij, B., Fekkes, M., Scholte, R. H. J., & Overbeek, G. (2020). Effective components of social skills training programs for children and adolescents in nonclinical samples: A multilevel meta-analysis. *Clinical Child and Family Psychology Review*, 23(2), 250–264. <https://doi.org/10.1007/s10567-019-00308-x>
- Deady, M., Choi, I., Calvo, R. A., Glozier, N., Christensen, H., & Harvey, S. B. (2017). eHealth interventions for the prevention of depression and anxiety in the general population: A systematic review and meta-analysis. *BMC Psychiatry*, 17. <https://doi.org/10.1186/s12888-017-1473-1>
- Dhillon, A., Sparkes, E., & Duarte, R. V. (2017). Mindfulness-based interventions during pregnancy: A systematic review and meta-analysis. *Mindfulness*, 8(6), 1421–1437. <https://doi.org/10.1007/s12671-017-0726-x>
- Donald, J. N., Bradshaw, E. L., Ryan, R. M., Basarkod, G., Ciarrochi, J., Duineveld, J. J., ... Sahdra, B. K. (2020). Mindfulness and its association with varied types of motivation: A systematic review and meta-analysis using self-determination theory. *Personality and Social Psychology Bulletin*, 46(7), 1121–1138. <https://doi.org/10.1177/0146167219896136>
- Dray, J., Bowman, J., Campbell, E., Freund, M., Wolfenden, L., Hodder, R. K., ... Wiggers, J. (2017). Systematic review of universal resilience-focused interventions targeting child and adolescent mental health in the school setting. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(10), 813–824. <https://doi.org/10.1016/j.jaac.2017.07.780>

- Dunning, D. L., Griffiths, K., Kuyken, W., Crane, C., Foulkes, L., Parker, J., & Dalgleish, T. (2019). Research Review: The effects of mindfulness-based interventions on cognition and mental health in children and adolescents – a meta-analysis of randomized controlled trials. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 60(3), 244–258. <https://doi.org/10.1111/jcpp.12980>
- Evans, K., Morrell, C. J., & Spiby, H. (2018). Systematic review and meta-analysis of non-pharmacological interventions to reduce the symptoms of mild to moderate anxiety in pregnant women. *Journal of Advanced Nursing*, 74(2), 289–309. <https://doi.org/10.1111/jan.13456>
- Feiss, R., Dolinger, S. B., Merritt, M., Reiche, E., Martin, K., Yanes, J. A., ... Pangelinan, M. (2019). A systematic review and meta-analysis of school-based stress, anxiety, and depression prevention programs for adolescents. *Journal of Youth and Adolescence*, 48(9), 1668–1685. <https://doi.org/10.1007/s10964-019-01085-0>
- Fentz, H. N., & Trillingsgaard, T. (2017). Checking up on couples-a meta-analysis of the effect of assessment and feedback on marital functioning and individual mental health in couples. *Journal of Marital and Family Therapy*, 43(1), 31–50. <https://doi.org/10.1111/jmft.12185>
- Fenwick-Smith, A., Dahlberg, E. E., & Thompson, S. C. (2018). Systematic review of resilience-enhancing, universal, primary school-based mental health promotion programs. *BMC Psychology*, 6. Retrieved from <https://ezproxy.derby.ac.uk/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2018-33416-001&site=ehost-live>
- Flores, E. C., Fuhr, D. C., Bayer, A. M., Lescano, A. G., Thorogood, N., & Simms, V. (2018). Mental health impact of social capital interventions: A systematic review. *Social Psychiatry and Psychiatric Epidemiology: The International Journal for Research in Social and Genetic Epidemiology and Mental Health Services*, 53(2), 107–119. <https://doi.org/10.1007/s00127-017-1469-7>
- Flujas-Contreras, J. M., García-Palacios, A., & Gómez, I. (2019). Technology-based parenting interventions for children's physical and psychological health: A systematic

review and meta-analysis. *Psychological Medicine*, 49(11), 1787–1798.

<https://doi.org/10.1017/S0033291719000692>

Galante, J., Friedrich, C., Dawson, A. F., Modrego-Alarcón, M., Gebbing, P., Delgado-Suárez, I., ... Jones, P. B. (2021). Mindfulness-based programmes for mental health promotion in adults in nonclinical settings: A systematic review and meta-analysis of randomised controlled trials. *PLoS Medicine*, 18(1), e1003481.
<https://doi.org/10.1371/journal.pmed.1003481>

Garrido, S., Millington, C., Cheers, D., Boydell, K., Schubert, E., Meade, T., & Nguyen, Q. V. (2019). What works and what doesn't work? A systematic review of digital mental health interventions for depression and anxiety in young people. *Frontiers in Psychiatry*, 10. <https://doi.org/10.3389/fpsyt.2019.00759>

Gayed, A., Milligan-Saville, J. S., Nicholas, J., Bryan, B. T., LaMontagne, A. D., Milner, A., ... Harvey, S. B. (2018). Effectiveness of training workplace managers to understand and support the mental health needs of employees: A systematic review and meta-analysis. *Occupational and Environmental Medicine*, 75(6), 462–470.
<https://doi.org/10.1136/oemed-2017-104789>

Goldberg, J. M., Sklad, M., Elfrink, T. R., Schreurs, K. M. G., Bohlmeijer, E. T., & Clarke, A. M. (2019). Effectiveness of interventions adopting a whole school approach to enhancing social and emotional development: A meta-analysis. *European Journal of Psychology of Education*, 34(4), 755–782. <https://doi.org/10.1007/s10212-018-0406-9>

Golden, H. L., Vosper, J., Kingston, J., & Ellett, L. (2021). The impact of mindfulness-based programmes on self-compassion in nonclinical populations: A systematic review and meta-analysis. *Mindfulness*, 12(1), 29–52. <https://doi.org/10.1007/s12671-020-01501-8>

Goldstein, Z., Rosen, B., Howlett, A., Anderson, M., & Herman, D. (2020). Interventions for paternal perinatal depression: A systematic review. *Journal of Affective Disorders*, 265, 505–510. <https://doi.org/10.1016/j.jad.2019.12.029>

Gordon, B. R., McDowell, C. P., Lyons, M., & Herring, M. P. (2017). The Effects of Resistance Exercise Training on Anxiety: A Meta-Analysis and Meta-Regression

- Analysis of Randomized Controlled Trials. *Sports Medicine*, 47(12), 2521–2532.
<https://doi.org/10.1007/s40279-017-0769-0>
- Gritzka, S., Macintyre, T. E., Dörfel, D., Baker-Blanc, J. L., & Calogiuri, G. (2020). The effects of workplace nature-based interventions on the mental health and well-being of employees: A systematic review. *Frontiers in Psychiatry*, 11.
<https://doi.org/10.3389/fpsyt.2020.00323>
- Guo, P., Zhang, X., Liu, N., Wang, J., Chen, D., Sun, W., ... Zhang, W. (2021). Mind–body interventions on stress management in pregnant women: A systematic review and meta-analysis of randomized controlled trials. *Journal of Advanced Nursing*, 77(1), 125–146.
<https://doi.org/10.1111/jan.14588>
- Hansen, A., Broomfield, G., & Yap, M. B. H. (2019). A systematic review of technology-assisted parenting programs for mental health problems in youth aged 0–18 years: Applicability to underserved Australian communities. *Australian Journal of Psychology*, 71(4), 433–462. <https://doi.org/10.1111/ajpy.12250>
- Harris, M., Andrews, K., Gonzalez, A., Prime, H., & Atkinson, L. (2020). Technology-Assisted Parenting Interventions for Families Experiencing Social Disadvantage: a Meta-Analysis. *Prevention Science*, 21(5), 714–727. <https://doi.org/10.1007/s11121-020-01128-0>
- Hart, P. D., & Buck, D. J. (2019). The effect of resistance training on health-related quality of life in older adults: Systematic review and meta-analysis. *Health Promotion Perspectives*, 9(1), 1–12. <https://doi.org/10.15171/hpp.2019.01>
- Havinga, P. J., Maciejewski, D. F., Hartman, C. A., Hillegers, M. H. J., Schoevers, R. A., & Penninx, B. W. J. H. (2021). Prevention programmes for children of parents with a mood/anxiety disorder: Systematic review of existing programmes and meta-analysis of their efficacy. *The British Journal of Clinical Psychology*, 60(2), 212–251.
<https://doi.org/10.1111/bjc.12277>
- Higgen, S., Mueller, J. T., & Mösko, M. (2021). Review: Universal mental health interventions for young students in adverse environments – a systematic review of

- evaluated interventions. *Child and Adolescent Mental Health*.
<https://doi.org/10.1111/camh.12493>
- Huang, R., Yan, C., Tian, Y., Lei, B., Yang, D., Liu, D., & Lei, J. (2020). Effectiveness of peer support intervention on perinatal depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, 276, 788–796.
<https://doi.org/10.1016/j.jad.2020.06.048>
- Hudes, R., Rich, J. B., Troyer, A. K., Yusupov, I., & Vandermorris, S. (2019). The impact of memory-strategy training interventions on participant-reported outcomes in healthy older adults: A systematic review and meta-analysis. *Psychology and Aging*, 34(4), 587–597. <https://doi.org/10.1037/pag0000340>
- Hurt, L., Paranjothy, S., Lucas, P. J., Watson, D., Mann, M., Griffiths, L. J., ... Lingam, R. (2018). 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. *BMJ Open*, 8(2), e014899. <https://doi.org/10.1136/bmjopen-2016-014899>
- Ihara, Y., Kurosawa, T., Matsumoto, T., & Takizawa, R. (2021). The effectiveness of preventive group cognitive-behavioral interventions on enhancing work performance-related factors and mental health of workers: a systematic review. *Current Psychology*. <https://doi.org/10.1007/s12144-021-01562-5>
- Janssen, M., Heerkens, Y., Kuijer, W., Van Der Heijden, B., & Engels, J. (2018). Effects of mindfulness-based stress reduction on employees' mental health: A systematic review. *PLoS ONE*, 13(1). <https://doi.org/10.1371/journal.pone.0191332>
- Johnstone, K. M., Kemps, E., & Chen, J. (2018). A meta-analysis of universal school-based prevention programs for anxiety and depression in children. *Clinical Child and Family Psychology Review*, 21(4), 466–481. <https://doi.org/10.1007/s10567-018-0266-5>
- Jung, S.-E., Ha, D.-J., Park, J.-H., Lee, B., Kim, M.-S., Sim, K.-L., ... Kwon, C.-Y. (2021). The effectiveness and safety of mind-body modalities for mental health of nurses in hospital setting: A systematic review. *International Journal of Environmental Research and Public Health*, 18(16). <https://doi.org/10.3390/ijerph18168855>

- Kambara, K., & Kira, Y. (2021). School-based intervention for depressive symptoms in upper secondary education: A focused review and meta-analysis of the effect of CBT-based prevention. *Mental Health and Prevention*, 23. <https://doi.org/10.1016/j.mhp.2021.200206>
- Kang, M.-J., & Myung, S.-K. (2021). Effects of mindfulness-based interventions on mental health in nurses: A meta-analysis of randomized controlled trials. *Issues in Mental Health Nursing*, 43(10), 1-9. <https://doi.org/10.1080/01612840.2021.1949765>
- King, T., & Fazel, M. (2021). Examining the mental health outcomes of school-based peer-led interventions on young people: A scoping review of range and a systematic review of effectiveness. *PLoS ONE*, 16(4 April). <https://doi.org/10.1371/journal.pone.0249553>
- Klingbeil, D. A., & Renshaw, T. L. (2018). Mindfulness-based interventions for teachers: A meta-analysis of the emerging evidence base. *School Psychology Quarterly*, 33(4), 501–511. <https://doi.org/10.1037/spq0000291>
- Knight, C., Patterson, M., & Dawson, J. (2017). Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *Journal of Organizational Behavior*, 38(6), 792–812. <https://doi.org/10.1002/job.2167>
- Kodsi, A., Bullock, B., Kennedy, G. A., & Tirlea, L. (2021). Psychological interventions to improve sleep in young adults: A systematic review and meta-analysis of randomized controlled trials. *Behavioral Sleep Medicine*. <https://doi.org/10.1080/15402002.2021.1876062>
- Kotera, Y., & Van Gordon, W. (2021). Effects of Self-Compassion Training on Work-Related Well-Being: A Systematic Review. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.630798>
- Kuroda, N., Burkey, M. D., & Wissow, L. S. (2021). Discovering common elements of empirically supported self-help interventions for depression in primary care: A systematic review. *Journal of General Internal Medicine*, 36(4), 869–880. <https://doi.org/10.1007/s11606-020-06449-y>

- Kuster, A. T., Dalsbø, T. K., Luong Thanh, B. Y., Agarwal, A., Durand-Moreau, Q. V., & Kirkehei, I. (2017). Computer-based versus in-person interventions for preventing and reducing stress in workers. *Cochrane Database of Systematic Reviews*, 2017(8).
<https://doi.org/10.1002/14651858.CD011899.pub2>
- Lannes, A., Bui, E., Arnaud, C., Raynaud, J.-P., & Revet, A. (2021). Preventive interventions in offspring of parents with mental illness: A systematic review and meta-analysis of randomized controlled trials. *Psychological Medicine*, 51(14), 2321–2336.
<https://doi.org/10.1017/S0033291721003366>
- Lawrence, P. J., Rooke, S. M., & Creswell, C. (2017). Review: Prevention of anxiety among at-risk children and adolescents - a systematic review and meta-analysis. *Child & Adolescent Mental Health*, 22(3), 118–130. Retrieved from <http://10.0.4.87/camh.12226>
- Lee, R. L. T., Lane, S., Brown, G., Leung, C., Kwok, S. W. H., & Chan, S. W. C. (2020). Systematic review of the impact of unstructured play interventions to improve young children's physical, social, and emotional wellbeing. *Nursing and Health Sciences*, 22(2), 184–196. <https://doi.org/10.1111/nhs.12732>
- Leech, T., Dorstyn, D., Taylor, A., & Li, W. (2021). “Mental health apps for adolescents and young adults: A systematic review of randomised controlled trials”: Corrigendum. *Children and Youth Services Review*, 127.
<https://doi.org/10.1016/j.childyouth.2021.106073>
- Liang, M., Chen, Q., Guo, J., Mei, Z., Wang, J., Zhang, Y., ... Li, Y. (2021). Mental health first aid improves mental health literacy among college students: A meta-analysis. *Journal of American College Health*. <https://doi.org/10.1080/07448481.2021.1925286>
- Lim, Y. M., Kim, H., & Cha, Y. J. (2020). Effects of environmental modification on activities of daily living, social participation and quality of life in the older adults: A meta-analysis of randomized controlled trials. *Disability and Rehabilitation. Assistive Technology*, 15(2), 132–140. <https://doi.org/10.1080/17483107.2018.1533595>
- Lin, P.-Z., Xue, J.-M., Yang, B., Li, M., & Cao, F.-L. (2018). Effectiveness of self-help psychological interventions for treating and preventing postpartum depression: A meta-

- analysis. *Archives of Women's Mental Health*, 21(5), 491–503.
<https://doi.org/10.1007/s00737-018-0835-0>
- Lin, Y., Lin, R., Liu, W., & Wu, W. (2021). Effectiveness of horticultural therapy on physical functioning and psychological health outcomes for older adults: A systematic review and meta-analysis. *Journal of Clinical Nursing*. <https://doi.org/10.1111/jocn.16095>
- Ling, J., Zahry, N. R., & Liu, C.-C. (2021). Stress management interventions among socioeconomically disadvantaged parents: A meta-analysis and moderation analysis. *International Journal of Nursing Studies*, 120.
<https://doi.org/10.1016/j.ijnurstu.2021.103954>
- Loechner, J., Starman, K., Galuschka, K., Tamm, J., Schulte-Körne, G., Rubel, J., & Platt, B. (2018). Preventing depression in the offspring of parents with depression: A systematic review and meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 60, 1–14. <https://doi.org/10.1016/j.cpr.2017.11.009>
- Lomas, T., Medina, J. C., Ivztan, I., Rupprecht, S., & Eiroa-Orosa, F. J. (2019). Mindfulness-based interventions in the workplace: An inclusive systematic review and meta-analysis of their impact upon wellbeing. *Journal of Positive Psychology*, 14(5), 625–640.
<https://doi.org/10.1080/17439760.2018.1519588>
- Luo, L., Reichow, B., Snyder, P., Harrington, J., & Polignano, J. (2020). Systematic review and meta-analysis of classroom-wide social-emotional interventions for preschool children. *Topics in Early Childhood Special Education*.
<https://doi.org/10.1177/0271121420935579>
- Lupşa, D., Virga, D., Maricuţoiu, L. P., & Rusu, A. (2020). Increasing psychological capital: A pre-registered meta-analysis of controlled interventions. *Applied Psychology*, 69(4), 1506–1556. <https://doi.org/10.1111/apps.12219>
- Mackenzie, K., & Williams, C. (2018). Universal, school-based interventions to promote mental and emotional well-being: what is being done in the UK and does it work? A systematic review. *BMJ Open*, 8(9), e022560. <https://doi.org/10.1136/bmjopen-2018-022560>

- Malik, K., Ibrahim, M., Bernstein, A., Venkatesh, R. K., Rai, T., Chorpita, B., & Patel, V. (2021). Behavioral Activation as an “active ingredient” of interventions addressing depression and anxiety among young people: a systematic review and evidence synthesis. *BMC Psychology*, 9(1), 150. <https://doi.org/10.1186/s40359-021-00655-x>
- Maslowski, A. K., LaCaille, R. A., LaCaille, L. J., Reich, C. M. & Klingner, J. (2019), Effectiveness of Mental Health First Aid: a meta-analysis. *Mental Health Review Journal*, 24(4), 245-261. <https://doi.org/10.1108/MHRJ-05-2019-0016>
- Martínez-Domínguez, S. J., Lajusticia, H., Chedraui, P., & Pérez-López, F. R. (2018). The effect of programmed exercise over anxiety symptoms in midlife and older women: a meta-analysis of randomized controlled trials. *Climacteric: The Journal of the International Menopause Society*, 21(2), 123–131. <https://doi.org/10.1080/13697137.2017.1415321>
- Matvienko-Sikar, K., Flannery, C., Redsell, S., Hayes, C., Kearney, P. M., & Huizink, A. (2021). Effects of interventions for women and their partners to reduce or prevent stress and anxiety: A systematic review. *Women and Birth*, 34(2), e97–e117. <https://doi.org/10.1016/j.wombi.2020.02.010>
- McCabe, J. E., Wickberg, B., Deberg, J., Davila, R. C., & Segre, L. S. (2021). Listening visits for maternal depression: A meta-analysis. *Archives of Women's Mental Health*. <https://doi.org/10.1007/s00737-020-01101-4>
- Melnyk, B. M., Kelly, S. A., Stephens, J., Dhakal, K., McGovern, C., Tucker, S., ... Bird, S. B. (2020). Interventions to improve mental health, well-being, physical health, and lifestyle behaviors in physicians and nurses: A systematic review. *American Journal of Health Promotion: AJHP*, 34(8), 929–941. <https://doi.org/http://dx.doi.org/10.1177/0890117120920451>
- Missler, M., Donker, T., Beijers, R., Ciharova, M., Moyse, C., de Vries, R., ... van Straten, A. (2021). Universal prevention of distress aimed at pregnant women: a systematic review and meta-analysis of psychological interventions. *BMC Pregnancy and Childbirth*, 21(1), 276. <https://doi.org/10.1186/s12884-021-03752-2>

