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Review

The Impact of Wellbeing Interventions on the Anxiety Levels of Children Attending Low-Income Schools: A Systematic Literature Review

Tracy O'Halloran [1], Jennifer Symonds [2, *], Linda Bhreathnach [1, 2]

1. University College Dublin, Belfield, Dublin, Ireland; E-Mails: tracy.ohalloran@ucdconnect.ie; linda.bhreathnach@ucd.ie
2. University College London, Bloomsbury, London, England; E-mail: j.symonds@ucl.ac.uk;

* **Correspondence:** Jennifer Symonds; E-Mail: j.symonds@ucl.ac.uk

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Abstract

This systematic review examined the impact of wellbeing interventions on the anxiety levels of children attending low-income schools. Studies, published between January 2000 and April 2022, were included if they had samples of school aged children attending low-income schools who were given a universal school-based wellbeing intervention. Ten databases were searched systematically to identify 542 records. After title and abstract screening, 43 records remained for full text screening, and of these studies, 10 met inclusion criteria. Quantitative data were extracted and were analysed narratively. The review found that in 50% of studies, wellbeing interventions were effective for reducing anxiety and that the impacts were maintained longer-term. The effects were stronger for girls when measured using self-report and were stronger for boys when measured using parental report.

Keywords

Adolescence; anxiety; child; intervention; school; social class; wellbeing

1. Introduction

Children from lower socioeconomic status (SES) households are found in some studies to have a higher risk of developing anxiety in comparison with their counterparts from more privileged backgrounds [1, 2]. Research shows that schools are one of the most important places for enhancing the wellbeing of young people [3] and wellbeing interventions, also known as social and emotional learning (SEL) interventions, are widely used to help to achieve this aim [4]. Previous systematic reviews have explored the impact of school-based, universal wellbeing interventions on numerous outcomes, including anxiety [3, 5], however, no existing review focuses specifically on low-income schools. Therefore, there is a gap in the literature for a summary of the evidence of the effectiveness of wellbeing interventions for reducing anxiety in children in low-income schools.

The aims of the current systematic literature review are to synthesise the evidence on whether wellbeing interventions are effective in reducing anxiety for children in low-income schools. The review also aims to uncover if these effects are long-lived, and whether gender moderates the effects. In addition to making a valuable contribution to the academic literature, this review should be able to help educators in low-income schools to make evidence-informed decisions as to whether wellbeing interventions are the most effective strategy for alleviating the anxiety levels of their students.

1.1 School-Based Wellbeing Interventions

As students typically do not learn in isolation but rather in collaboration with their teachers, amongst their peers, and with the support of their families, wellbeing interventions within the school setting include social as well as emotional education [3]. Wellbeing interventions target the same outcomes as SEL interventions, being designed to enhance the wellbeing of children focusing on social and emotional domains [3]. Therefore, given their homogeneous purpose within the school context, in this study the term wellbeing intervention also refers to what is more commonly known in the United States as a SEL intervention.

Contemporary research finds that schools are one of the most important places for enhancing the wellbeing of children and teenagers [3]. Promoting wellbeing amongst young people is vital as emotional wellbeing in childhood is a more powerful predictor of a satisfying and successful life in adulthood over other variables such as income, educational level and family status [6]. Prevention and early intervention are vital due to the high prevalence rates, persistent nature, and adverse consequences of high anxiety levels in childhood [7]. The World Health Organisation (WHO) advocates for supporting mental health through "interventions that promote competence and psychological strengths" ([8], p.43) and existing research offers support for the use of school-based wellbeing interventions for reducing symptoms of anxiety [9]. A recent meta-analysis conducted by Taylor et al. [10] reviewed follow-up outcomes of wellbeing interventions from six months to eighteen years post-intervention. Statistically significant, positive effects were found for several outcomes, including positive social behaviour and emotional distress, demonstrating the effectiveness of wellbeing interventions. This suggests that positive effects arising from wellbeing intervention engagement may be sustained long-term.

It is important to emphasise the vital role that schools play in extending the reach of interventions to under-serviced, low SES populations, which helps to improve quality of life in those communities [11]. Bumbarger and Perkins [12] emphasise the need to consider the context in which

interventions will be delivered. Interventions which are implemented consistently over several years and are sensitive to the cultural, community and developmental norms of the children are more likely to produce lasting positive effects [13]. Despite the breadth of evidence supporting the effectiveness of wellbeing interventions, the results of carefully controlled studies do not always translate to the real world [14]. This is particularly salient in low-income school settings where contextual barriers to effective intervention implementation exist, along with unique challenges encountered by teachers, parents and students alike [15]. These contextual nuances may not be captured in many of the studies comprising the evidence-base for wellbeing interventions. In addition, gender is likely to have an impact on wellbeing intervention effectiveness, however, the exact nature of this impact is unclear [16]. Therefore, further research is needed to explore this effect, particularly among low-income school populations.