- Moore, T. H. M., Kapur, N., Hawton, K., Richards, A., Metcalfe, C., & Gunnell, D. (2017). Interventions to reduce the impact of unemployment and economic hardship on mental health in the general population: A systematic review. *Psychological Medicine*, 47(6), 1062–1084. <https://doi.org/10.1017/S0033291716002944>
- Moore, T. H. M., Kesten, J. M., López-López, J. A., Ijaz, S., McAleenan, A., Richards, A., ... Audrey, S. (2018). The effects of changes to the built environment on the mental health and well-being of adults: Systematic review. *Health and Place*, 53, 237–257. <https://doi.org/10.1016/j.healthplace.2018.07.012>
- Morgan, A. J., Reavley, N. J., Ross, A., Too, L. S., & Jorm, A. F. (2018). Interventions to reduce stigma towards people with severe mental illness: Systematic review and meta-analysis. *Journal of Psychiatric Research*, 103, 120–133. <https://doi.org/10.1016/j.jpsychires.2018.05.017>
- Mygind, L., Kjeldsted, E., Hartmeyer, R., Mygind, E., Bølling, M., & Bentsen, P. (2019). Mental, physical and social health benefits of immersive nature-experience for children and adolescents: A systematic review and quality assessment of the evidence. *Health and Place*, 58. <https://doi.org/10.1016/j.healthplace.2019.05.014>
- Ng, Y.-L., Ma, F., Ho, F. K., Ip, P., & Fu, K. (2019). Effectiveness of virtual and augmented reality-enhanced exercise on physical activity, psychological outcomes, and physical performance: A systematic review and meta-analysis of randomized controlled trials. *Computers in Human Behavior*, 99, 278–291. <https://doi.org/10.1016/j.chb.2019.05.026>
- Niclasen, J., Lund, L., Obel, C., & Larsen, L. (2019). Mental health interventions among older adults: A systematic review. *Scandinavian Journal of Public Health*, 47(2), 240–250. <https://doi.org/10.1177/1403494818773530>
- Nigatu, Y. T., Huang, J., Rao, S., Gillis, K., Merali, Z., & Wang, J. (2019). Indicated prevention interventions in the workplace for depressive symptoms: A systematic review and meta-analysis. *American Journal of Preventive Medicine*, 56(1), e23–e33. <https://doi.org/10.1016/j.amepre.2018.08.027>
- Nigdelis, M. P., Martínez-Domínguez, S. J., Goulis, D. G., & Pérez-López, F. R. (2018). Effect of programmed exercise on perceived stress in middle-aged and old women: A

- meta-analysis of randomized trials. *Maturitas*, 114, 1–8.
<https://doi.org/10.1016/j.maturitas.2018.05.004>
- Noble, C., Medin, D., Quail, Z., Young, C., & Carter, M. (2021). How does participation in formal education or learning for older people affect wellbeing and cognition? A systematic literature review and meta-analysis. *Gerontology & Geriatric Medicine*, 7, 2333721420986027. <https://doi.org/10.1177/2333721420986027>
- Odgers, K., Dargue, N., Creswell, C., Jones, M. P., & Hudson, J. L. (2020). The limited effect of mindfulness-based interventions on anxiety in children and adolescents: A meta-analysis. *Clinical Child and Family Psychology Review*, 23(3), 407–426.
<https://doi.org/10.1007/s10567-020-00319-z>
- Oliveira, S., Roberto, M. S., Veiga-Simão, A. M., & Marques-Pinto, A. (2021). A meta-analysis of the impact of social and emotional learning interventions on teachers' burnout symptoms. *Educational Psychology Review*. <https://doi.org/10.1007/s10648-021-09612-x>
- Ollevier, A., Aguiar, G., Palomino, M., & Simpelaere, I. S. (2020). How can technology support ageing in place in healthy older adults? A systematic review. *Public Health Reviews*, 41(1), 26. <https://doi.org/10.1186/s40985-020-00143-4>
- Otto, A.-K., Gutsch, C., Bischoff, L. L., & Wollesen, B. (2021). Interventions to promote physical and mental health of nurses in elderly care: A systematic review. *Preventive Medicine*, 148. <https://doi.org/10.1016/j.ypmed.2021.106591>
- Pallavicini, F., Ferrari, A., & Mantovani, F. (2018). Video games for well-being: A systematic review on the application of computer games for cognitive and emotional training in the adult population. *Frontiers in Psychology*, 9(NOV).
<https://doi.org/10.3389/fpsyg.2018.02127>
- Park, S., Kim, J., Oh, J., & Ahn, S. (2020). Effects of psychoeducation on the mental health and relationships of pregnant couples: A systemic review and meta-analysis. *International Journal of Nursing Studies*, 104.
<https://doi.org/10.1016/j.ijnurstu.2019.103439>

- Petrie, K., Crawford, J., Baker, S. T. E., Dean, K., Robinson, J., Veness, B. G., ... Harvey, S. B. (2019). Interventions to reduce symptoms of common mental disorders and suicidal ideation in physicians: A systematic review and meta-analysis. *The Lancet. Psychiatry*, 6(3), 225–234. [https://doi.org/10.1016/S2215-0366\(18\)30509-1](https://doi.org/10.1016/S2215-0366(18)30509-1)
- Phillips, E. A., Gordeev, V. S., & Schreyögg, J. (2019). Effectiveness of occupational e-mental health interventions: A systematic review and meta-analysis of randomized controlled trials. *Scandinavian Journal of Work, Environment and Health*, 45(6), 560–576. <https://doi.org/10.5271/sjweh.3839>
- Purgato, M., Richards, J., Prina, E., Kip, A., Del Piccolo, L., Michencigh, G., ... Barbui, C. (2021). Efficacy of physical activity interventions on psychological outcomes in refugee, asylum seeker and migrant populations: A systematic review and meta-analysis. *Psychology of Sport and Exercise*, 54. <https://doi.org/10.1016/j.psychsport.2021.101901>
- Rayce, S. B., Rasmussen, I. S., V ver, M. S., & Pontoppidan, M. (2020). Effects of parenting interventions for mothers with depressive symptoms and an infant: Systematic review and meta-analysis. *BJPsych Open*, 6(1). <https://doi.org/10.1192/bjo.2019.89>
- Reangsing, C., Punsuwun, S., & Schneider, J. K. (2021a). Effects of mindfulness interventions on depressive symptoms in adolescents: A meta-analysis. *International Journal of Nursing Studies*, 115. <https://doi.org/10.1016/j.ijnurstu.2020.103848>
- Reangsing, C., Rittiwong, T., & Schneider, J. K. (2021b). Effects of mindfulness meditation interventions on depression in older adults: A meta-analysis. *Aging & Mental Health*, 25(7), 1181–1190. <https://doi.org/10.1080/13607863.2020.1793901>
- Rigabert, A., Motrico, E., Moreno-Peral, P., Resurrección, D. M., Conejo-Cerón, S., Cuijpers, P., ... Bellón, J. Á. (2020). Effectiveness of online psychological and psychoeducational interventions to prevent depression: Systematic review and meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 82. <https://doi.org/10.1016/j.cpr.2020.101931>
- Rodriguez-Ayllon, M., Cadenas-Sánchez, C., Estévez-López, F., Muñoz, N. E., Mora-Gonzalez, J., Migueles, J. H., ... Esteban-Cornejo, I. (2019). Role of physical activity and sedentary behavior in the mental health of preschoolers, children and adolescents: A

- systematic review and meta-analysis. *Sports Medicine (Auckland, N.Z.)*, 49(9), 1383–1410. <https://doi.org/10.1007/s40279-019-01099-5>
- Rojas, L. M., Bahamón, M., Wagstaff, R., Ferre, I., Perrino, T., Estrada, Y., ... Prado, G. (2019). Evidence-based prevention programs targeting youth mental and behavioral health in primary care: A systematic review. *Preventive Medicine*, 120, 85–99. <https://doi.org/10.1016/j.ypmed.2018.12.009>
- Ruiz-Íñiguez, R., Santed Germán, M. Á., Burgos-Julián, F. A., Díaz-Silveira, C., & Carralero Montero, A. (2020). Effectiveness of mindfulness-based interventions on anxiety for children and adolescents: A systematic review and meta-analysis. *Early Intervention in Psychiatry*, 14(3), 263–274. <https://doi.org/10.1111/eip.12849>
- Saad, A., Magwood, O., Aubry, T., Alkhateeb, Q., Hashmi, S. S., Hakim, J., ... Pottie, K. (2021). Mobile interventions targeting common mental disorders among pregnant and postpartum women: An equity-focused systematic review. *PloS One*, 16(10), e0259474. <https://doi.org/10.1371/journal.pone.0259474>
- Sabey, C. V, Charlton, C. T., Pyle, D., Lignugaris-Kraft, B., & Ross, S. W. (2017). A Review of Classwide or Universal Social, Emotional, Behavioral Programs for Students in Kindergarten. *Review of Educational Research*, 87(3), 512–543. <https://doi.org/10.3102/0034654316689307>
- Sakuraya, A., Imamura, K., Watanabe, K., Asai, Y., Ando, E., Eguchi, H., ... Kawakami, N. (2020). What Kind of Intervention Is Effective for Improving Subjective Well-Being Among Workers? A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.528656>
- Salazar de Pablo, G., De Micheli, A., Nieman, D. H., Correll, C. U., Kessing, L. V, Pfennig, A., ... Fusar-Poli, P. (2020). Universal and selective interventions to promote good mental health in young people: Systematic review and meta-analysis. *European Neuropsychopharmacology*, 41, 28–39. <https://doi.org/10.1016/j.euroneuro.2020.10.007>
- Sánchez-Polán, M., Franco, E., Silva-José, C., Gil-Ares, J., Pérez-Tejero, J., Barakat, R., & Refoyo, I. (2021). Exercise During Pregnancy and Prenatal Depression: A Systematic

Review and Meta-Analysis. *Frontiers in Physiology*, 12.

<https://doi.org/10.3389/fphys.2021.640024>

- Sanchez, A. L., Cornacchio, D., Poznanski, B., Golik, A. M., Chou, T., & Comer, J. S. (2018). The effectiveness of school-based mental health services for elementary-aged children: A meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57(3), 153–165. <https://doi.org/10.1016/j.jaac.2017.11.022>
- Sangsawang, B., Wacharasin, C., & Sangsawang, N. (2019). Interventions for the prevention of postpartum depression in adolescent mothers: A systematic review. *Archives of Women's Mental Health*, 22(2), 215–228. <https://doi.org/10.1007/s00737-018-0901-7>
- Sasaki, N., Yasuma, N., Obikane, E., Narita, Z., Sekiya, J., Inagawa, T., ... Nishi, D. (2021). Psycho-educational interventions focused on maternal or infant sleep for pregnant women to prevent the onset of antenatal and postnatal depression: A systematic review. *Neuropsychopharmacology Reports*, 41(1), 2–13. <https://doi.org/10.1002/npr2.12155>
- Schumer, M. C., Lindsay, E. K., & Creswell, J. D. (2018). Brief mindfulness training for negative affectivity: A systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology*, 86(7), 569–583. <https://doi.org/10.1037/ccp0000324>
- Seedaket, S., Turnbull, N., Phajan, T., & Wanchai, A. (2020). Improving mental health literacy in adolescents: systematic review of supporting intervention studies. *Tropical Medicine and International Health*, 25(9), 1055–1064. <https://doi.org/10.1111/tmi.13449>
- Segal, S. C., Vyas, S. S., & Monson, C. M. (2021). A systematic review of mindfulness-based interventions in low-income schools. *Mindfulness*, 12(6), 1316–1331. <https://doi.org/10.1007/s12671-020-01571-8>
- Sheridan, S. M., Smith, T. E., Kim, E. M., Beretvas, S. N., & Park, S. (2019). A meta-analysis of family-school interventions and children's social-emotional functioning: Moderators and components of efficacy. *Review of Educational Research*, 89(2), 296–332. <https://doi.org/10.3102/0034654318825437>

- Sivaramakrishnan, D., Fitzsimons, C., Kelly, P., Ludwig, K., Mutrie, N., Saunders, D. H., & Baker, G. (2019). The effects of yoga compared to active and inactive controls on physical function and health related quality of life in older adults- systematic review and meta-analysis of randomised controlled trials. *The International Journal of Behavioral Nutrition and Physical Activity*, 16(1), 33. <https://doi.org/10.1186/s12966-019-0789-2>
- Spinelli, C., Wisener, M., & Khoury, B. (2019). Mindfulness training for healthcare professionals and trainees: A meta-analysis of randomized controlled trials. *Journal of Psychosomatic Research*, 120, 29. <https://doi.org/http://dx.doi.org/10.1016/j.jpsychores.2019.03.003>
- Stratton, E., Lampit, A., Choi, I., Calvo, R. A., Harvey, S. B., & Glozier, N. (2017). Effectiveness of eHealth interventions for reducing mental health conditions in employees: A systematic review and meta-analysis. *PLoS ONE*, 12(12). <https://doi.org/10.1371/journal.pone.0189904>
- Suleiman-Martos, N., Gomez-Urquiza, J. L., Aguayo-Estremera, R., Cañadas-De La Fuente, G. A., De La Fuente-Solana, E. I., & Albendín-García, L. (2020). The effect of mindfulness training on burnout syndrome in nursing: A systematic review and meta-analysis. *Journal of Advanced Nursing*, 76(5), 1124–1140. <https://doi.org/10.1111/jan.14318>
- Sun, Y., Lamoreau, R., O'connell, S., Horlick, R., & Bazzano, A. N. (2021). Yoga and mindfulness interventions for preschool-aged children in educational settings: A systematic review. *International Journal of Environmental Research and Public Health*, 18(11). <https://doi.org/10.3390/ijerph18116091>
- Suto, M., Takehara, K., Yamane, Y., & Ota, E. (2017). Effects of prenatal childbirth education for partners of pregnant women on paternal postnatal mental health and couple relationship: A systematic review. *Journal of Affective Disorders*, 210, 115–121. <https://doi.org/10.1016/j.jad.2016.12.025>
- Tay, J. L., Tay, Y. F., & Klainin-Yobas, P. (2018). Effectiveness of information and communication technologies interventions to increase mental health literacy: A

- systematic review. *Early Intervention in Psychiatry*, 12(6), 1024–1037.
<https://doi.org/10.1111/eip.12695>
- Taylor, R. D., Oberle, E., Durlak, J. A., & Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Development*, 88(4), 1156–1171.
<https://doi.org/10.1111/cdev.12864>
- Teoh, S. L., Letchumanan, V., & Lee, L.-H. (2021). Can Mindfulness Help to Alleviate Loneliness? A Systematic Review and Meta-Analysis. *Frontiers in Psychology*, 12.
<https://doi.org/10.3389/fpsyg.2021.633319>
- Thompson, E. M., Destree, L., Albertella, L., & Fontenelle, L. F. (2021). Internet-based acceptance and commitment therapy: A transdiagnostic systematic review and meta-analysis for mental health outcomes. *Behavior Therapy*, 52(2), 492–507.
<https://doi.org/10.1016/j.beth.2020.07.002>
- Tong, F., Yu, C., Wang, L., Chi, I., & Fu, F. (2021). Systematic Review of Efficacy of Interventions for Social Isolation of Older Adults. *Frontiers in Psychology*.
<https://doi.org/10.3389/fpsyg.2021.554145>
- Tsai, Z., Kiss, A., Nadeem, S., Sidhom, K., Owais, S., Faltyn, M., & Lieshout, R. J. Van. (2021). Evaluating the effectiveness and quality of mobile applications for perinatal depression and anxiety: A systematic review and meta-analysis. *Journal of Affective Disorders*, 296, 443–453. <https://doi.org/10.1016/j.jad.2021.09.106>
- Twomey, C., & O'Reilly, G. (2017). Effectiveness of a freely available computerised cognitive behavioural therapy programme (MoodGYM) for depression: Meta-analysis. *Australian & New Zealand Journal of Psychiatry*, 51(3), 260–269.
<https://doi.org/10.1177/0004867416656258>
- Twomey, C., O'Reilly, G., & Meyer, B. (2017). Effectiveness of an individually-tailored computerised CBT programme (Deprexis) for depression: A meta-analysis. *Psychiatry Research*, 256, 371–377. <https://doi.org/10.1016/j.psychres.2017.06.081>

- Twomey, C., O'Reilly, G., Bültmann, O., & Meyer, B. (2020). Effectiveness of a tailored, integrative Internet intervention (depaxis) for depression: Updated meta-analysis. *PloS one*, 15(1), e0228100. <https://doi.org/10.1371/journal.pone.0228100>
- Valdés-Badilla, P., Herrera-Valenzuela, T., Ramirez-Campillo, R., Aedo-Muñoz, E., Báez-San Martín, E., Ojeda-Aravena, A., & Branco, B. H. M. (2021). Effects of olympic combat sports on older adults' health status: a systematic review. *International Journal of Environmental Research and Public Health*, 18(14). <https://doi.org/10.3390/ijerph18147381>
- van de Sande, M. C. E., Fekkes, M., Kocken, P. L., Diekstra, R. F. W., Reis, R., & Gravesteyn, C. (2019). Do universal social and emotional learning programs for secondary school students enhance the competencies they address? A systematic review. *Psychology in the Schools*, 56(10), 1545–1567. <https://doi.org/10.1002/pits.22307>
- van Genugten, L., Dusseldorp, E., Massey, E. K., & van Empelen, P. (2017). Effective self-regulation change techniques to promote mental wellbeing among adolescents: A meta-analysis. *Health Psychology Review*, 11(1), 53–71. <https://doi.org/10.1080/17437199.2016.1252934>
- van Loon, A. W. G., Creemers, H. E., Beumer, W. Y., Okorn, A., Vogelaar, S., Saab, N., ... Asscher, J. J. (2020). Can schools reduce adolescent psychological stress? A multilevel meta-analysis of the effectiveness of school-based intervention programs. *Journal of Youth and Adolescence*, 49(6), 1127–1145. <https://doi.org/10.1007/s10964-020-01201-5>
- Vekety, B., Logemann, H. N. A., & Takacs, Z. K. (2021). The effect of mindfulness-based interventions on inattentive and hyperactive–impulsive behavior in childhood: A meta-analysis. *International Journal of Behavioral Development*, 45(2), 133–145. <https://doi.org/10.1177/0165025420958192>
- Velana, M., & Rinkenauer, G. (2021). Individual-Level Interventions for Decreasing Job-Related Stress and Enhancing Coping Strategies Among Nurses: A Systematic Review. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.708696>
- Victorson, D. E., Sauer, C. M., Wolters, L., Maletich, C., Lukoff, K., & Sufrin, N. (2020). Meta-analysis of Technology-Enabled Mindfulness-Based Programs for Negative Affect