1.2 Socioeconomic Disadvantage and Low-Income Schools

While socioeconomic disadvantage is a difficult concept to define and measure due to its multifaceted and complex nature, Moran [17] highlights the reconceptualization of social disadvantage as social inclusion and exclusion in recent times. Social exclusion is increasingly seen as an individual problem, whereby the socially excluded are stereotyped as being illiterate, having poor educational attainment, being lazy, single motherhood, and higher levels of delinquency, crime, substance abuse and mental health problems. These negative biases convey a culture of dependency and promote the idea of an underclass who are responsible for their own social exclusion. Moran [17] provides critical alternatives to this stereotypical view of social exclusion as an individual problem. These alternatives include the flawed nature of labour markets which prioritise economic growth and prosperity over the thriving of excluded populations, and a redistributive model of inclusion, which emphasises the need for institutional change through the reorganisation of power and resources [17].

Children and teenagers from low SES homes are two to three times more likely to develop psychological difficulties than their peers from higher SES backgrounds [18]. The social causation hypothesis suggests that this is because low SES is associated with an increased exposure to environmental adversity, stress and disadvantage, which increases the risk of psychological difficulties [19]. Psychopathology results in an inability to fulfil role expectations, which means that children from low SES homes who go on to experience psychological problems in adulthood are more likely to remain in the low SES bracket [20]. The failure to recognise and address these risks for children will have significant implications for their future, allowing the cycle of disadvantage to continue and preventing young people from reaching their potentials [21].

Schools situated in low SES areas are typically faced with a variety of difficulties, including challenging pupil behaviour, higher levels of staff changes, lower educational achievement and lower quality physical environments [22]. Research suggests that the highest performing education systems are those that combine high academic standards and equity, whereby students are equipped to acquire higher level knowledge and skills irrespective of their SES [23]. As such, there are many initiatives worldwide to facilitate equitable education. In England, the ‘pupil premium’ is extra funding provided to publicly funded schools to help improve the attainment of low SES pupils [24]. In the USA, ‘Title 1 schools’, where more than 40% of pupils must come from backgrounds of poverty [25], were established with the aim of improving education for children from poorer homes

[26]. In Ireland the DEIS programme, which stands for Delivering Equality of Opportunity in Schools, was established in 2006 to help to identify and support schools with sufficiently high levels of socioeconomic disadvantage. Extra funding is provided to these schools to improve teaching and learning experiences for pupils [27].

1.3 Anxiety

Anxiety can be conceptualised as "a multicomponent response system involving affective, cognitive, behavioural and physiological processes that are activated when we foresee potential future danger or threat or potentially overwhelming or uncomfortable situations" ([28], p. 1487). Anxiety can cause significant distress and is characterised by symptoms such as irritability, poor concentration, and sleep disturbance [29]. The behaviours and symptoms conveying childhood anxiety are separation anxiety, phobias, extreme self-consciousness, fearfulness, irrational thoughts about past behaviours and intense worrying [30]. Prevalence rates for childhood anxiety are estimated to be approximately 10%, making it one of the most common childhood psychological disorders [2].

Anxiety is associated with adverse outcomes for children therefore it is important to gain an understanding of how anxiety can be prevented and managed. For example, anxiety is linked to lower academic performance and poorer social and emotional development in childhood [31], as well as a higher likelihood of risky behaviours, self-harm and suicide [5], negative peer and parental relationships [7], and drug, alcohol and nicotine dependence [32]. Childhood anxiety often remains unidentified as these children tend to be shy, compliant and cooperative [2], and internalising behaviours often tend to be overlooked by school staff and parents [30].

Importantly, children from disadvantaged communities are also less likely to receive psychological support for mental health issues including anxiety [11, 33, 34]. In addition, when children from lower SES backgrounds do access psychological support they are more likely to terminate their sessions prematurely [2]. Therefore school-based wellbeing interventions are increasingly important as they can be administered within the school setting to all children including those at risk of anxiety. School-based wellbeing interventions have been found to be a feasible and effective method of universally delivering education that may ameliorate anxiety problems for children within the school system [2]. However, though there is evidence that children from lower SES backgrounds have a higher risk for anxiety disorders there is a dearth of research that conclusively outlines the efficacy of school-based wellbeing interventions for children in lower SES schools.