- and Mindful Awareness. *Mindfulness*, 11(8), 1884–1899.
<https://doi.org/10.1007/s12671-020-01373-y>
- Vonderlin, R., Biermann, M., Bohus, M., & Lyssenko, L. (2020). Mindfulness-Based Programs in the Workplace: a Meta-Analysis of Randomized Controlled Trials. *Mindfulness*, 11(7), 1579–1598. <https://doi.org/10.1007/s12671-020-01328-3>
- Waldron, S. M., Stallard, P., Grist, R., & Hamilton-Giachritsis, C. (2018). The ‘long-term’ effects of universal school-based anxiety prevention trials: A systematic review. *Mental Health and Prevention*, 11, 8–15. <https://doi.org/10.1016/j.mhp.2018.04.003>
- Waldrop, J., Baker, M., Salomon, R., & Moreton, E. (2021). Parenting Interventions and Secondary Outcomes Related to Maternal Mental Health: A Systematic Review. *Maternal and Child Health Journal*, 25(6), 870–880. <https://doi.org/10.1007/s10995-021-03130-6>
- Wan Mohd Yunus, W. M. A., Musiat, P., & Brown, J. S. L. (2018). Systematic review of universal and targeted workplace interventions for depression. *Occupational and Environmental Medicine*, 75(1), 66–75. <https://doi.org/10.1136/oemed-2017-104532>
- Wang, T.-H., Pai, L.-W., Tzeng, Y.-L., Yeh, T.-P., & Teng, Y.-K. (2021). Effectiveness of nurses and midwives-led psychological interventions on reducing depression symptoms in the perinatal period: A systematic review and meta-analysis. *Nursing Open*, 8(5), 2117–2130. <https://doi.org/10.1002/nop2.764>
- Waqas, A., Malik, S., Fida, A., Abbas, N., Mian, N., Miryala, S., ... Naveed, S. (2020). Interventions to reduce stigma related to mental illnesses in educational institutes: A systematic review. *Psychiatric Quarterly*, 91(3), 887–903.
<https://doi.org/10.1007/s11126-020-09751-4>
- Weber, M., Schnorr, T., Morat, M., Morat, T., & Donath, L. (2020). Effects of mind-body interventions involving meditative movements on quality of life, depressive symptoms, fear of falling and sleep quality in older adults: A systematic review with meta-analysis. *International Journal of Environmental Research and Public Health*, 17(18).
<https://doi.org/10.3390/ijerph17186556>

- Werner-Seidler, A., Perry, Y., Cascar, A. L., Newby, J. M., & Christensen, H. (2017). School-based depression and anxiety prevention programs for young people: A systematic review and meta-analysis. *Clinical Psychology Review, 51*, 30–47. <https://doi.org/10.1016/j.cpr.2016.10.005>
- Werner-Seidler, A., Spanos, S., Cascar, A. L., Perry, Y., Torok, M., O’Dea, B., ... Newby, J. M. (2021). School-based depression and anxiety prevention programs: An updated systematic review and meta-analysis. *Clinical Psychology Review, 89*. <https://doi.org/10.1016/j.cpr.2021.102079>
- Wild, J., El-Salahi, S., & Esposti, M. D. (2020). The effectiveness of interventions aimed at improving well-being and resilience to stress in first responders: A systematic review. *European Psychologist, 25*(4), 252–271. <https://doi.org/10.1027/1016-9040/a000402>
- Wolpert, M., Dalzell, K., Ullman, R., Garland, L., Cortina, M., Hayes, D., ... Law, D. (2019). Strategies not accompanied by a mental health professional to address anxiety and depression in children and young people: a scoping review of range and a systematic review of effectiveness. *The Lancet Psychiatry, 6*(1), 46–60. [https://doi.org/10.1016/S2215-0366\(18\)30465-6](https://doi.org/10.1016/S2215-0366(18)30465-6)
- Wong, K. C., Wong, F. K. Y., Yeung, W. F., & Chang, K. (2018). The effect of complex interventions on supporting self-care among community-dwelling older adults: a systematic review and meta-analysis. *Age and Ageing, 47*(2), 185–193. <https://doi.org/10.1093/ageing/afx151>
- Xu, Z., Huang, F., Kösters, M., Staiger, T., Becker, T., Thornicroft, G., & Rüsch, N. (2018). Effectiveness of interventions to promote help-seeking for mental health problems: Systematic review and meta-analysis. *Psychological Medicine, 48*(16), 2658–2667. <https://doi.org/10.1017/S0033291718001265>
- Yang, W., Datu, J. A. D., Lin, X., Lau, M. M., & Li, H. (2019). Can early childhood curriculum enhance social-emotional competence in low-income children? A meta-analysis of the educational effects. *Early Education and Development, 30*(1), 36–59. <https://doi.org/10.1080/10409289.2018.1539557>

- Yasuma, N., Narita, Z., Sasaki, N., Obikane, E., Sekiya, J., Inagawa, T., ... Nishi, D. (2020). Antenatal psychological intervention for universal prevention of antenatal and postnatal depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, 273, 231–239. <https://doi.org/10.1016/j.jad.2020.04.063>
- Zheng, L. R., Oberle, C. M., Hawkes-Robinson, W. A., & Daniau, S. (2021). Serious Games as a Complementary Tool for Social Skill Development in Young People: A Systematic Review of the Literature. *Simulation and Gaming*. <https://doi.org/10.1177/10468781211031283>
- Zhu, Y., Wang, R., Tang, X., Li, Q., Xu, G., & Zhang, A. (2021). The effect of music, massage, yoga and exercise on antenatal depression: A meta-analysis. *Journal of Affective Disorders*, 292, 592–602. <https://doi.org/10.1016/j.jad.2021.05.122>
- Zoogman, S., Goldberg, S. B., Voursura, E., Diamond, M. C., & Miller, L. (2019). Effect of yoga-based interventions for anxiety symptoms: A meta-analysis of randomized controlled trials. *Spirituality in Clinical Practice*, 6(4), 256–278. <https://doi.org/10.1037/scp0000202>

EVIDENCE TABLES

List of tables

Evidence table		Page number
Early years and family interventions	Meta-analyses	104-113
	Systematic reviews	114-119
School-based interventions	Meta-analyses	119-125
	Systematic reviews	126-130
Community interventions (Youth)	Meta-analyses	130-137
	Systematic reviews	137-139
Community interventions (Adults)	Meta-analyses	139-143
	Systematic reviews	144-145
Community interventions (Older adults)	Meta-analyses	145-152
	Systematic reviews	152-156
Workplace interventions	Meta-analyses	156-163
	Systematic reviews	163-168
Digital interventions	Meta-analyses	169-172
	Systematic reviews	172-173
Primary Care	Meta-analyses	174-174
	Systematic reviews	174-175
Awareness raising	Meta-analyses	175-177
	Systematic reviews	177-179

Early years and family interventions – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other findings
Perinatal interventions								
Zhu et al., 2021	11	Pregnant women with or without depression	-	Yoga, massage, music, exercise therapy interventions	N=24 RCT	Antenatal depression and anxiety	Yoga: Depression + (SMD=-0.45) Anxiety + (SMD=-0.87) Massage: Depression + (SMD=-0.43) Anxiety + (SMD=-0.26) Music: Depression + (SMD=-1.35) Anxiety + (SMD=-1.63) Exercise: Antenatal depression + (SMD=-0.66)	Massage performed by partner or therapist Music significantly more effective than massage and yoga interventions. Included studies published in English and Chinese
Evans et al., 2018	11	Pregnant women with mild to moderate symptoms of anxiety	Mixed	Individual and group anxiety prevention interventions (psychological, mind-body, educational, supportive)	N=25 RCT	Anxiety	Anxiety 0	Meta-analysis only conducted on three studies which focused on mindfulness-based group interventions. Studies characterised by small sample sizes and inadequate reporting of methods.
Missler et al., 2021	11	Pregnant women	Mixed	Universal psychological prevention interventions for depression, anxiety or stress	N=12	Maternal, depression, anxiety and stress	Maternal distress + (d= 0.52) Depressive symptoms + (d = 0.50) Stress + (d=0.52) Anxiety + (d=0.30)	Effects not associated with intervention timing, type or delivery mode. Low number of studies measuring anxiety (n=4) and stress (n=5), and therefore,

				(Mindfulness, CBT, IPT, psychoeducation)				<p>the results should be interpreted with caution.</p> <p>Infant or partner outcomes not measured in most studies.</p> <p>Mainly group-based interventions delivered prenatally.</p>
Corbjin Van Willenswaard et al., 2017	9	Pregnant women	Mixed	Music interventions	N=5 RCT, QE	Maternal stress and anxiety	<p>Anxiety + (SMD=-0.21)</p> <p>General stress 0</p> <p>Pregnancy specific stress 0</p>	<p>Methodological quality of studies moderate to weak.</p> <p>Interventions included listening to music during transvaginal ultrasound, listening to music for 30min daily for 3 – 14 days and 1h session with music therapist.</p>
Yasuma et al., 2020	11	Pregnant women	-	<p>Universal depression prevention interventions</p> <p>(CBT, IPT, mindfulness, psychoeducation)</p>	N=18 RCT, cRCT	Antenatal and postnatal depression	<p>Antenatal depression + (SMD=0.28)</p> <p>Postnatal depression + (SMD=0.37)</p> <p>CBT (n=10):</p> <p>Antenatal depression + (SMD=0.53)</p> <p>Postnatal depression 0</p>	Methodological issues common across studies.
Dhillon et al., 2017	10	Pregnant women	-	Mindfulness	N=6 RCT	Depression, anxiety, perceived stress	<p>Depression 0</p> <p>Anxiety 0</p> <p>Perceived stress 0</p> <p>Mindfulness + (SMD=-0.57)</p>	Analysis of pre-post studies showed significant impact on depression, anxiety and stress.
Guo et al., 2021	11	Pregnant women	-	Mind-body interventions	N=28 RCT	Maternal stress, anxiety and depression	<p>Antenatal stress + (SMD=-0.94)</p> <p>Anxiety + (SMD=-0.59)</p> <p>Depression + (SMD=-0.67)</p>	All types of interventions delivered individually or in groups found effective, with 4-8 weeks duration optimal.

				(mindfulness, CBT, relaxation, yoga)				High heterogeneity and publication bias.
Sanchez-Polan et al., 2021	8	Pregnant women		Exercise interventions during pregnancy	N=15 RCT	Prenatal depression	Prenatal depression + (ES=-0.36) Inactive women had a 16% higher risk of developing prenatal depression (RR=0.84)	All but one study used light-to-moderate intensity exercise. All but one study used supervised exercised.
Wang et al., 2021	10	Perinatal women at no known risk or at risk of perinatal depression	Community , primary care or hospital	Nurses and midwives led psychological interventions	N=12 RCT, QE	Perinatal depression	Risk of developing depression symptoms within 2 weeks and 9-12 weeks post-intervention reduced by 36% (RR=0.64) and 25% (RR=0.74)	Cognitive behavioural approaches and supportive counselling can significantly reduce depressive symptoms, but psychological education did not show significant effect.
Corbally & Wilkinson, 2021	11	Perinatal women (pregnancy to 1 year postnatally)	-	Mindfulness	N=12 RCT, QE	Depression, stress, mindfulness	Depression + (d=-0.20) Stress 0 (d=-0.21) Mindfulness + (d=0.24)	Lack of sufficient studies for anxiety inhibited meta-analysis
Huang et al., 2020	11	Perinatal women with or at risk of perinatal depression	Mixed	Peer support	N=10 RCT	Perinatal depression	Depression + (SMD=-0.37) Risk of developing depression reduced by 31% (RR=0.69)	Studies that reported on cost-effectiveness and user satisfaction indicated that peer support is a cost efficient and acceptable intervention
Tsai et al. 2021	9	Perinatal women	Digital	mHealth Apps	N=7	Perinatal depression and anxiety	Perinatal depression 0 (SMD=-0.39) Perinatal anxiety 0 (SMD=0.01)	Current mHealth Apps in the app store (n=37) were rated moderate in quality in terms of engagement, functionality, aesthetics and information quality.

								Few apps in the app store are clinically tested. Clinically tested apps are generally not commercially available.
McCabe et al. 2021	11	Postpartum women	Home	Listening Visits (nurse delivered non-directive person-centred therapy)	N=6 RCT, QE	Maternal depression	Maternal depression + (g=0.43)	Intervention delivered by primary care nurses over 4-6 sessions in mothers' homes. Nurses trained in non-directive person-centred therapy, based on social support and assisted problem solving.
Lin et al., 2018	11	Postpartum women	-	Exercise interventions	N=3 RCT	Postpartum depression	Postpartum depression 0	This review also included treatment studies using a range of self-help approaches, which were analysed separately and shown to be effective for postpartum depression.
Carter et al., 2019	11	Postnatal women with or without symptoms of depression	-	Universal (n=8), targeted (n=8) and treatment (n=2) exercise interventions	N=17 RCT	Maternal depression	Depressive symptoms + (SMD=-0.64) Physical function 0 Mental function 0	<p>This study also included treatment interventions (n=2). Targeted and treatment interventions (SMD=-0.75) yielded a greater effect size than universal interventions (SMD=-0.52)</p> <p>Interventions with active exercise-oriented component yielded larger effect sizes than those with motivational/coaching components.</p>

								Effect sizes not calculated for anxiety due to the dearth of information.
Family support interventions in infancy and early years								
Fentz & Trillinsgaard, 2017	9	Couples	Private practice (therapist)	Assessment and feedback intervention on marital functioning	N=12 RCT	Marital functioning, individual mental health (personal distress, positive/negative affect, depression, anxiety)	Marital functioning + (g=0.20) Mental health + (g=0.23)	Intervention effects maintained up to 6-months follow-up. Only three studies measured mental health. No significant moderating factors detected.
Park et al., 2020	10	Pregnant couples	-	Group psychoeducation around childbirth, childcare and marital relationships	N=7 RCT	Relationship quality, parental mental health (depression, anxiety negative affect)	Maternal depression + (SMD=-0.309) Maternal negative affect + (SMD=-0.413) Paternal negative affect + (SMD=-0.432) Maternal/paternal anxiety 0 Maternal perception of relationship quality + (SMD=0.125) Paternal perception of relationship quality + (SMD=0.348) Couple communication 0	Evidence of heterogeneity for the overall outcomes across studies Interventions conducted by nurses/midwives showed stronger effects than those delivered by other providers (psychologists, social workers, occupational therapists, lay people)
Rayce et al., 2020	10	Mothers with depressive symptoms with	Home	Parenting interventions (postpartum individual home-visits)	N=7 RCT	Parent-child relationship, child development	Parent-child relationship 0	Interventions varied in terms of delivery, duration and intensity. Due to the lack of developmental outcomes

		infants (<1 year)		using video-feedback, coaching, therapy)				included in studies, it was not possible to conduct meta-analysis on developmental outcomes.
Adina et al., 2021	11	Mothers (pregnancy to up to 1 year after birth)	Home, digital	Parenting interventions	N=16 RCT	Perinatal depression, infant development	Maternal depression + (SMD=-0.34)	<p>Data on infant development scarce across studies, and meta-analysis could not be conducted</p> <p>Interventions focused on supporting mother-child interactions, attachment and relationships and competency using various approaches (e.g. video feedback, peer support, play groups, apps, home visiting, telephone sessions, training)</p> <p>Seven studies recruited mothers with baseline moderate to severe levels of depression.</p>
Parenting interventions								
Ling et al., 2021	11	Socioeconomically disadvantaged parents	Mixed	Stress management interventions	N=45 RCT, QE	Parental mental health	Parental stress + (ES=-0.24) Depression + (ES=-0.15)	<p>Interventions conducted in developing countries and those of shorter duration (1-3 months as opposed to 6+ months) had significantly larger effects on stress. Non-randomisation was also associated with larger effects.</p> <p>CBT and mindfulness-based interventions resulted in significantly larger reductions</p>

								<p>in depression than interventions focusing on parenting/self-care/life skills. Limited evidence of long-term effects.</p> <p>Only two studies measured anxiety.</p>
Burgdorf et al., 2019	10	Parents	-	Mindfulness interventions for parents	N=6 RCT	Parenting stress, youth psychological outcomes	Parenting stress + (g=0.44)	<p>This review also included single-group studies, but the results are not reported here.</p> <p>No analysis was conducted on youth outcomes due to the small number of studies measuring these outcomes.</p> <p>Serious risk of bias across studies, however, publication bias trivial.</p>
Carr et al., 2017	8	Parents of children aged 2-17 years	Community clinical	Parents Plus parenting intervention	N=12 RCT, QE	Child behaviour problems and parent outcomes	<p>Child behavioural problems + (ES=0.57)</p> <p>Goal attainment + (ES=1.51)</p> <p>Parental satisfaction + (ES=0.78)</p> <p>Parental stress + (ES=0.54)</p>	<p>Significantly better outcomes in smaller trials with younger children with less severe problems, who attended more sessions and had less concurrent child intervention.</p> <p>Five single group studies also included in the review, but findings not discussed here.</p>
Flujas-Contreras et al., 2019	10	Parents	Digital	Technology-based parenting interventions	N=22 RCT, QE	Parenting and parental wellbeing	<p>Overall parental outcomes + (g=0.61)</p> <p>Parental knowledge + (g=0.73)</p> <p>Parental self-efficacy + (g=0.35)</p>	<p>Interventions were targeted at parents of children with psychological or physical concerns, with the majority (n=13) targeting parents of children with psychological</p>

							Parental stress 0 (g=1.78)	<p>problems (mainly disruptive behavioural problems).</p> <p>Interventions included: psycho-educational (n=9), Triple P (n=8), CBT (n=5), Parent-Child Interaction Therapy (n=2).</p> <p>Nine of the studies classified as treatment interventions.</p>
Harris et al., 2020	9	Parents/families experiencing social disadvantage	Digital	Technology-assisted parenting interventions	N=9 RCT (n=6), pre-post (n=3)	Parental psychological wellbeing, parenting, child behaviour	<p>Parental psychological wellbeing 0 (g=0.35, p=0.51)</p> <p>Parenting + (g=0.38)</p> <p>Child behaviour + (g=0.39)</p>	<p>Interventions that did not include direct contact showed no evidence of effectiveness.</p> <p>Shorter interventions were significantly more effective.</p>
Lannes et al., 2021	11	Children (<18 years) of parents with mental ill health	Home or clinic	Prevention interventions (mainly CBT, psychoeducation, family processes) targeting families, parents or young people	N=20 RCT	Incidence of mental disorders, internalising symptoms, externalising symptoms	<p>Risk of developing a mental disorder reduced by 47% (RR=0.53)</p> <p>Internalising symptoms + (SMD=-0.25)</p> <p>Externalising symptoms 0</p>	<p>The few studies which reported follow-up data did not show that effects were maintained in long-term.</p> <p>Subgroup analyses did not reveal any significant outcome moderators.</p>
Loechner et al., 2018	11	Children (<18 years) of parents with depression	-	Prevention interventions targeting families, parents or children	N=14 RCT	Incidence of depression, symptoms of depression	<p>Symptoms of depression + (g=-0.20)</p> <p>Risk of developing depression decreased by 44% (RR=0.56)</p>	Type of intervention or control group did not moderate outcomes.
Havinga et al. 2021	10	Children and young people (6-	Clinic, home, other	Prevention interventions targeting	N=22 RCT	Incidence of anxiety/depression,	<p>Risk of developing a depressive/anxiety disorder reduced by 63% (RR=0.37) at</p>	Interventions insufficiently described, indicating a need

		25) of parents with mood/anxiety disorders		families, parents or children		symptoms of anxiety/depression	short-term (9-18 months follow-up) and by 29% at long-term (24 months + follow-up) Symptoms of anxiety/depression + (post-intervention: SMD=-0.19/ 12-month follow-up: SMD=-0.31)	for more research regarding how these interventions work
Preschool interventions								
Luo et al., 2020	11	Children (universal)	Preschool	SEL	N=33 RCT, QE	Social competence, emotional competence, challenging behaviour	Social competence + (g=0.42) Emotional competence + (g=0.33) Challenging behaviour + (g=-0.31)	Interventions with family component had significantly larger effect sizes for social competence and challenging behaviours. Teacher implementation was associated with significantly smaller effect sizes than implementation by researchers or others for challenging behaviours.
Blewitt et al., 2018	10	Children (2-6 years)	Preschool	Universal curriculum based SEL interventions	N=63 RCT, QE	Social competences, emotional competence, behavioural self-regulation, behaviour and emotional challenges, early learning outcomes	Social competence + (d=0.30) Emotional competence + (d=0.54) Behavioural self-regulation + (d=0.28) Early learning skills + (d=0.18) Behavioural and emotional challenges + (d=0.19)	Larger effects for older children and for interventions delivered by researcher or specialist as opposed to a teacher. Parent assessment suggested less improvement than teacher or researcher assessment, whereas skills-based measures rather than observer-ratings of behaviour showed the opposite effect.

Yang et al., 2018	10	Low-income children (3-5 years)	Preschool	SEL curriculum	N=29 RCT, QE	Social and emotional competence	<p>Overall social and emotional competence + (ES=0.241)</p> <p><u>Impact on positive mental health + (ES=0.183)</u></p> <p>Emotional understanding and expression + (ES=0.234)</p> <p>Positive coping behaviour + (ES=0.198)</p> <p>Positive feelings + (ES=0.933)</p> <p>Social skills + (ES=0.118)</p> <p>Attention and regulation 0</p> <p>Cooperation 0</p> <p><u>Impact on negative mental health + (ES=0.04)</u></p> <p>Aggression + (ES=-0.449)</p> <p>Attention problems + (ES=-0.463)</p> <p>Negative coping behaviour + (ES=-0.153)</p> <p>Negative feelings + (ES=-0.424)</p> <p>Social problems + (ES=-0.271)</p> <p>Behaviour problems 0</p>	<p>Curricula that did not have an intensive focus on SEL did not produce significant positive effects.</p> <p>Also, fidelity of implementation and duration moderated outcomes, so that shorter (less than one year) interventions delivered with high fidelity produced better outcomes.</p>
<p>Cognitive Behavioural Therapy (CBT); Cluster randomised controlled trial (cRCT); Effect Size (ES); Quasi-experimental study design (QE); Interpersonal therapy (IPT); Randomised Controlled Trial (RCT); Risk Ratio (RR)</p> <p><u>Interpreting effect sizes:</u> Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES: 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect</p>								

Early years and family interventions – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Perinatal interventions							
Sasaki et al., 2021	11	Pregnant women		Interventions to improve maternal and infant sleep (One-time educational sleep hygiene intervention)	N=2 RCT	Antenatal and postnatal depression	There was limited evidence to support the effectiveness of sleep interventions to improve maternal mental health. Significant difference in maternal mood between intervention and control group was found in one of the studies, however, no mood comparison was conducted between pre- and post-measurement. No significant effects were found in the other study.
Saad et al., 2021	9	Pregnant women	Digital	Mobile interventions for preventing common mental disorders	N=10 RCT, QE	Maternal depression and psychological distress	Mobile prevention interventions have a significant impact on reducing symptoms and occurrence of depression (OR=0.51) when delivered antenatally, or perinatally, however, there is limited evidence of their effectiveness on depression and anxiety when delivered postpartum. Impact of ante/perinatal interventions on anxiety and stress inconsistent. The review included ten prevention-based, eight management-based interventions. Only the findings regarding prevention interventions reported here.
Sangsawang et al., 2019	9	Adolescent mothers	Mainly at home	Psychological and psychosocial interventions for preventing postpartum depression	N=13 RCT	Postpartum depression	Six studies reported significant effects, including home visiting interventions, educational programmes, psycho-educational/CBT, infant massage training, and the REACH programme based on IPT. Seven interventions, including five home visiting programmes prenatal/infant care parenting

							<p>programme and social support intervention, did not show significant effects.</p> <p>Psychosocial interventions: home visits, ante/postnatal educational programmes, social support interventions, comprehensive early intervention programmes, infant massage training</p> <p>Psychological interventions: Psycho-educational/CBT, group IPT</p>
Matvienko-Sikar et al., 2021	11	Parents (conception to 2 years postpartum)	Mixed (mainly hospital-based)	Stress and/or anxiety prevention interventions	N=16 RCT	Parental anxiety and stress	<p>Effects inconsistent across studies, with only two studies demonstrating reductions in stress or anxiety.</p> <p>Most interventions delivered to women during pregnancy with few interventions (n=2) targeting fathers. No studies examined same-sex partners.</p> <p>High risk of bias across studies.</p>
Family support interventions in infancy and early years							
Goldstein et al., 2020	8	Fathers	Mixed	Interventions for fathers in the perinatal period (including father-focused, couple-focused and child-focused interventions)	N=14 RCT	Paternal perinatal depression	<p>Three studies found a small but significant effect on paternal depression.</p> <p>None of the interventions targeted paternal mental health directly, but instead addressed paternal depression indirectly by focusing on the mother, infant or couple relationship.</p>
Hurt et al., 2018	11	Children (0-2 years) in high-income countries	Mixed (home, private practice, hospital, community)	Universal interventions for enhancing health services for parents and children	N=22 RCT, cRCT	Child development and social and emotional wellbeing measures to 39 months of age	<p>Low intensity: educational material (videos, handouts) in health centre waiting rooms or delivered by post, access to community groups, brief parenting course, face-to-face guidance from health care providers.</p>

							<p>Moderate intensity: one-to-one home visits, group sessions, training for primary health care workers on interview techniques that encourage consideration of child development, parent training</p> <p>High intensity: multicomponent interventions which included regular contact over an extended period of time or intense contact over a shorter period of time</p> <p>Most studies did not find positive effects on motor or overall child development. Results regarding language and cognitive development and social and emotional wellbeing were mixed across studies, with most studies not reporting significant effects.</p> <p>Quality of evidence low to moderate.</p>
Suto et al., 2017	11	Partners of pregnant women		Prenatal childbirth education	N=11 RCT	Paternal mental health and couple relationship.	<p>No sufficient evidence that prenatal childbirth education for partners reduces the risk of paternal postnatal depression or improves couple relationship. However, studies were very heterogenous in terms of intervention duration and content and measures used, which impeded evaluation of intervention effectiveness.</p> <p>Interventions included topics such as: childbirth preparation, couple relationship, infants and parenting, postpartum psychosocial issues, and housework sharing.</p>
Waldrop et al., 2021	9	Mothers of children 0-5 years	Mixed	Parenting interventions	N=11 RCT	Maternal mental health	<p>This review examined the secondary impact of parenting interventions aimed to improve maternal-child interaction (focused on the needs of the child rather than the mother) on maternal mental health.</p> <p>Studies did not provide consistent evidence that parenting interventions improve maternal mental health (depression, anxiety, stress). There was</p>

							<p>substantial heterogeneity in the interventions and the outcome measures used and sample sizes were generally small, limiting robust conclusions.</p> <p>The review indicates that parenting interventions may be efficiently delivered remotely. The two interventions that were delivered remotely both showed significant improvements on depression.</p>
Parenting interventions							
Hansen et al., 2019	10	Parents	Digital	Technology-assisted parenting interventions	N=25 RCT	Parenting and child wellbeing	<p>Most studies reported some level of improvement on parents' skills although outcomes were inconsistent across studies. Most studies that measured parental mental health (depression, anxiety, stress, anger; n=8) did not report any significant outcomes. Five out of eight studies reported significant improvement in parent self-efficacy.</p> <p>Improvements generally maintained across short- and long term (up to 2 years) follow-up, although most studies did not include follow-up assessment.</p> <p>Interventions for youth externalizing symptoms that included a remote therapist component showed more consistent results on youth outcomes. Findings on interventions for youth internalizing problems were inconsistent.</p> <p>Program development and recruitment strategies to engage underserved parents under-utilised among studies.</p> <p>Interventions mainly targeted parenting factors associated with externalizing behaviours (n=14) and parents of children under the age of 5 years (n=12). Interventions focused on parenting skills (n=15),</p>

							parent-child relationship (n=5) or multiple domains (n=7).
Preschool interventions							
Lee et al., 2020	10	Children (3-7 years)	Mixed (childcare centers, preschool, primary school, clinical)	Unstructured play interventions	N=8	Physical, psychological and social health	Only two of the eight studies focused on mental health outcomes (anxiety and urinary cortisol) and both of these were conducted in clinical settings for hospitalized children. One study examined self-control, with play group sessions showing an advantage over a behavioural intervention, with borderline significance (p=0.09)
Blewitt et al., 2019	9	Children (2-6 years)	Preschool	Targeted SEL	N=19 Included 6 single subject designs	Social competences, emotional competence, behavioural self-regulation, behaviour and emotional challenges	<p>Targeted SEL interventions that incorporate social and relationship skill instruction show potential in improving children's social competence, with several studies reporting positive effects in children's social interactions, social skills, social-communicative behaviour, and teacher-child closeness.</p> <p>Inconsistent findings across studies regarding impact on emotional competence and behavioural challenges.</p> <p>Interventions mainly targeted at children with externalizing problems with limited studies focusing on children with internalizing problems.</p> <p>Significant heterogeneity in intervention content and methods, and methodological quality across studies.</p>
Sabey et al., 2017	10	Children	Preschool	Universal SEL or behavioural interventions	N=20	Antisocial behaviour, prosocial behaviour, skills acquisition, emotional awareness	Behavioural interventions showed the strongest effects on increasing prosocial behaviour and decreasing antisocial behaviour. SEL interventions were of lower quality and produced smaller effects than behavioural interventions. Small number of studies measuring emotional awareness inhibited drawing any meaningful conclusions.

							Moderator analysis found significant effects for duration of intervention, with shorter interventions showing significantly larger effects
Sun et al., 2021	9	Children (3-5 years)	Preschool	Yoga and mindfulness	N=16 1 pre-post study included	Social and emotional functioning	<p>Yoga and mindfulness interventions have potential for improving children's regulatory skills in relation to behaviour, attention and emotions, with thirteen studies reporting improvements in these domains. However, significant heterogeneity regarding study quality and outcome measures used.</p> <p>Longer interventions (over 6-week) among children with lower baseline social and emotional functioning associated with better outcomes.</p>
Cognitive Behavioural Therapy (CBT); Cluster randomised controlled trial (cRCT); Quasi-experimental study design (QE); Interpersonal therapy (IPT); Odds Ratio (OR); Randomised Controlled Trial (RCT); Social and emotional learning (SEL)							

School-based interventions – Meta-analyses

Author Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other findings
Social and emotional/Skills-based interventions								
Corcoran et al., 2018	9	Children (Preschool to Grade 12)	Schools	Universal SEL interventions	N=40 RCT, QE	Academic achievement only	<p>Academic performance in:</p> <p>Reading +(ES = 0.25)</p> <p>Mathematics + (ES = 0.26)</p> <p>Science + (ES = 0.19)</p>	<p>Effects may vary by research design. For example, the mean effect sizes for randomized trials are typically lower than for quasi-experimental studies.</p> <p>Out of the 40 qualified studies, 19 (reading) and 18 (maths) of them respectively were large, randomized experiments.</p>

								More randomised studies are needed to examine the effectiveness of promising programmes.
Taylor et al., 2017	9	Children (Kindergarten to Highschool)	Schools	Universal SEL programmes	N=82 RCT, QE	Social and emotional skills, Attitudes towards self, others and school, Academic performance , Conduct problems, Emotional distress, Substance use	SEL skills + (ES = .23) Attitudes + (ES = .13) Positive social behaviour + (ES = .13) Academic performance + (ES = .33) Conduct problems + (ES = .14) Emotional distress + (ES = .16) Substance use + (ES = .16) Wellbeing (five outcomes) + (ES = .18)	Implementation issues (18.3%) Follow-up to Durlak et al., 2011 study Mean follow-up periods varied from 56 to 195 weeks Moderators Higher sample attrition = lower ES Age (childhood group = larger effect sizes compared to early adolescence and adolescence) *Age not a significant predictor when indicators of wellbeing combined Participants' race, socio-economic background and school location did not impact on programme outcomes.
Goldberg et al., 2019	11	Children 4-18 years	Schools	Whole school social and emotional development interventions	N= 45 RCT, QE	Social and emotional adjustment, Behavioural adjustment, Internalizing symptoms	Social and emotional adjustment ($d = 0.220$) Behavioural Adjustment ($d = 0.134$)	Moderators: Quality assessment (moderate/weak) = higher effect sizes Inclusion of community component = higher effect sizes

							Internalising symptoms ($d = 0.109$)	Interventions evaluated in US higher effect sizes
Sheridan et al., 2019	8	Children (Preschool to secondary schools)	Schools	Family-school partnership interventions	N= 117 RCT, QE / Pre- post design*	Social- behavioural competence (prosocial skills, peer relationships , self- regulation, externalizing problems) Mental health (internalizin g concerns, self-esteem, emotion regulation)	Social behavioural competence + ($g=0.33$) Mental health outcomes + ($g=0.39$)	Moderators <ul style="list-style-type: none"> • Race/ethnicity (effects were larger for African American students) • Location (effects were smaller in urban settings relative to nonurban/rural settings) Components related to positive outcomes included: <ul style="list-style-type: none"> • interpersonal, relational processes (i.e., communication, collaboration, and parent-teacher relationship) • tangible, structural elements (i.e., home-based involvement, behavioural supports).
Stress, Anxiety, Depression Prevention								
Caldwell et al., 2019	10	Children aged 4-18 years	Schools	Universal/targ eted depression and Anxiety prevention	N= 137 RCT, QE	Anxiety, Depression	<u>Universal/ targeted primary</u> No evidence of reduction in anxiety or depression CBT – reduction in anxiety (weak) + (SMD = - 0.07) <u>Universal Secondary</u> Mindfulness and relaxation interventions +	Little evidence to suggest that school- based interventions are effective for prevention of anxiety or depression. Most studies were at unclear risk of bias for random sequence generation and allocation concealment.

							(SMD = - 0.65) CBT – reduction in anxiety (weak) + (SMD = -0.15) <u>Targeted secondary</u> Exercise interventions: reducing anxiety + (SMD = -0.47)	
Sanchez et al., 2018	9	Elementary school aged children	Schools	Universal/selective/targeted mental health programmes (psychoeducation, emotion regulation, problem-solving and contingency management)	N= 43 RCT, QE	Mental health, Internalising, Externalising, Substance use, Attention problems	All outcomes + (g= 0.39) Externalising + (g= 0.50) Internalising + (g = 0.30) Attention problems + (g = 0.10) Substance use + (g=0.18)	Moderators : <ul style="list-style-type: none"> Service level Targeted + (g = 0.76) Selective + (g = 0.67) Universal + (g = 0.29) Integrated into academic instruction Targeting externalizing problems Incorporates contingency management Implemented multiple times per week
Feiss et al., 2019	11	Children 11- 18 years	Schools	Universal/targeted Stress, Anxiety and Depression prevention programmes Limited to the U.S.	N= 42 RCT, QE (some non-control) **	Stress, Anxiety, Depression	Stress interventions: No effect Anxiety interventions: Reduction in anxiety d= -.070 Depression interventions:	Stress interventions - Targeted programmes more promising than universal Anxiety interventions – higher doses may be needed for universal programmes

							Reduction in depression d=-0.62	Depression interventions - reduction was moderated by a combination of programme type, dose, race, and age group. No differences in anxiety and depression at follow-up.
Johnstone et al., 2018	8	Adolescents >13 years old	Schools	Universal CBT programmes FRIENDS Programme, the Aussie Optimism Programme (AOP), and the Penn Prevention Programme (PPP).	N= 14 RCT's	Depression, Anxiety	Depression: Post-intervention + (g = 0.172) Long-term follow-up + (g = 0.180) Anxiety 0	Moderators: Programme type (FRIENDS more effective than AOP) Programme length (higher numbers of sessions = better effects)
Van Loon et al., 2020	10	Adolescents (10-18 years)	Schools	Universal and targeted programmes targeting psychosocial functioning	N=54 RCT, QE	Psychological stress	Psychological stress + (d = 0.543)	Effects moderated by type of stress and sample, with significant effects reported for school stress and for targeted samples.
Kambara & Kira, 2021	10	Adolescents (14-19 years)	Schools	Universal or selective CBT programmes	N= 15 RCT, QE	Depression	Depressive symptoms + (g = -0.34) Universal 0 - No effect Selective Lower depression + (g = -0.5)	10 studies used universal preventative interventions and 8 studies used selective preventative interventions. No significant effects of gender, intervention intensity, or control type post-intervention. Many studies demonstrated an unclear risk of bias.