1.4 Gender

There is a well-established female preponderance in anxiety prevalence. Across the lifespan females have repeatedly been found to be more likely to suffer from anxiety than males [35]. Furthermore, previous research suggests that gender differences in the development of internalising mental health problems such as anxiety may be partly attributable to variations in the socialisation process for males and females. The process of socialisation is thought to be intensified during school years and to nurture concepts of masculinity and femininity [35]. Moreover, following their meta-analysis of school-based interventions Rowe & Tricket [16] highlighted the need for a more nuanced understanding of how universal wellbeing interventions may be moderated by

gender, and note that diversity must be considered when assessing the generalisability of interventions.

While investigating all possible moderating diversity categories is outside the scope of this paper, given the preponderance of females with anxiety this paper will investigate the role of gender [35]. Gender based differences identified may assist in developing universal interventions that include information that is relevant to diverse groups within the larger target population.

1.5 Objectives

This review focuses on the effectiveness of wellbeing interventions on the anxiety levels of children from low SES backgrounds. Despite the higher prevalence of mental health difficulties in low SES populations, people from these communities are less likely to access mental-health services, while those who do seek support are more likely to disengage [18]. Schools are in a unique position to equip children with the prerequisite skills to prevent and treat anxiety, something which is particularly important in removing barriers to mental health support for those in low SES communities [36].

A key objective for this review is to locate and identify research that explores the impact of wellbeing interventions on children's anxiety levels in low-income schools. In addition, it sought to collate and summarise the results of the published research using a narrative synthesis to draw key findings.

1.6 Research Questions

1. Are wellbeing interventions effective at reducing the anxiety levels of children attending low-income schools? Contemporary research shows that school-based wellbeing interventions have the potential to reduce symptoms of anxiety [9], so we aimed to summarise whether wellbeing interventions are effective at reducing the anxiety levels of student populations in low-income schools.
2. Are positive outcomes arising from wellbeing interventions sustained? Research suggests that positive outcomes which arise from wellbeing intervention engagement may be sustained over time [10], therefore, we aim to see whether this is also true for low-income school populations. If effects are not sustainable, this will have important implications for policy and practice.
3. Does gender moderate the effect of interventions? Existing research suggests that it does [16], although this impact is unclear, and no research has been conducted among exclusively low-income school populations.
4. What are the qualities of effective interventions for reducing anxiety in low income school populations? Identifying factors which may impact the effectiveness of interventions is important for helping wellbeing intervention designers and educators understand the factors which may compromise intervention effectiveness. This may encourage intervention designers and educators to think of ways in which these factors may be mitigated.

In summary, the review sought to document the evidence on the impact of wellbeing interventions on anxiety in students in low-income schools, to provide educators with valuable information to inform their decision making regarding whether wellbeing interventions are worth

implementing, and whether those interventions may need tailoring to children's gender and socioeconomic circumstances.

2. Materials and Methods

2.1 Search Strategy

A systematic literature search was undertaken in October 2020 and was updated in April 2022 using Scopus, APA PsycArticles, APA PsycBooks, APA PsycInfo, Australian Education Index, Ebook Central, ERIC, Education Collection, International Bibliography of the Social Sciences (IBSS), and the Library and Information Science Collection and Social Science Database. These databases were selected because of their relevance to educational psychology. Aside from Scopus, all databases were accessed using ProQuest. Filters were applied to each search, for example, only peer reviewed journals published in English between 2000 and 2022, were selected. Grey literature was searched using the Google Scholar search engine. Only peer-reviewed articles were chosen for inclusion to ensure that only high-quality empirical evidence was synthesised.

The search string (Table 1) was created to identify the target constructs of socioeconomic disadvantage, low-income schools, wellbeing interventions, anxiety and child and adolescent samples in mainstream schools. As socioeconomic disadvantage, low-income schools and wellbeing interventions are referred to in a variety of ways in the literature, a wide range of synonyms for each term were included in the search. In addition to generic terms for wellbeing and social and emotional learning interventions, specific wellbeing interventions that are prominent in the field (e.g., Friends for Life) were included as search terms to broaden the search. Terms to be excluded were also added to this search string. The search terms were applied to document titles, abstracts and keywords.

Table 1 Search Terms.

Construct	Boolean operator	Synonyms
Socioeconomic disadvantage	AND	("disadvantaged" OR "low socio-economic status" OR "low-income" OR "social deprivation" OR "socio-economic deprivation" OR "socially marginali*ed" OR "social class" OR "povert*" OR "educational disadvantage" OR "free school meals" OR "economic* disadvantage" OR "low socioeconomic status" OR "low SES" OR "social justice" OR unemploy* OR "economic advantage" OR affluence OR "OR "single parent family" OR "mother* educational level" OR "parent educational level" OR "racial minority" OR "ethnic minority" OR "social exclusion")
Low-income schools	AND	(school* OR classroom OR student OR pupil)
Wellbeing	AND	("social and emotional" OR "emotional and social" OR "SEL" OR "mental health" OR "wellbeing" OR "well-being" OR "emotional regulation" OR "self-regulation" OR "social skills" OR "resilience" OR "emotional resilience" OR