							<p>Short-term + ($g = -0.68$)</p> <p>Medium-term 0 - No effect</p>	School-based selective interventions had a moderate effect on lowering depression versus control groups; however, school-based universal interventions had no significant effect.
Werner-Seidler et al., 2017	10	Children and adolescents (5-19 years)	Schools	Universal or targeted school-based psychological prevention programmes	N=81 RCT, QE	Anxiety, Depression	<p>Depression +($g = 0.23$) Anxiety +($g = 0.20$)</p> <p>Small effects were evident after 12-month follow-up for both depression ($g=0.11$) and anxiety ($g=0.13$)</p>	<p>Universal depression prevention programmes had smaller effect sizes at post-test relative to targeted programmes. For anxiety, effect sizes were comparable for universal and targeted programmes.</p> <p>Externally delivered interventions were superior to those delivered by school staff for depression, but not anxiety.</p>
Werner-Seidler et al., 2021	11	Children and adolescents (5-19 years)	Schools	Universal or targeted school-based psychological prevention programmes	N=118 RCT, QE	Anxiety, Depression	<p>Depression +($g = 0.21$)</p> <p>Anxiety +($g = 0.18$)</p> <p>Small effects for both depression and anxiety measured at short-, medium- and long-term follow-up</p>	<p>*Follow-up to the 2017 study</p> <p>Subgroup analyses suggested that targeted prevention programs were associated with significantly greater effect sizes compared to universal programmes for depression.</p> <p>External providers provided some benefit over school-staff delivered programmes only at short-term follow-up (no differences at post-intervention, med- or long-term follow-up).</p>
Mindfulness								
Carsley, Khoury &	10	Adolescents (11-18 years)	Schools	Mindfulness Interventions	N= 24	Mental health and wellbeing	<p>Within group studies Post-test + ($g = 0.23$) Follow-up + ($g = 0.17$)</p>	Interventions delivered during late adolescence (15–18 years) were found to have the greatest effect on mental

Heath, 2018					RCT, QE 2 studies no comparison group		Between groups Post-test + (g = 0.24)	health and well-being at post-test and at follow-up. When trained teachers delivered the program, there were significant effects at follow-up, unlike when the programme was delivered by an outside facilitator.
Vekety et al., 2021	10	Children (3 to 12 years)	Schools	Mindfulness-based interventions	N=21 RCT, QE	Inattentiveness Hyperactive-impulsive behaviour	Reduction in inattentiveness + (g=.36) Reduction in hyperactive-impulsive behaviour + (g= .36)	Positive effect was only significant when teachers rated children's behaviour and nonsignificant when parents and children themselves were the informants. MBIs also showed a moderate effect in reducing inattentiveness and hyperactivity-impulsivity for children at risk for such behaviour + (g=.47) and a small effect for non-at-risk children + (g= .29)
Physical Activity								
Andermo, et al., (2020)	11	Children aged 4-19 years	Schools	Physical activity interventions	N= 31 RCT, QE	Positive and negative mental health outcomes	Positive mental health + (g= 0.41) Well-being + (g = 0.88) Anxiety + (g = 0.35) Resilience + (g= 0.75)	Significant negative or no effect was reported for younger children, whereas significant positive or no effect was reported for adolescents. Risk of publication bias evident for several outcomes but adjustment did not change results.
Cognitive Behavioural Therapy (CBT); Effect Size (ES); Quasi-experimental design (QE); Randomised Controlled Trial (RCT); Social and Emotional learning (SEL)								
Interpreting effect sizes: Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

School-based interventions – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Universal Skills Based							
Dray et al., 2017	10	Children and adolescents (5-18 years)	Schools	Universal, school-based, resilience-focused interventions	N= 57 RCT's	<ul style="list-style-type: none"> - Anxiety symptoms, - Depressive symptoms, - Hyperactivity, conduct problems - Internalizing problems - Externalizing problems - General psychological distress 	<p>Resilience-focused interventions were effective in reducing 4 of 7 outcomes:</p> <ul style="list-style-type: none"> • depressive symptoms • internalising problems • externalising problems • general psychological distress. <p><u>Sub-group analyses: length of follow-up</u> Short-term follow-up, interventions were effective for 2/7 outcomes: depressive symptoms and anxiety symptoms. For long-term follow-up interventions were effective for 1/5 outcomes: internalising problems.</p>
Fenwick-Smith et al., 2018	7	Primary school-aged children (5–12 years).	Schools	Universal school-based mental health promotion programmes	<p>N = 11 Contain a qualitative, quantitative or mixed-methods evaluation</p> <p>2/11 no control</p>	<ul style="list-style-type: none"> - Resilience - Protective factors - Coping behaviour - Emotional adjustment - Problem solving 	<p>Eight studies - Baseline an overarching need for resilience programming among students, including low levels of trust and empathy; problems with emotion control, relationships and help-seeking or reported symptoms.</p> <p>Ten out of eleven studies reported positive outcomes with improvements in student resilience and protective factors, including frequency of use of coping skills, internalising behaviours and self-efficacy at post-assessment.</p> <p>Three studies identified shortcomings in outcomes despite positive results from the overall programme implementation and outcomes.</p>

Higgen et al., 2021	8	Primary or secondary school students exposed to adverse experiences	Schools	Universal school-based mental health interventions	N = 17 All study designs were accepted	Reduction of symptoms of mental health issues, Resilience, Resilience resources (power and control, identity, relationships, material resources, cultural adherence, social justice, cohesion)	15/17 found an increase in resilience. The resilience resource 'power and control' were targeted in every intervention. Not one intervention included all seven resources. Intervention outcomes related mostly to just two of the resources (power and control and identity).
Mackenzie & Williams, 2018	10	Children and adolescents 5–16 years	Schools	Universal school-based mental health & wellbeing interventions	N= 12 RCT/QE, 1 pre-post no control	Mental health, Emotional well-being	Neutral to small effects of universal, school-based interventions in the UK that aim to promote emotional or mental well-being or the prevention of mental health difficulties. Methodological issues such as small sample size, varying course fidelity and lack of randomisation reduced overall study quality. More positive effects found for poorer quality studies trend whereby higher quality studies reported fewer positive effects. More positive effects found for those based in primary schools vs. secondary. Only four studies were rated 'excellent' quality.
Van de Sande et al., 2019	10	Adolescents 11–19 years	Schools	Universal SEL programmes	N= 40 RCT, QE	SEL competencies: <ul style="list-style-type: none">- Self-awareness- Self-management- Social awareness- Relationship management	More than half of the programmes targeted young adolescents aged 11–14, and only a few targeted only older adolescents. A majority of the programmes were administered by trained classroom teachers.

						<ul style="list-style-type: none"> - Responsible decision making <p>Psychosocial health</p>	<p>Most programmes consisted of between 10 and 21 lessons in a single school year, and the lessons lasted between 45 and 90 min.</p> <p>While most programmes targeted four or five of the SEL competencies, many of the included studies did not measure the programmes' effects on all of these targeted competencies:</p> <ul style="list-style-type: none"> - Self-management (17/40) - relationship skills (12/39) - self-awareness (10/36) - social awareness (5/23) - Responsible decision-making (7/26). <p>Of the 14/26 studies that measured programme effects on SEL competencies, one or more of the effects were medium to large.</p> <p>Almost all studies (36/40) reported measures for one or more of the psychosocial health outcomes, that is, depression, anxiety, aggression, and substance use.</p> <p>A majority of the studies (35/40) used student self-reports only.</p> <p>Of the 12 studies that measured follow-up effects, seven of the studies found significant effects.</p>
Prevention interventions							
Waldron et al., 2018	9	Children and adolescents (5-18 years)	Schools	Universal school-based anxiety prevention programmes (CBT)	N=8 RCT's	Anxiety	<p>Three of the eight studies reported greater reductions in anxiety symptomology.</p> <p>Two further studies reported a 'delayed' effect at 12-month follow-up.</p> <p>All five studies that reported prevention effects were evaluating the FRIENDS programme. The final three</p>

							studies which evaluated different programmes reported no immediate or long-term effects.
Ali-Saleh Darawshy, et al., 2020	8	Children and adolescents 8-14 years from low SES communities indirectly exposed to violence	Schools	Prevention programmes for young people exposed to community violence (Targeted)	N= 9 RCT, QE	Internalising and externalising symptoms, Academic achievement, PTSD, Exposure to violence	Most frequent impact on reducing internalizing symptoms and PTSD symptoms with five out of six studies reporting a significant reduction in internalizing symptoms and three out of four studies reporting a significant reduction in PTSD. Academic performance outcomes were rarely examined. However, improvements were found in academic performance in two studies which did assess this outcome.
Mindfulness-based interventions							
Segal et al., 2021	6	Children in low income primary and secondary schools	Schools	Mindfulness-based interventions	N= 7 RCT/QE, 1 pre/post no control	Psychological functioning: - Internalising symptoms - Externalising symptoms - Emotional regulation - Perceived stress - Anxiety - Depression	Findings were inconsistent across studies. Some improvements were reported for externalising and internalising symptoms, emotional regulation, and perceived stress. High enrolment and retention rates across studies. Moderate levels of student-reported satisfaction. Low adherence to at-home practice. Lack of fidelity data.
Peer-led interventions							
King & Fazel, 2021	10	Primary or secondary school students	Schools	Peer-led mental health interventions	N = 11 1 pre/post design the others RCT/QE	Mental health, wellbeing	2/7 studies that looked at peer leaders showed significant improvements in self-esteem and social stress 1/7 showed an increase in guilt. 2/5 studies that examined peer recipient outcomes showed significant improvements in self-confidence and in a quality of life measure.

							<p>1/5 studies showed an increase in learning stress and a decrease in overall mental health scores.</p> <p>Despite the widespread use of peer-led interventions, the evidence base for mental health outcomes is sparse. There appears to be better documented benefits of participation for those who are chosen and trained to be a peer leader, than for peer recipients.</p>
Cognitive Behavioural Therapy (CBT); Effect Size (ES); Quasi-experimental design (QE); Post-traumatic stress disorder (PTSD); Randomised Controlled Trial (RCT); Social and Emotional Learning (SEL)							

Community interventions (Youth) – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other findings
Reangsing et al., 2021a	10	Adolescents with depressive symptoms <i>Aged 10 – 19</i>	-	Mindfulness Interventions (MBI) <i>MBSR (11), MBCT (2) or adapted interventions (16); active controls were not included</i>	N=29 RCT/QE	Depressive symptoms	Depression overall + (g=0.14)	<p>MBIs tended to have greater effects when combined with individual counselling.</p> <p>Greatest improvements were observed for MBSR & 15 – 17 years old (although not significant on both accounts).</p>
Odgers et al., 2020	11	Children & adolescents	Mostly in schools (12) or clinics	Mindfulness-based interventions (MBI)	N=20 RCT	Anxiety	<p>Overall + (d=0.26)</p> <p>Children only + (d=0.41)</p> <p>Adolescents only + (d=0.21)</p>	<p>Significant moderator was study location (Iran d=1.25; Western countries d=0.05).</p> <p>Higher effects with passive controls (d=0.33) than active.</p>

				Mostly MBSR or MBCT interventions				Authors conclude although overall pooled results suggest that MBIs might reduce anxiety symptoms, the estimated effect is likely small & temporary.
Dunning et al., 2019	11	Children & adolescents	Not clear	Mindfulness-based interventions (MBI)	N=33 RCT	Cognition, behaviour & emotion outcomes	Overall + (d=0.19) Depression + (d=0.27) Negative behaviour + (d=0.27) Mindfulness + (d=0.24) Anxiety/stress 0 Social behaviour 0	Interventions with longer duration were associated with fewer negative behaviours across all RCTs. Stronger outcomes observed in the Mindfulness (d=0.42), Depression (d=0.47) & Anxiety/Stress (d=0.18) categories only, when compared to active controls.
Ruiz-Íñiguez et al., 2020	10	Children & adolescents Under 18 years Non-clinical (13) & clinical (5)	-	Mindfulness-based interventions	N=18 RCT/QE	Anxiety	Anxiety 0 (d=0.013)	This meta-analysis did not obtain statistically significant results that could provide conclusions.
Carter et al., 2021	11	Children and young people 14-25 years Clinical and non-clinical	Universities, schools, community	Physical activity <i>Yoga, Tai Chi, aerobic (cycling, running) sports</i> <i>Group and one-to-one formats</i>	N=9 RCT	State anxiety	Anxiety overall + (SMD= -0.54)	Higher effects were observed in clinical populations compared to active & inactive controls

Rodriguez-Ayllon et al., 2019	10	Children & adolescents Aged 6 – 18	Not clear	Physical activity interventions <i>Mind-body, aerobic, resistance, combined, football, exergames & Crossfit</i>	N=12 RCT, QE, 1 pre-post with no control	Psychological ill-health (e.g., depression, anxiety negative affect) & wellbeing (e.g., self-esteem, satisfaction with life, positive affect)	Overall + (ES=0.173) Psychological well-being + (ES=0.189) Psychological ill-being + (ES=0.130)	Programmes with 60 minutes of activity or more significantly improved overall mental health compared to under 60 minutes. Due to small number of studies for children, authors conclude physical activity has a small but significant positive effect for adolescents' mental health.
Baourda et al., 2021	10	Youth Ages 5 – 17 With or at risk of anxiety	Schools, hospitals & other centres	Group psychoeducational interventions Psychoeducational interventions (3), CBT (5), therapeutic play (1), social skills training (1), wellbeing therapy (1) & book-supported intervention (1)	N=12 RCT, QE	Anxiety symptoms	Anxiety + (SMD= -0.47)	No significant moderating effects of treatment duration or primary anxiety diagnosis. Slightly larger SMDs with active parental involvement, although not significant.
Kodsi et al., 2021	10	Young adults Aged 18 – 35	-	Psychological interventions to improve sleep CBT-I/ cognitive refocusing	N=13 RCT	Symptoms of insomnia with at least one secondary outcome:	Combined effect of all interventions + (ES= -0.53) Sleep + (CBT-I [ES= -0.67], psycho-	Mixed results regarding the relative efficacy of face-to-face therapy compared to online.

				techniques (5), relaxation training (5), psychoeducation (3); face-to-face (8), online (4), audio recordings (1)		anxiety, depression or psychological distress	education [ES= -0.44] & relaxation training [ES= -0.36]) CBT-I also showed positive effects for depression (ES= -0.41) & anxiety (ES= -0.35)	Authors conclude CBT-I interventions designed to improve sleep also improve related mental health outcomes.
Salazar de Pablo et al., 2020	10	Young people Under 35 years mean age =15.0 (SD=7.4)	Various	Universal & selective interventions to promote good mental health Universal (62%), selective (38%)	N=276 RCT, QE	Mental health outcomes	Mental health literacy + (ES=0.685) Emotions + (ES=0.541) Self-perceptions & values + (ES=0.490) QoL (ES=0.457) Social skills + (ES=0.371) Attitude towards mental disorders + (ES=0.177) Behaviours, relationships & self-management strategies 0	Psychoeducation was the most effective intervention for promoting mental health literacy. Overall, no significant differences between universal & selective interventions or between children & adolescents versus adults.
Lawrence et al., 2017	10	At-risk children & adolescents	Not clear	Targeted prevention of anxiety Mostly CBT-based interventions (11) in group, family or individual format	N=16 RCTs	Anxiety	Versus inactive control + (SMD= -0.43; small effects retained at 6- and 12-month follow-up; these effects were corroborated with five studies assessing parents' reports)	Fourteen studies included participants with elevated symptoms and anxiety disorder was not ruled out. Therefore, these studies might be reporting results of mixed prevention/ early intervention programmes.

							Versus attention control 0 (SMD= -0.09)	
Bourke et al., 2021	11	Youth Ages 14 – 25	-	Interventions that target multiple modifiable health behaviours i.e., at least two of: physical activity/ sedentary behaviours, nutrition/ diet, sleep, substance use	N=15 RCTs	Depression, Anxiety	Depression 0 (g= -0.16) Anxiety 0 (g= -0.55)	Interventions targeting multiple modifiable health behaviours delivered to groups of young people with an elevated risk of depression had a favourable effect on symptoms of depression compared with controls (g= -0.28) vs. universal interventions, which showed no significant effect. No significant effects on anxiety.
Claro et al., 2021	7	Youth Aged 6 – 19	In-person meetings in the school (9) or extracurricular meetings in community centres, libraries, museums, malls & residences (4)	Mentoring programmes One-to-one only & adult mentors only (i.e., did not include group-based or peer-mentoring interventions)	N=13 (Mix of study designs including some single group pre/post – studies)	Emotional wellbeing Self- or observer-reported	Overall mean effect + (d=0.34) Internalising behaviour + (d= -0.45) Negative affect + (d= -0.20) Self-esteem + (d=0.45)	Mentees themselves may experience slight decreases in negative affect as well as less internalising behaviour.
van Genugten et al., 2017	11	Adolescents 12-18 years	Primary (universal) intervention	Self-regulation change techniques (SRTs)	N=40 RCT, QE	Internalising behaviour, externalising	Primary interventions	Including SRTs in primary prevention interventions did not appear to influence

			<p>s were all school based</p> <p>Secondary (targeted/ indicated) interventions were based in schools (50%) or community centres.</p>	<p>to promote mental wellbeing</p> <p>e.g., interventions that included goal setting, planning, self-monitoring, feedback, coping or relapse prevention</p>		<p>behaviour & self-esteem</p>	<p>Self-esteem & internalising behaviour + (g=0.29 & 0.20)</p> <p>Secondary interventions Self-esteem & internalising behaviour + (g=0.56 in both cases)</p>	<p>effect sizes, & these interventions generally showed lower effect sizes at longer term.</p> <p>Including 'asking for social support' in secondary prevention interventions increased effect sizes for internalising behaviour & including 'monitoring & evaluation' increased effect sizes for self-esteem, and positive outcomes were maintained for longer.</p>
Davaasambu et al., 2020	11	<p>Adolescents in low- & middle-income countries (LMIC)</p> <p>Aged 10 – 19</p>	<p>Schools (19), community centres (8; e.g., refugee campuses, health care centres) & online (1)</p>	<p>Interventions to reduce depression</p> <p>Interventions included CBT (6), IPT (3), microfinance economic interventions (3), memory-based writing sessions (3), physical activity (2), online attention bias therapy (1) & complex psychosocial interventions (11; e.g., CBT</p>	<p>N=28</p> <p>RCT, cluster RCT</p>	<p>Depression</p>	<p>CBT + (SMD= -1.27)</p> <p>Microfinance economic interventions + (SMD= -0.35)</p> <p>IPT + (SMD= -0.23)</p> <p>Complex psychotherapeutic interventions + (SMD= -0.23)</p> <p>Memory-based 0</p> <p>Recreational activities 0</p>	<p>CBT delivered by nurses, social workers & counsellors at community-based settings were more effective treatments in decreasing adolescent depression in LMICs.</p> <p>Adverse effects found in one recreational activities study.</p>

				combined with another modality)				
Beelman et al., 2020	9	Youth <18 years	Not clear	Child social skills training to prevent antisocial behaviour & crime Mostly involving CBT also physical activity & diet, substance abuse & sleep behaviours; mostly group-based	N=113 RCT	Antisocial behaviour & crime	Mean effect + (d=0.25) Delinquency, aggression +	Universal prevention programs on average had lower effects than indicated approaches, demonstrating higher effectiveness for interventions targeting children already showing some antisocial behaviour problems. Child-skills training should be combined with family-oriented & other interventions.
De Mooij et al., 2020	10	Children & adolescents Up to 18 years Nonclinical samples	Schools & community	Social skills training programs (SST) <i>Socio-emotional learning programmes (19) & behaviour-specific programmes</i>	N=97 (60 programmes) RCT, QE	Development of interpersonal & emotional skills	Development of interpersonal skills & emotional skills + (d=0.369)	Psychoeducational components & skill-building components are related to larger SST program effects, granted that the dosage is right (3 – 6 psycho-educational exercises & 11 – 20 skill-building exercises yield significantly larger effect sizes). Psychophysical, or cognitive-emotional components were not associated with positive effects. Interventions delivered by mental health professionals yielded similar results as

								those delivered by teachers or school nurses.
Acceptance & Commitment Therapy (ACT); Cognitive Behavioural Therapy (CBT); Cognitive Behavioural Therapy for Insomnia (CBT-I); Effect size (ES); Interpersonal Therapy (IPT); Mindfulness-based Cognitive Therapy (MBCT); Mindfulness-based Stress Reduction (MBSR); Quasi-experimental (QE); Quality of Life (QoL); Randomised Controlled Trial (RCT); Risk of Bias (ROB); Standard Deviation (SD); Standardised Mean Difference (SMD).								
Interpreting effect sizes: Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

Community interventions (Youth) – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Alves et al., 2021	10	Youth Healthy & untrained	-	High intensity interval training (HIIT)	N=8 RCT	Cognitive function & psychological outcomes (e.g., depression, emotional wellbeing, sleep quality)	Four out of eight studies reported on psychological outcomes & found positive effects for self-concept & psychological wellbeing in boys & girls. HIIT interventions between 4–16 weeks, for 8–30 min/session, at ≥85% maximal heart rate, would provide positive effects on cognitive performance & psychological outcomes in youth.
Malik et al., 2021	10	Young people Aged 14 – 24 years	School, university, community & clinics	Behavioural Activation (BA) as an 'active ingredient' of interventions addressing depression & anxiety	N=23 RCT	Primary: depression Secondary: anxiety	Potential effectiveness of BA in the treatment of depression (compared to waitlist or inactive controls) with insufficient evidence for its use in anxiety. Multicomponent interventions were particularly effective for participants with subthreshold depression (indicated

				i.e., psychological interventions that focus on overt behaviours rather than complex cognitive skills; universal studies were excluded.			interventions) & when delivered in group format. Higher attrition rates in digital interventions.
Wolpert et al., 2019	11	Children & young people Under 25 years old	Self-help or community approaches	Prevention strategies not accompanied by a mental health professional Based on cognitive or behavioural principles (16), physical exercise (10), light therapy (5), dietary supplements (3), massage (2), contact with a dog (1), & online peer support (1)	N=38 RCT, QE	Anxiety (5) & depression (12)	Overall treatment effect was moderate for depression (-0.76) & none for anxiety (-0.21). Light therapy could be effective for seasonal depression. Digital interventions based on attention bias modification are ineffective for anxiety. Mixed evidence was available on the effectiveness of computerised CBT for depression & anxiety, & of physical exercise for depression.

Mygind et al., 2019	9	Children & adolescents Up to 18 years old	Community, school	Immersive nature-experience	N=36 RCT, QE	Mental, physical & social health benefits	<p>Interventions included: non-competitive activities, both sedentary & active, occurring in natural environments removed from everyday environments e.g., expedition or base camp adventure experiences; green educational breaks, education outside the classroom & outdoor free play).</p> <p>60% of studies indicated benefits for mental, physical or social outcomes over controls with 18% as effective as controls.</p> <p>Benefits for psychosocial (e.g., self-esteem & cognitive indicators) were predominant while outcomes such as self-concept, problem solving & mood were more inconclusive.</p>
Cognitive Behavioural Therapy (CBT); Quasi-experimental design (QE); Randomised Controlled Trial (RCT)							

Community interventions (Adults) – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction & magnitude of effects	Other findings
Physical-activity interventions								
Purgato et al., 2021	11	Asylum seeker & migrant populations	Community settings, sport facilities, outpatient or inpatient services, refugee camps, or at home.	Physical activity interventions (PA)	N=18 RCTs (16), CCTs (2)	Mental wellbeing, psychological symptoms (PTSD, depression, anxiety)	<p>General functioning + (SMD= -0.35)</p> <p>Self-efficacy/coping + (SMD= -0.28)</p> <p>Psychological symptoms + (SMD= -0.48)</p>	Interventions included group classes, experiential activities, walking activities, balance & stretching exercises, dance, and lifestyle interventions with diet & behavioural change components.

							<p>Social inclusion/social support 0</p> <p>Mental wellbeing 0</p> <p>Behavioural outcomes 0</p>	<p>Similar findings on psychological outcomes were produced by seven pre-post intervention studies (SMD -0.35) not included in the meta-analysis</p> <p>Outcomes at 1–4 months and over 5 months follow-up showed no significance between intervention & control groups.</p> <p>Analysis of covariates showed no significant moderators.</p>
Zoogman et al., 2019	11	<p>Adults</p> <p>Healthy (13) or clinical/subclinical (25)</p>	Mixed	Yoga-based interventions	<p>N=38</p> <p>RCTs</p>	Anxiety	<p>Anxiety + (d=0.80)</p> <p>Other mental health outcomes + (d=0.55)</p> <p>Physical health + (d=0.45)</p>	<p>No evidence for moderation was found when clinical/subclinical samples were compared to non-clinical samples.</p> <p>High heterogeneity across studies.</p>
Gordon et al., 2017	11	<p>General population</p> <p>Healthy (6) & with physical/mental ill health (10)</p>	Mixed	Resistance Exercise Training (RET)	<p>N=16</p> <p>RCTs</p>	Anxiety	<p>Anxiety + (d=0.31)</p>	<p>Larger effects among healthy participants (d=0.50) compared to participants with physical/mental ill health (d=0.19)</p>

Ng et al., 2019	9	General Population	Unclear	Virtual & augmented reality-enhanced exercise e.g., Xbox 360, Nintendo Wii, and virtual biking, dancing & walking	N=22 RCTs	Physical activity, psychological outcomes, & physical performance	Physical activity + (g=0.83) Physical performance + (g=0.31) Psychological outcomes 0	Psychological outcomes (e.g., enjoyment, calmness, energy, tension) were assessed in six studies.
Mindfulness-based interventions								
Berry et al., 2020	10	General population	College, community	Mindfulness training without explicit ethics-based instructions (i.e., secularised mindfulness interventions)	N=23 RCTs (17 unpublished)	Pro-social behaviour	Pro-sociality overall + (g=0.426)	Effect sizes were stronger in student populations. Authors conclude that the effects of mindful attention on overt pro-sociality is not limited to explicit training in ethical concepts.
Donald et al., 2020	11	General population	Unclear	Mindfulness grounded in self-determination theory	N=14 RCT	Types of motivation (e.g., autonomous, controlled, identified, intrinsic etc.)	Medium-sized pooled positive effect on autonomous motivation when RCTs were isolated: Overall + (d=0.47)	Consistent support for mindfulness predicting more autonomous forms of motivation.

							Intrinsic motivation + (d=0.54) Identified motivation + (d=0.20)	
Galante et al., 2021	11	Adults	Community	Mindfulness-based programmes (MBPs) In-person only	N=136 RCTs (129), cluster-RCTs (7)	Anxiety, depression, psychological distress & mental well-being	Compared to no intervention: Anxiety + (SMD= -0.56) Depression + (SMD= -0.53) Distress + (SMD= -0.45) Wellbeing + (SMD=0.33) Compared with non-specific active controls: Depression + (SMD= -0.46) Anxiety + (SMD= -0.47) Distress 0 Compared with specific active control conditions, there is no statistically significant evidence of MBPs' superiority.	Only effects on distress remained when higher-risk trials were excluded. MBPs targeted at higher-risk populations had larger effects than universal MBPs. Only the effects of MBPs relative to passive controls on psychological distress remained when trials at highest risk of bias were excluded.
Teoh et al, 2021	11	Adults & students	College, community	Mindfulness to alleviate loneliness Mostly group based MBSR, CBCT & MBCT	N=7 RCTs	Loneliness	Participants with no mental health conditions: Loneliness+ (MD= -6.33) Participants with mental health conditions found no significant effects.	Younger populations showed larger effects than adults or elderly.

Golden et al., 2020	9	Adults Aged 18 or over	College, community	Mindfulness-based programmes (MBPs) on self-compassion Interventions were mostly MBSR- or MBCT-based	N=22 RCT	Self-compassion	Self-compassion + (g=0.60)	Improvements in self-compassion was not always consistent with improvements in depression or anxiety. No differences found for any of the moderators tested.
Schumer et al., 2018	10	General population	College, community	Brief mindfulness training for negative affectivity	N=63 RCT	Negative affectivity	Negative affectivity compared to control programs + (g=0.21) When accounting for publication bias, the overall effect size on negative affectivity was significantly reduced (g=0.04)	Adult community populations (g=0.40) had larger effects compared to college students (g=0.14). Duration of intervention did not appear to moderate effects.
Cognitively Based Compassion Training (CBCT); Clinical Controlled Trials (CCT); Cognitive Behavioural Therapy (CBT); Effect size (ES); Quasi-experimental design (QE); Interpersonal Therapy (IPT); Mindfulness-based Stress Reduction (MBSR); Mindfulness-based Cognitive Therapy (MBCT); Mean difference in score (MD); Randomised Controlled Trial (RCT); Standardised Mean Difference (SMD)								
<u>Interpreting effect sizes:</u> Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

Community interventions (Adults) – Systematic reviews

Author, Year	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Moore et al., 2018	10	Adults (16-64 years)	Neighbourhoods in high-income countries	Built environment interventions Urban regeneration (6), improving green infrastructure (6) & transport infrastructure modification (2)	N=14 RCTs	Mental health & well-being, QoL, social inclusion/isolation, social capital, fear of crime	No strong evidence of an effect on mental health outcomes (weak evidence of small beneficial effects compared to controls) & fear of crime. There was little evidence of an effect of urban regeneration interventions on QoL & no effect on social isolation/inclusion outcomes. Improving green infrastructure showed small improvements on QoL. Authors express concern regarding the methods of measuring success of built environment interventions and believe backgrounds against which such outcomes are measured may be too nuanced and complex for studies to take into account.
Moore et al., 2017	10	Unemployed general population	Community	Interventions to reduce the impact of unemployment & economic hardship	N=11 RCTs	Mental health outcomes & employment status.	'Job-club' interventions may be effective in reducing depressive symptoms in unemployed people, particularly those at high risk of depression, although findings were inconsistent across studies.

				'Job-clubs' (5), CBT (2), emotional competency training (1), expressive writing (1), guided imagery (1), debt advice (1)			Evidence for CBT-type interventions is mixed; further trials are needed. Limited number of studies on interventions using other approaches to draw conclusions on effectiveness.
Flores et al., 2018	9	Adult general population	Any	Social capital interventions	N=7 RCT, QE	Mental health Social capital components: cognitive (perceived quality of an individual's social relationships), structural (nature and intensity of an individual's participation in community networks)	Variety of intervention approaches, including community engagement and educative interventions, cognitive processing therapy and sociotherapy for trauma survivors and neighbourhood projects. Most studies reported promising findings regarding improvement in social capital and mental health outcomes, however, little evidence of long-term outcomes.
Cognitive Behavioral Therapy (CBT); Quasi-experimental (QE); Quality of Life (QoL); Randomised Controlled Trial (RCT)							

Community interventions (Older adults) – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other
Chen et al., 2021	11	Women who are menopausal No age limit	Community and health services	Mindfulness- based interventions (MBI)	N=5 RCTs	QoL, menopausal symptoms.	Overall QoL + (SMD= - 0.48) Psychological subscale of QoL 0 (SMD= -0.54)	Most programmes were 8 weeks long with 2–2.5 hrs of classes per week & assigned 30–60 min of home practice per day.

				MBSR, MBCT or MRTI			Sexual subscale of QoL 0	MBI class time or home practice minutes do not appear to be relevant to the improvement of QoL & menopausal symptoms.
Reangsing et al., 2021b	10	Older adults 64-82 years	Mix of educational, clinical/health, community and home/private settings	Mindfulness meditation interventions (MMIs) MBSR (10), MBCT (2) or adaptive mindfulness interventions (7)	N=19 RCTs, QE	Depression outcome measures	Depression + (ES=0.65) Researchers who computed a priori power analysis (an indicator of quality), showed greater effects on depression ($g=1.0$) than without power analysis ($g=0.35$), perhaps due to larger samples in these studies.	Moderators No difference was found across the 3 different types of MMIs but those with guided meditation (in-person, digital or both) reduced depression (0.91) more than MMIs without (0.42). Less than 5 weeks of structured MMIs showed greater improvement in depression (1.47) than longer periods (0.55), however, only 2 studies included shorter than 5 weeks. Standard duration is 8 weeks. Long-term effects were not measured. Population groups from Asian countries showed greater improvements in depression (1.28) compared to Europeans (0.59) & North Americans (0.32).
Weber et al., 2020	11	Older adults Mean age	Mostly community (32/37)	Mind-body interventions (MBIs) with	N=37 RCTs	QoL, depression symptoms,	QoL + ($g=0.34$; TCQ was more significant [$g=0.42$]).	A significant larger effect size for QoL and depressive symptoms with increasing

		(72.2 years) Mostly without mental disorders		meditative movements Particularly Tai Chi and Qigong (TCQ) & Yoga/Pilates (YP); all group-based		fear of falling & sleep quality	Depression + (g=0.25; YP was more significant [g=0.39]). Fear of falling + (TCQ: g=0.79, YP: g=0.58). Sleep quality + (g=0.47; similar effect sizes for both TCQ & YP). Psychological Functioning + (g=0.39; only TCQ showed effect) Social Functioning + (g=0.31, only TCQ showed effect)	training frequency was found for TCQ (p=0.03; p=0.004) favouring those who exercised 3 or more times per week compared to 1-2 times per week. TCQ seem to be more effective for improving psychological aspects of quality of life than YP.
Noble et al, 2021	11	Older adults Average age of 64-84	Community	Formal education or learning Creative arts (n= 5), cognitive training (n = 9), computer and internet use (n= 6), health promotion and education (n = 3), literacy (n = 1) and formal education courses (n = 8).	N=10 RCTs & QEs	Wellbeing & cognition	Cognitive functioning + (MD=0.40) Satisfaction with life + (MD=0.44) Objective health + (MD=0.22) Functional skills + (MD=0.16)	High heterogeneity in included studies. Participation in later-life learning contributes to increased wellbeing and quality of life, healthy cognitive function, self-dependency, and a sense of belonging.

Sivaramakrishnan et al., 2019	11	Older adults Mean age 61-84 Not recruited on the basis of a specific disease/condition.	Settings for yoga classes not specified	Yoga Hatha (4 studies), Chair (3), Iyengar (3), Silver (2), Balance, Thai, 'Easy Does It', British Wheel of Yoga 'Gentle Years' (each, 1) Duration of 4 - 28 weeks	N=17 RCTs	HRQoL	Yoga vs inactive controls: Depression + (ES = 0.64) Perceived mental health + (ES = 0.6) Sleep quality + (ES = 0.65) Vitality + (ES = 0.31) Fear of falls 0 Social health 0 Yoga vs. active controls: Depression + (ES = 0.54) Anxiety 0 Perceived mental health 0	Yoga was found to be as good as the activity undertaken by active controls in improving outcomes such as mobility, walking speed, balance, anxiety and perceived mental health. The yoga group was never significantly worse than the active or inactive group for any of the outcomes. With high attendance rates for class-based sessions, yoga is a feasible intervention that can be recommended to older adults as an activity that improves physical and mental wellbeing. All seventeen studies assessed HRQoL measures.
Martínez-Domínguez et al., 2018	10	Women with mild to moderate symptoms of anxiety Midlife & older (40+)	Settings not specified	Programmed exercise Mid-term exercise intervention (MTEI): 12 weeks to 4 months; Long-term exercise	N=10 RCTs	Anxiety symptoms .	MTEI of low or moderate intensity & in the short term + (SMD= -0.42). LTEI + (SMD= -0.03) Sub-grouped moderate vs low intensity showed no significant difference.	Authors conclude those with anxiety symptoms seem to lose the benefit of programmed exercise with time. High heterogeneity in MTEI studies, low heterogeneity in LTEI studies.

				intervention (LTEI): 6 to 14 months. Exercise intensity: low (walking, yoga & progressive exercise) or moderate (aerobic exercise & cardiovascular training).				Small sample sizes, issues with standardisation & objective assessment of type & intensity of physical activity performed in interventions.
Nigdelis, et al., 2018	10	Healthy women 47-72 years	Community	Programmed exercise Mid-term Exercise Intervention (MTEI): mean duration 6 months; Long-term Exercise Intervention (LTEI): mean duration 12 months.	N=6 RCTs	Perceived stress Included self-report questionnaires	MTEIs & LTEIs did not change perceived stress in 5 out of 6 RCTs (SMD= -0.17 & SMD= -0.02, respectively)	No evidence that programmed exercise of low to moderate intensity & applied over a period of 6-12 months, can modify perceived stress in middle-aged and older women. Heterogeneity considerations (age and type & intensity of programmed exercise).
Hart & Buck, 2019	8	Older adults 50+	Settings not specified	Resistance Training Any regimented program that works large muscle groups	N=16 RCTs	HRQoL	Large positive effect on HRQoL Mental health + (ES=0.64 95% CI [0.30-0.99, I ² =79.7%)	Moderators – Interventions with both genders: greater effect on mental health (0.85); females only: greater effect on social functioning (0.91); intervention length had significant & positive relationship with effects of

				by using either concentric, eccentric, or isometric muscle actions			Moderate effect on vitality (ES=0.39 95% CI [0.15-0.6]) Social functioning 0 Emotional role functioning 0	resistance training on emotional role functioning (slope=0.07). Eight of the sixteen studies included mental health as an outcome. Authors conclude resistance training has a robust effect on HRQoL in older adults.
Lin et al., 2021	11	Older adults 60+	Conducted in parks/ gardens, homes, nursing homes, hospitals & care units.	Horticultural Therapy	N=4 RCTs	Psychological health (depression, anxiety, social functioning, wellbeing, QoL) Heterogeneity in outcomes & instruments	QoL + (SMD=0.26) Narrative Analysis: Happiness + Anxiety 0 Stress 0 Self-efficacy 0 Agitation 0 Mixed results for wellbeing, depression, social wellbeing	Structured therapeutic regimens (set frequencies & durations) as well as unstructured. Implemented by horticulture therapist (3), nurses, master gardeners or experienced instructors (5). 3 of the 4 studies included in the meta-analysis reported no adverse effects.
Hudes et al., 2019	9	Healthy older adults with normal age-related memory changes Over 50	Community	Memory-strategy training (association, spaced retrieval, visualization etc.) In-person, group strategies	N=15 RCTs	Cognitive function, psychological wellbeing (e.g., depression, loneliness, negative & positive affect), QoL	Wellbeing + (d=0.39) QoL + (d=0.39)	Six out of fifteen studies included a measurement of psychological wellbeing and a further four included a measurement of QoL. Twelve of the 18 studies were multimodal interventions that included supportive elements in addition to memory skills training.

Lim et al., 2020	9	Older adults 65 years & older	Community-dwelling delivered in participants' homes Duration of intervention ranged widely from 3 - 12 months	Environmental modification Interventions included task simplification, removal, repair & education regarding environmental factors, all of which aimed to prevent falling & improve daily life at home.	N=16 RCT, QE	Activities of daily living, social participation & QoL	Activities of daily living + (SMD=0.47) QoL 0 Social Participation 0	Occupational therapists took part in most of the interventions in the studies, & other multidimensional approaches were conducted by nurses & physical therapists. Environmental modifications considering the functional changes due to ageing can contribute to successful ageing of older adults by performing activities of daily living.
Wong et al., 2018	8	Older adults Mean age 71-86	Community-dwelling	Complex interventions supporting self-care <i>Interventions containing a combination of several interacting components that include at least two of the following: individual assessment, care planning, provision of information</i>	N=22 RCTs	Positive aspects (self-rated health, activities of daily life & QoL) Negative aspects (health service utilisation, falls & depression)	Self-rated health + (SMD 0.09) Mental health subscale of QoL + (SMD 0.44) Incidence of falls + (OR 0.60) Depression 0 Activities of daily living 0 Instrumental activities of daily living 0 Quality of life 0 Fear of falling 0	Intervention channels – Home visits only (11), home visits & telephone follow-up (7), home visits & group training (2), group training only (1), visits at community centre (1); all were professionally led (nurse, multi-disciplinary etc.). Duration 6 months – 2 years.

							Reduction in health service utilisation 0	
Effect size (ES); Health-Related Quality of Life (HRQoL); Mean Difference in scores (MD); Mindfulness-based Cognitive Therapy (MBCT); Mindfulness-based Stress Reduction (MBSR); Mindfulness & Relaxation Training for Insomnia (MRTI); Quality of Life (QoL); Odds Ratio (OR); Randomised Controlled Trial (RCT); Standardised Mean Difference (SMD).								
<u>Interpreting effect sizes:</u> Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

Community interventions (Older Adults) – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Coll-Planas et al., 2017	9	Older adults Mean age 70-80	Mostly in community settings Four studies applied a settings approach (i.e., involving the complete institution), but no interventions were community-wide	Social capital interventions Programmes were mainly based on social support (e.g., support groups, peer support), social activities, befriending schemes).	N=36 RCTs	Subjective outcomes: QoL, well-being, self-perceived health, mood (including depressive symptoms & anxiety) & loneliness Objective outcomes: mortality	Trials reported positive effects in different contexts, participants' characteristics and intervention designs and across a range of outcomes. Overall, mixed effects were found on QoL, wellbeing & self-perceived health. Interventions were generally ineffective on loneliness, mood and mortality. High risk of bias in most studies. Eight high quality studies reported favourable impacts on QoL, well-being, and self-perceived health.
Niclasen et al., 2019	9	Older adults 65 years & older	Community-dwelling adults (40), homecare (3), living in elderly homes (10)	All mental health interventions Lifestyle (1), physical activity (23), cognitive	N=53 RCTs .	Physical, psychological & cognitive functioning	No single intervention could be recommended for the promotion of mental health among older adults.

		Mainly well-educated women		functioning (6), psychologically oriented (14), socially oriented interventions (6), restructuring home care (3)			<p>One study reported negative depression & physical functioning consequences for participants with deteriorated cognitive function.</p> <p>Factors responsible for positive effects:</p> <p>Participants should be highly motivated & compliance should be maximised. Interventions should meet individual preferences & needs of participants (e.g., individual-, group- or internet-based).</p> <p>Interventions should be continuously adjusted to participants' physical, cognitive & mental levels of functioning (e.g., if content is too intense/demanding participants lose motivation; extensive interventions needed for high level of functioning, simple interventions needed for low level functioning).</p> <p>Tendency for social elements/group-based to have greater effect.</p> <p>Short duration or fewer meetings is less effective.</p> <p>Continuous supervision & feedback from healthcare professionals is central to success (e.g., home/telephone visits).</p> <p>Healthcare professionals/ nursing home employees should be actively involved in planned activities in implementation.</p>
Tong et al., 2021	10	Older adults 50 and over	Range of intervention sites, mostly in the community	Interventions for social isolation and loneliness	N=24	Social isolation (primary) & loneliness (secondary)	Interventions with a group component could be helpful for alleviating social isolation problems in older adults.

		No mental illness or cognitive impairment.		<p>Group (n=14: activities=8, social support training=5, remote=1)</p> <p>Individual (n=6: remote=4, face-to-face interviews=2)</p> <p>Mixed/both (n=4)</p>			<p>Significant heterogeneity made it difficult to make recommendations on specific interventions, however, better effects are observed when:</p> <p>Participants are accurately targeted & older persons are isolated as a single intervention target</p> <p>Interventions set in social/public places</p> <p>Older people are active participants</p> <p>Professionals rather than teachers/students conduct intervention</p>
Ollevier et al., 2020	9	<p>Healthy older adults</p> <p>Average age 68 years</p> <p>Mostly women</p>	Community/digital	Technology interventions to support ageing in-place	N=7 RCTs	Anxiety, HRQoL, loneliness, etc.	<p>Accessible computer system/ communication platform reported positive effects on loneliness, perceived social support, and wellbeing.</p> <p>Emergency assistance technologies (pendant/bracelet system) reported improvements in overall mental health but not on anxiety, depression or social isolation.</p> <p>Physical exercise technologies (pedometer, online video platforms) reported beneficial effects on increased steps per day and the mental component of HRQoL.</p> <p>Mental wellbeing technologies (bio/neurofeedback) reported improvements on some but not all aspects of cognitive functioning.</p> <p>Studies revealed positive attitudes held by older people toward technological interventions.</p> <p>Positive effects faded away with time, which could be attributed to the novelty effect of</p>

							<p>technology. Therefore, intrinsic motivation/engagement should be built into technology interventions aimed at improving health & wellbeing of users.</p> <p>Patient-centred approaches are important (e.g., education, training, guidance, a close follow-up & co-design with participant).</p>
Chobe et al., 2020	9	Older adults Average age 67	Community (9) or residential care settings (4)	Yoga Hatha (3), Chair, Integrated, Kundalini, Kirtankriya, Kundalini, Trataka, Laughter & Elderly-specific (3) Yoga	N=13 RCTs	Cognitive & psychological effects	<p>12/13 studies reported positive effects at least on one cognitive/psychological outcome measure.</p> <p>Positive psychological effects were reported on anger, depression, stress, mood and anxiety in some but not across all the 13 studies included.</p> <p>Intervention & session duration & frequency varied substantially.</p> <p>Two out of thirteen studies reported adverse effects in relation to dizziness & groin muscle strain.</p>
Valdés-Badilla et al., 2021	10	Functionally independent older adults Mean age of 70 years	Community	Olympic combat sports (OCS) Boxing, fencing, judo, karate, taekwondo, wrestling	N=12 RCTs	Physical-functional, physiological &/or psycho-emotional health	<p>QoL perception + (via SF-12 in 2 studies)</p> <p>Individual studies reported positive effects on emotional wellbeing, anxiety, and stress tolerance.</p> <p>One study found no significant changes in psychological variables.</p> <p>Intervention & session duration, frequency & intensity varied substantially.</p> <p>Only five studies out of twelve assessed psycho-emotional outcomes.</p>
Health-Related Quality of Life (HRQoL); Quality of Life (QoL); Randomised Controlled Trial (RCT)							

Workplace interventions – Meta-analyses

Author Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other
Mindfulness/meditation interventions								
Vonderlin et al., 2020	10	Employees	Workplace	Mindfulness	N=56 RCT	Stress, mental health and well-being, job- satisfaction	Perceived stress + (g=-0.66) Mindfulness+ (g=0.44) Wellbeing and life satisfaction + (g=0.68) Work engagement + (g=0.53) Job satisfaction + (g=0.48) Productivity + (g=0.35) Results were maintained in follow-up assessments ≤ 12 weeks.	Heterogeneity among primary studies was not explained consistently by program or participant characteristics in the exploratory moderator analyses. Results on work engagement and productivity were limited by low numbers of primary studies, with outliers among their effect sizes. Larger effect sizes reported for highly educated participants, studies with more male participants or those working in the financial sector.
Bartlett et al., 2019	11	Employees	Workplace	Mindfulness	N=23 RCT	Stress Anxiety Depression Wellbeing Mindfulness Work performance	Mindfulness (g = 0.45) Stress (g = 0.56) Anxiety (g = 0.62) Psychological distress (g = 0.69), Well-being (g = 0.46) Sleep (g = 0.26)	Intervention effects maintained up to 12-month follow-up. Heterogeneity in study designs and interventions reported. No conclusions could be drawn from pooled data for burnout due to ambivalence in results, for depression due to publication bias,

								or for work performance due to insufficient data.
Lomas et al., 2019	10	Employees	Workplace	Mindfulness	N=35 RCT	Wellbeing-related outcomes	<p>Deficit based outcomes: Stress (SMD = -0.57), Anxiety (SMD = -0.57), Distress (SMD = -0.56), Depression (SMD = -0.48), Burnout (SMD = -0.36),</p> <p>Asset-based outcomes: Health (SMD = 0.63), job Performance (SMD = 0.43), Compassion and empathy (SMD = 0.42), Mindfulness (SMD = 0.39), Positive wellbeing (SMD = 0.36), Emotional regulation 0</p>	Quality of the studies was inconsistent, suggesting more high-quality randomised controlled trials are needed.
Suleiman-Martos et al., 2020	10	Nurses	Workplace	Mindfulness	N=17 RCT, QE	Burnout related outcomes	<p>Emotional exhaustion + (Mean difference 1.32 (95% CI: 19.41—6.78)</p> <p>Depersonalisation + (Mean difference 1.91 (95% CI: -4.50-0.68)</p> <p>Personal accomplishment + (Mean difference 2.12 (95% CI: -9.91-14.14)</p>	<p>Participants mainly women (87-100% of sample across studies)</p> <p>Only two studies with overall 90 participants were included in the meta-analysis</p>
Spinelli et al., 2019	10	Healthcare professionals and trainees	Workplace	Mindfulness	N=38 RCT	Mental health, wellbeing, physical health	<p>Anxiety + (g=0.47) Depression+ g=0.41) Psychological distress + (g=0.46) Stress + (g=0.52) Burnout + (g=0.26) Well-being + (g=0.32)</p>	<p>High/unclear risk of bias in all studies and heterogeneity in findings across studies.</p> <p>Outcomes positively moderated by age and proportion of female participants.</p>

							Self-compassion + (g=0.35) Mindfulness (g=0.35) Physical health 0 Performance 0	
Kang & Myung, 2021	9	Nurses	Workplace	Mindfulness	N=9 RCT	Psychological distress (depression, anxiety, stress) and wellbeing (resilience, wellbeing, QoL), job related outcomes	Psychological distress + (SMD=-0.47) Psychological wellbeing + (SMD=0.28) Job related outcomes 0	Only one of the studies rated as high quality. Publication bias not assessed.
Klingbeil & Renshaw, 2018	8	Teachers	Workplace	Mindfulness	N=29 RCT	Mental health and wellbeing	Overall treatment effect + (g=0.601) Mindfulness + (g=0.694) Psychological wellbeing + (g=0.431) Psychological distress + (g=0.551) Physiological indicators 0 Classroom climate and teacher practices 0	Evidence of positive publication bias. Over reliance on self-report measures, limited use of active control conditions and lack of reporting on implementation fidelity common across studies.
Psychological interventions for stress, depression and anxiety								
Bellón et al., 2019	11	Employees	Workplace	Psychological and educational depression prevention interventions	N=3 RCTs	Depression	Depression + (OR 0.251)	Quality of evidence low Interventions based on social cognitive theory, CBT and ACT

Nigatu et al. 2019	11	Employees at risk of depression	Workplace	Indicated prevention interventions	N=16 RCT	Depression	CBT: Depression + (SMD= -0.44) Non-CBT: Depression + (SMD= -0.32)	Eight of 16 studies reported significant effects for workplace preventive interventions targeting depressive symptoms in which six were cognitive behavioural therapy (CBT)-based interventions and two were non-CBT-based interventions.
Petrie et al., 2019	11	Physicians	Workplace	Interventions for reducing symptoms of common mental health disorders and suicidality	N=8 RCT, QE	Depression, Anxiety, Psychological distress	Depression + (SMD 0.53, p=0.0019) Anxiety + (SMD 0.71, p=0.035) Psychological distress + (SMD 0.53, p<0.0001) Overall psychological symptoms + (SMD 0.62, p<0.0001)	Variety of interventions included, e.g. mindfulness CBT, relational support and coping mechanisms approach. Stronger effects for group-based interventions and those based on mindfulness or CBT. Only one study examined anxiety as an outcome.
Organisational interventions								
Knight et al., 2017	11	Employees/ organisations	Workplace	Work engagement interventions	N=20 RCT, QE	Work engagement	Work engagement + (g=0.29)	High heterogeneity between studies, and success of implementation varied. Intervention type did not moderate outcomes. Mode of delivery had a significant moderating effect, with group interventions being more effective than interventions using other formats of delivery.
Digital interventions								
Phillips et al., 2019	11	Employees	Workplace	e-mental health	N=34 RCT	Mental health	Stress + (g=0.54) Insomnia + (g=0.70) Burnout + (g=0.51) Depression + (g=0.30) Anxiety + (g=0.34) Well-being + (g=0.35)	The majority of interventions primarily addressed stress (18), ten studies addressed depression, seven addressed insomnia and mental well-being, five focused on reducing alcohol consumption, and two

							<p>Mindfulness + (g=0.42)</p> <p>Alcohol intake 0</p>	<p>studies were dedicated to burnout reduction.</p> <p>More research is required to understand which factors contribute to the variation in effectiveness of particular interventions depending on the mental health area and characteristics of participants and interventions</p> <p>High attrition rates reported (>20%)</p> <p>The presence of guidance and higher quality studies were associated with significantly better outcomes. Problem-solving therapy showed significantly higher treatment effects for stress, depression, anxiety and burnout.</p>
Carolan et al., 2017	10	Employees	Workplace	Web-based psychological interventions	N=21 RCT	Psychological wellbeing Work effectiveness	<p>Psychological well-being + (g=0.37)</p> <p>Work effectiveness + (g=0.25)</p>	<p>No statistically significant differences were found on either outcome between studies using cognitive behavioural therapy (CBT) approaches compared with other psychological approaches, offering guidance compared with self-guidance, or recruiting from a targeted workplace population compared with a universal workplace population.</p> <p>Interventions that are delivered over a shorter time frame (6 to 7 weeks), utilize secondary modalities</p>

								for delivering the interventions and engaging users (i.e. emails and text messages), and use elements of persuasive technology, may achieve greater engagement and adherence.
Stratton et al., 2017	10	Employees	Workplace	eHealth	N=23 RCT, QE	Depression, anxiety and stress symptoms	Overall effect at post intervention + (g = 0.24) and follow up + (g = 0.23) Differential effects by intervention type: Mindfulness (g = 0.60), CBT (g = 0.15), Stress management (g = 0.17)	Stress management interventions differed by whether delivered to universal or targeted groups with a moderately large effect size at both post-intervention (g = 0.64, 95% CI 0.54 to 0.85) and follow-up (g = 0.69, 95% CI 0.06 to 1.33) in targeted groups, but no effect in unselected groups.
Other								
Gayed et al., 2018	11	Managers	Workplace	Mental health training for managers	N=10 QE	Mental health literacy, stigma, mental health support, employee mental health	Managers' mental health knowledge + (SMD=0.73) Non-stigmatising attitudes towards mental health + (SMD=0.36) Behaviour in supporting employees experiencing mental health problems (SMD=0.59)	No significant effects detected for the small number of studies evaluating psychological symptoms in employees (p=0.28). An increase in collection of employee level data is required.
Oliveira et al., 2021	8	Teachers	Workplace	Social and emotional learning interventions	N=13 RCT, QE	Burnout	Emotional exhaustion + (g=-0.37) Personal accomplishment + (g=0.45) Depersonalisation 0	Interventions that are tailored to the specific needs of the participants and are over three months duration may be more likely to be effective. Interventions that were solely focused on teachers' interpersonal skills regarding classroom management and student-teacher relationship had no significant

								effect on levels of burnout. Therefore, interventions for teachers have to also focus on intrapersonal skills.
De Diego-Cordero et al., 2021	10	Employees	Workplace	Spiritual interventions (yoga, spiritual meditation, Tai Chi, religious activities, Reiki and Qigong, and spiritual workshops)	N=6 RCT	General health, stress	Stress + (SMD= -2.31)	High heterogeneity and limited number of studies may hinder more robust conclusions.
Sakuraya et al., 2020	11	Employees	Workplace	Interventions for subjective wellbeing	N=31 RCT	Subjective wellbeing	Subjective wellbeing + (SMD = 0.51)	Interventions categorised to: physical activity, ergonomics, psychological, environmental, multicomponent intervention, and others. The pooled effects of mindfulness, CBT, and other psychological interventions were significantly positive ($p < 0.05$). The effects of physical activity, environmental and multicomponent interventions were not significant ($p = 0.10, 0.41$, and 0.77 , respectively).
Lupsa et al., 2020	10	Employees	Workplace	Interventions to improve psychological capital	N=41 RCT, QE	Components of psychological capital, wellbeing, performance	Psychological capital overall + (d=0.34) Developing psychological capital + (d=0.26) Hope + (d=0.22) Self-efficacy + (d=0.37)	Interventions included: Positive psychology (n=13), PsyCap (n=6), JD-R (interventions to improve the balance between job demands and personal resources; n=4), stress management (n=8), other (incl. mindfulness, self-development

							<p>Optimism + (d=0.36) Resilience + (d=0.49)</p> <p>coaching, career skills training, coaching leadership, self-management etc; n=10).</p> <p>Sub-analyses revealed that all but JD-R interventions had a significant overall impact on psychological capital.</p> <p>Stress management and other interventions had a moderate effect on self-efficacy and small effect on resilience.</p> <p>Positive psychology interventions had a small effect on self-efficacy, optimism and hope.</p> <p>Other interventions had a moderate effect on self-efficacy and strong effect on resilience.</p>
Quasi-experimental design (QE); Odds Ratio (OR); Randomised Controlled Trial (RCT)							
<p>Interpreting effect sizes: Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES: 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect</p>							

Workplace interventions – Systematic reviews

Author Year of publication	Quality rating	Population	Setting	Type of intervention	Studies included N Design	Outcomes measured	Findings
Mindfulness, meditation and mind-body interventions							
Janssen et al., 2018	10	Employees	Workplace	Mindfulness (MBSR, MBCT)	N=23 RCT, QE	Mental health	The strongest outcomes were reduced levels of emotional exhaustion (a dimension of burnout), stress,

							<p>psychological distress, depression, anxiety, and occupational stress. Improvements were found in terms of mindfulness, personal accomplishment (a dimension of burnout), (occupational) self-compassion, quality of sleep, and relaxation.</p> <p>Of the 23 studies, 2 were of high methodological quality, 15 were of medium quality and 6 were of low quality. Only one study examined MBCT.</p>
Jung et al., 2021	10	Nurses	Workplace	<p>Mind-body interventions</p> <p>(Mindfulness, yoga, music, relaxation)</p>	<p>N=17</p> <p>RCT</p>	Burnout	<p>Little evidence that mindfulness or yoga improve burnout in nurses. Lack of studies examining the impact of music therapy and relaxation on burnout in nurses.</p> <p>Most mind-body interventions show beneficial impact on stress, however, low quality of primary studies inhibits robust conclusions to be made.</p>
Psychological interventions for stress, depression and anxiety							
Ihara et al., 2021	8	Employees	Workplace	Group CBT	<p>N=10</p> <p>RCT</p>	Mental health and work performance	<p>Eight studies showed that group CBT-based interventions improved aspects of mental health; ten studies demonstrated that group CBT-based interventions influenced some aspects of work performance-related factors. Overall, the reported effect sizes varied widely, from small to large.</p>
Wan Mohd Yunus et al., 2018	10	Employees	Workplace	<p>Universal (8) and targeted (14) depression prevention</p>	<p>N=22</p> <p>RCT</p>	Depression	<p>The cognitive behavioural therapy (CBT) approach is the most frequently used in the workplace, while interventions that combine different therapeutic approaches showed the most promising results.</p> <p>A universal intervention in the workplace that combines CBT and coping flexibility</p>

							<p>recorded the highest effect size ($d=1.45$ at 4 months' follow-up).</p> <p>Interventions included: CBT, meditation/relaxation, combined</p> <p>Most interventions were delivered in group format and showed low attrition rates compared with other delivery formats. Although all studies reviewed were RCTs, the quality of reporting was low.</p>
Velana & Rinkenauer, 2021	8	Nurses	Workplace	Individual-level interventions for reducing stress and improving coping	N=27 RCT	Stress	<p>Some indication that technology-delivered interventions with relaxation and stress-management interventions with CBT components might be effective in decreasing stress and improving well-being among nurses.</p> <p>Various types of interventions included in the review, with digital stress-management, mindfulness and cognitive behavioural interventions being most common.</p>
Alkhawaldeh et al., 2019	10	Nurses	Workplace	Stress management interventions (Yoga, stress management (n=3), CBT, mindfulness (n=3), massage, relaxation)	N=10 RCT	Occupational stress	<p>All but three intervention studies reported significant effects on stress. The interventions that did not show significant outcomes were based on relaxation, mindfulness and psycho-oncology.</p> <p>High heterogeneity in interventions and small samples across studies.</p>

Wild et al., 2020	10	First responders (police, ambulance, fire, and search and rescue officers)	Workplace	Interventions to improve resilience to stress (Physical exercise, psychological interventions, stress management, self-regulation, debriefing after a traumatic event)	N=13 RCT, QE	Physical and mental health (various measures)	<p>Heterogeneity in interventions and high/unclear bias across studies.</p> <p>Largest effects were seen for interventions that targeted modifiable risk factors for trauma-related psychiatric risk-factors (i.e., behavioural disengagement, physical inactivity and emotional suppression), including exercise and imagery interventions.</p> <p>Interventions were most likely to improve outcomes such as well-being, stress, and sleep problems, rather than improve mental health symptomology.</p>
Digital interventions							
Kuster et al., 2017	10	Employees	Workplace	Digital vs. face-to-face stress management interventions	N= 2 RCT	Stress, burnout	<p>Workers were primarily white, Caucasian, middle-aged, and college educated. Both studies delivered education about stress, its causes, and strategies to reduce stress (e.g., relaxation or mindfulness) via a computer in the computer-based arm, and via small group sessions in the in-person arm.</p> <p>Both studies measured stress using different scales at short-term follow-up only (less than one month). Due to considerable heterogeneity in the results, we could not pool the data, and we analysed the results of the studies separately.</p>

							Very low-quality evidence with conflicting results, when comparing the effectiveness of computer-based stress management interventions with in-person stress management interventions in employees.
Other							
Kotera & Van Gordon, 2021	9	Employees	Workplace	Self-compassion training	N=10 RCT, QE	Work-related well-being	<p>Findings indicate that self-compassion training can improve self-compassion and other work-related well-being outcomes in working populations.</p> <p>The methodological quality of these studies was medium. All ten studies recruited workers in a caring field and were mostly conducted in Western countries.</p> <p>There is need for greater methodological quality in work-related self-compassion intervention studies to advance understanding regarding the applications and limitations of this technique in work contexts.</p>
Gritzka et al., 2020	10	Employees	Workplace	Nature-based interventions	N=10 RCT, QE	Mental health and wellbeing (mental health indices, cognitive ability, recovery and restoration, work and life satisfaction, and psychophysiological indicators)	<p>Consistently positive effects on mental health indices and cognitive ability, while mixed results were found for the other outcome categories.</p> <p>Heterogeneity in interventions and high risk of bias in individual studies</p>
Otto et al., 2021	9	Nurses (elderly care)	Workplace	Interventions to improve	N=6 RCT	Physical and mental health outcomes,	CBT interventions showed significant effects on job satisfaction, however, no effects on general wellbeing, work

				physical and mental health (Physical activity [1], CBT [3], organisational [1], mixed [1])		job satisfaction and work engagement	<p>engagement or intrinsic motivation were reported. One study reported significant improvement on symptoms of mental health difficulties following an ACT intervention.</p> <p>Significant improvements in burnout and job satisfaction were reported after organisational intervention focused on emotion-oriented care. Improvement in subjective physical health, stress management and health and work maintenance were reported after a combined intervention consisting of physical activity, CBT and organisational components.</p>
Melnyk et al., 2020	9	Physicians and nurses	Workplace	Interventions to improve mental health, wellbeing, physical health and lifestyle behaviours	N=29 RCT	Mental health and wellbeing, physical health	<p>Interventions included MBSR (n=12), lifestyle interventions (n=7), online CBT (n=2), other (stress management, yoga, breathing exercises, journaling, n=8).</p> <p>In terms of mental health outcomes, mindfulness and CBT may be effective in reducing stress, anxiety and depression. Brief interventions that incorporate deep breathing and gratitude may also be beneficial.</p> <p>Heterogeneity in intervention approaches and outcome measures limit the conclusions that can be drawn from the studies.</p>
Quasi-experimental design (QE); Mindfulness-based Cognitive Therapy (MBCT); Mindfulness-based Stress Reduction (MBSR); Quality of Life (QoL); Randomised Controlled Trial (RCT)							

Digital interventions – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other
Twomey & O'Reilly, 2017	10	Adults with elevated mental ill-health symptoms or seeking mental health interventions	Digital	MoodGYM Computerised CBT programme	N=11 RCTs	Primary: depression Secondary: anxiety & psychological distress	Depression + (g=0.36, adjusted to 0.17 for publication bias) Anxiety + (g=0.57; measured in six studies) Psychological distress 0	Type of setting (clinical vs non-clinical) had no meaningful influence on results. Effects sizes were larger with face-to-face clinician guidance.
Twomey et al., 2017	10	Adults with elevated depressive symptoms or seeking mental health interventions	Digital	Deprexis Individually tailored computerised CBT programme	N=8 RCTs	Depression	Depression + (g=0.54)	Level of clinician guidance alongside Deprexis had statistically non-significant impact on effect sizes.
Twomey et al., 2020	10	Adults	Digital	Deprexis	N=12 RCTs	Depression	Depression + (g=0.51)	Results were analogous when study quality, screening and randomisation procedure were taken into account.

								Clinician guidance, developer-involvement, setting (community vs. clinical), and initial symptom severity did not have statistically significant effects on the effect size, and there was no evidence of publication bias.
Rigabert et al., 2020	11	Non-depressed people	Digital	Psychological & psychoeducational interventions All interventions based on CBT, complemented with IPT (3) & problem-solving techniques (3)	N=22 RCTs	Depression	Depression + (SMD= -0.26)	Effect sizes decreased slightly over time. Effect sizes were higher in indicated prevention interventions, with interactive website delivery and with five or six sessions.
Thompson et al., 2021	11	General population Over 18 years	Digital	Internet-based ACT	N=25 RCTs	Mental health outcomes	Anxiety (g=0.24) Depression (g=0.36) QoL (g=0.27) Psychological flexibility (g=0.32)	Effects were maintained at follow-up. Interventions with therapist guidance demonstrated greater effectiveness in improving depression & psychological flexibility outcomes compared to nonguided internet-based ACT.

								Populations defined by a psychological condition or symptoms (e.g., depressed samples) demonstrated greater improvements in anxiety compared to nonclinical or somatic populations.
Deady et al., 2017	11	General population 18 – 64 years Subclinical or nonclinical	Digital	eHealth interventions Interventions included CBT (8), ACT (1) & unspecified self-help emails	N=10 RCTs	Depression and anxiety symptoms	Depression + (0.25) Anxiety + (0.31) Universal & indicated/selective interventions had similar positive effects (0.29 & 0.25 respectively).	While short term effects were small but positive, there was inadequate evidence on their medium to long-term effectiveness. Four trials were indicated prevention & one trial was selective prevention.
Garrido et al., 2019	10	Young people 12 – 25 years	Digital	Digital mental health interventions Interventions delivered by computer, smart phones or online	N=15 RCTs	Depression	Versus passive control: Depression + (d=0.33) Versus active control: Depression 0	Effect sizes were higher when supervision or higher interaction was involved. Engagement & adherence rates were low. Digital interventions work better than no intervention, however they do not work better than active alternatives regardless of the level of support.

Victorson et al., 2020	11	General population	Digital	Technology-enabled mindfulness-based programmes for negative affect & mindful awareness E.g., MBSR, MBCT, ACT & their derivatives	N=43 RCTs	Negative affect (e.g., depression, anxiety & stress) & mindful awareness	Stress + (g = - 0.47). Anxiety + (g = - 0.21) Depression + (g = - 0.25) Mindful awareness (g = 0.40)	Independent use of technology-enabled mindfulness-based programmes resulted in greater stress reduction (compared to the inclusion of human support).
Acceptance & Commitment Therapy (ACT); Compact Disk Read-only Memory (CD-ROM); Cognitive Behavioural Therapy (CBT); Quasi-experimental (QE); Interpersonal Therapy (IPT); Mindfulness-based Stress Reduction (MBSR); Mindfulness-based Cognitive Therapy (MBCT); Quality of Life (QoL); Randomised Controlled Trial (RCT); Risk of Bias (ROB); Standard Deviation (SD); Standardised Mean Differences (SMD).								
Interpreting effect sizes: Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

Digital interventions – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Other
Pallavicini et al., 2018	8	Healthy adults 18 – 59 years	Digital	Video games e.g., action games (15), puzzle games (8), driving-racing games (3),	N=35 RCT, QE	Cognitive & Emotional Training	Four RCTs & one QE assessed emotional skills & found positive effects (effect sizes ranging from 0.201 to 3.01) in inducing positive emotions & reducing individual levels of stress.

				exergames (3), horror games etc.			
Leech et al., 2021	11	Adolescents & young adults in high income countries Aged 10 – 35	Digital	Mental health apps Interventions included mindfulness & CBT- based apps	N=11 RCT	Depression, distress, anxiety, stress, mental health	<p>Small positive effects were found for stress and small-to-medium effects for mental health. Pooled effect was robust for depression, but longer-term data found similar reductions as controls. Effects for distress and anxiety were mixed with mostly no significant improvements.</p> <p>No deterioration in symptoms was noted – rather, similar or greater improvements were reported by control groups on one or more outcomes.</p> <p>Self-reported low (21%) dropout rate (in contrast with reviews on adults).</p>
Zheng et al., 2021	10	Young people 5 – 19 years, non-clinical	Digital only (50%), in-person only (25%), blended (25%)	Serious games as a complementary tool for social skill development	N=12 RCT, QE	Social skills	<p>Findings are mixed but suggest that serious games may improve social skills when used alongside in-person discussion & facilitated by trained personnel & teachers.</p> <p>Higher effect sizes observed for waitlist controls versus active controls</p> <p>Longer length of time of gameplay, intervention & follow-up may positively influence effects of serious games on social skills.</p>
Cognitive Behavioural Therapy (CBT); Quasi-experimental (QE); Randomised Controlled Trial (RCT); Risk of Bias (ROB)							

Primary care – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other
Conejo-Ceron et al., 2017	11	General population not depressed at baseline	Primary Care	Psychological & educational interventions Mostly CBT (12)	N=14 RCTs	Prevention of depression	Overall pooled effect + (SMD= -0.163; OR 0.744) Selective prevention + (SMD= -0.236) Indicated prevention +(SMD= -0.134)	Interventions included indicated (9), selective (4) and universal (1) prevention interventions in individual (10) or group (4) sessions No significant differences when implementors were primary care staff or mental health providers.
Cognitive Behavioural Therapy (CBT); Odds Ratio (OR); Randomised Controlled Trial (RCT); Standardised Mean Difference (SMD)								
Interpreting effect sizes: Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

Primary care – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Rojas et al., 2019	8	Youth Infancy (birth – two), preschool (3 – 5), school (6 – 12) & adolescence (13 – 18)	Primary Care	Prevention programmes targeting youth mental & behavioural health Interventions included parent-focused, family-centred, youth-focused with & without	N=17 RCTs	Externalising & internalising outcomes	Overall, eleven of the interventions produced desired results, seven did not produce significant differences between experimental and control conditions. One intervention led to slight increases in alcohol consumption regardless of aiming to reduce it. No significant effects were reported for interventions targeting the infancy phase (n=2).

		Prior to the onset of disorder		counselling component			Most efficacious interventions were indicated/selective (rather than universal), had booster sessions, were developed specifically for subgroups (e.g., ethnicity & culture) and included follow-ups with non-clinic behaviour health specialists.
Kuroda et al., 2021	8	Adults	Primary Care	Self-help interventions for depression Cognitive restructuring & behavioral activation were elements appearing in > 80% of successful interventions	N=20 RCTs	Depressive symptoms or psychological distress	Twelve out of 21 interventions were successful. Successful interventions included weekly brief human support (e.g., technical assistance or feedback) by psychotherapists or designated non-psychologist care providers. Other commonalities in successful interventions included social support activation, homework assignments & interpersonal skills.
Randomised Controlled Trial (RCT)							

Awareness raising – Meta-analyses

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Direction and magnitude of effects	Other
Liang et al., 2021	10	College students Aged 19 – 27	Educational institution	Mental Health First Aid training (MHFA)	N=5 RCT, QE	Knowledge, belief, stigma attitude, confidence, intentions	Knowledge + (SMD=0.49) Confidence + (SMD=0.71) Stigma attitude & intention to provide MHFA to people with mental illness 0	Shorter programme length (under 10 hours) produced yield larger positive effects. Improvements lasted up to 6 months follow-up.

Maslowski et al., 2019	11	Adults and young people	Mixed	Mental Health First Aid (MHFA)	N=16 RCT, QE	Knowledge, stigmatising attitudes, confidence/intentions, provision of MHFA Distress among trainees & recipients	Trainees' knowledge attitudes and behaviour-intention (combined) + (g=0.37) Knowledge + (g=0.53) Attitudes + (g=0.18) Confidence in providing help + (g=0.55) Self-reported helping behaviour + (g=0.29) Trainee distress 0	Only two studies examined the effects for those who received help from the trainees, with no significant effects reported. Significant heterogeneity in effect sizes across studies regarding behaviour and confidence. Marginally significant (p=0.08) small effect on trainee distress.
Morgan et al., 2018	11	Adults Aged 18 & older	Mostly workplaces & education institutions	Mental Health First Aid training (MHFA) Both adult & youth versions and face-to-face or online	N=18 RCT, QE RCT, cluster RCT, QE	Knowledge, stigmatising attitudes, confidence/intentions, provision of MHFA Secondary: mental health of trainees & recipients	MHFA knowledge + (d=0.72) Recognition of mental disorders + (d=0.22) Beliefs about effective treatments + (d=0.45). Reductions in stigma + (d=0.14). Confidence in helping a person with a mental health problem + (d=0.58) Intentions to provide first aid + (d=0.75)	Effects appeared to last up to 6 months later, with effects up to 12-months later unclear. Longer programmes were associated with lower scores on beliefs about effective treatments at follow-up. No significant improvement in trainer health with small non-significant effects on recipient health.
Xu et al., 2018	10	General population	Various settings	Interventions to promote help-	N=97 RCT, QE	Help-seeking attitudes, intentions & behaviours	Attitudes + (SMD=0.26) Intentions to seek help + (SMD=0.26)	Overall, mostly short-term effects, however motivational enhancement strategies were

				seeking for mental health problems Mostly psychoeducational, CBT, social contact & motivational enhancement		Secondary: mental health literacy & stigma	Formal help-seeking behaviours + (OR=1.71) Informal help-seeking 0 Self-help compared to inactive control + (OR=1.47) & active control (OR=2.72) Mental health literacy + (SMD=0.40) Mental illness stigma had mixed findings, with personal stigma reporting + (SMD=0.21)	only effective at long-term follow-up. There was no evidence that interventions targeting relatives, significant others or campus-based gatekeepers improved seeking professional help among people with mental health problems. Targeted interventions appear more effective especially for help-seeking behaviours.
Cognitive Behavioural Therapy (CBT); Odds ratios (OR); Quasi-experimental (QE); Quality of Life (QoL); Randomised Controlled Trial (RCT); Risk of Bias (ROB); Standardised Mean Differences (SMD)								
Interpreting effect sizes: Cohen's d (1988): 0–0.19=negligible effect, 0.20–0.49=small effect, 0.50–0.79=moderate effect and ≥0.80=large effect; Hedges g (1981): 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; Standardised Mean Difference (SMD) : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect; ES : 0.2 = small effect, 0.5 = moderate effect, and 0.8 = large effect								

Awareness raising – Systematic reviews

Author, Year of publication	Quality rating	Population	Setting	Type of intervention	Number of studies	Outcomes measured	Findings
Seedaket et al., 2020	9	Adolescents Aged 10 – 19	School-based (5) & community-based (2)	Mental health literacy programmes	N=7 RCTs	Knowledge, attitudes, willingness to interact with a mental illness & help-seeking	Education stand-alone programme (versus education plus a contact-based group) is likely to be effective for improving mental health literacy.

							<p>Interventions were more effective at improving mental health knowledge than attitudes & stigma, & improvements in help-seeking were least reported.</p> <p>Scarce data is insufficient to confirm that community-based interventions are effective.</p>
Tay et al., 2018	10	<p>Adolescents & young adults</p> <p>Aged 10 – 24</p>	Mostly educational setting	Information & communication technologies interventions	N=19 RCTs (9), QE (10)	Mental health literacy (MHL), stigma, help-seeking etc.	<p>Interventions were useful to enhance MHL of less-known disorders such as anxiety disorder & anorexia, but not depression.</p> <p>Interventions that were effective in enhancing depression MHL comprised active component such as videos or quizzes.</p> <p>Interventions that successfully elevated MHL also reduced stigma. Elevated MHL levels did not improve help-seeking, & reduction in stigma levels did not enhance help-seeking behaviours.</p>
Waqas et al., 2020	10	Mostly adults & adolescents	<p>Educational institutes</p> <p>Mostly high-income countries</p>	<p>Interventions to reduce stigma related to mental illnesses</p> <p>(Psychoeducation and contact-based interventions and role-play to address stigma</p>	N=44 RCTs	Stigma, knowledge, attitudes, help-seeking, social distance & recognition/ literacy regarding depression.	<p>Consistent positive effects were observed for stigma, attitudes, help-seeking & knowledge of mental health including recognition of depression.</p> <p>Favourable results were observed for social distancing when participants had the opportunity to contact with individuals with mental</p>

				towards mental illnesses)			illness compared to non-significant results when strategies lacked this component.
Quasi-experimental (QE); Randomised Controlled Trial (RCT); Risk of Bias (ROB)							