		"coping" OR "FRIENDS for Life" OR "Social and Emotional Aspects of Learning" OR "SEAL" OR "Zippy's Friends" OR "Preventing Alternative Thinking Strategies" OR "PATHS" OR "Aussie Optimism" OR "Incredible Years" OR "IY" OR "Weaving Wellbeing")
Interventions	AND	(program* OR intervention OR "school-based" OR treatment OR lesson OR curriculum)
Anxiety	AND	(anxiety)
Child and adolescent sample	NOT	(undergraduate OR college OR freshman OR sophomore OR university OR "third level" OR "higher education" OR "further education" OR "pre-school" OR "playschool" OR "montessori" OR "head start" OR "early childhood" OR "kindergarden" OR "kindergarten")

2.2 Screening and Selection Process

In the ten ProQuest databases, 284 four records were identified. In an identical manner, 362 records were identified by using the Scopus database. An additional 18 relevant documents were obtained from Google Scholar. The details of all 664 records were combined into one sheet on Microsoft Excel, and 121 duplicate documents were removed. An additional document was removed as it was not in English. Next, 542 documents were screened by scanning their titles and abstracts for keywords and phrases according to the inclusion and exclusion criteria. There were 499 of these documents that did not meet the inclusion criteria and were therefore excluded at this point. All 43 full-text articles were accessed successfully and screened in greater detail to assess for eligibility.

This in-depth screening resulted in a further 33 articles being excluded as they did not meet inclusion criteria. Twenty-one studies involved school samples that did not come from an area of low SES, and nine studies did not have anxiety as an outcome measure. One study was a thesis and only looked at mindfulness and mental health techniques in isolation. The thesis was excluded as it was not peer-reviewed and it did not meet the criteria for a universal wellbeing programme. Another study was excluded as it involved a sample of children with a clinical diagnosis of anxiety while another was a 30-month follow-up of another study which is included in this review and so was not chosen as a standalone study. Ten studies fully met the inclusion criteria and were chosen for inclusion in the final synthesis. A PRISMA diagram, which illustrates the steps taken to arrive at a final set of documents eligible for review, is outlined in Figure S1. The references for the final set of included studies can be found in Table S1.

2.3 Data Extraction and Synthesis

Descriptive data such as sample size and measures were extracted and catalogued for each study. Relevant statistics such as means (*M*), standard deviations (*SD*), effect sizes and significance values (*p*), were extracted to help provide a more detailed understanding of the outcomes of each study. The mean and standard deviations allow for easy comparison of pre- and post-intervention values, effect sizes illustrate the difference between pre- and post-intervention groups on measures of

anxiety and significance values inform whether the intervention was effective at reducing anxiety in students attending low-income schools.

As this review focuses on the effect of wellbeing interventions on anxiety levels, we considered conducting a meta-analysis to allow results from individual intervention studies to be combined to give an overall measure of the effect of one intervention compared with another [37]. However, a meta-analysis is only appropriate if the assumption of homogeneity is satisfied. To check this, four aspects were assessed. The first involved identifying if all studies were similar in terms of the participants they recruited, and this was true for the studies included in this review. However, the included studies compared different interventions and used various comparators to measure anxiety, the time frame over which outcomes were measured was different due to variations in programme duration, ranging from eight weeks to five months, and studies varied in their effects. Due to several of these criteria not being met, the assumption of homogeneity was not satisfied, and it was decided that it was not appropriate to carry out a meta-analysis [38].

Instead, extracted data were synthesised using a narrative synthesis. This approach can involve the manipulation of statistical data however it typically uses a textual approach to tell the story of the findings [39].

2.4 Quality Appraisal Method

Each of the ten included studies underwent a quality analysis using the CASP checklists. Seven of the included studies are Randomised Controlled Trials (RCTs) and these were quality assessed using the CASP RCT checklist [40]. Three of the included studies are of a cohort design and were assessed using the CASP cohort study checklist [41]. All the ten studies had a clearly focused question which they sought to investigate. Studies were scored according to the criteria on the checklists out of a possible total. The RCT checklist has a possible total of 11, and the cohort study checklist has a possible total of 12. For ease of interpretation, the scores for each study are presented as percentages.

The research reported here is a systematic review of published literature. As such, there are no ethical impacts to report.

3. Results

Table 2 summarises the ten studies according to their location, sample size, sample gender, measures, analysis methods, quality rating and theoretical perspective. Data in all studies were collected using self-report rating scales.

Table 2 Study Characteristics.

Study Name	Location	N	Study Design	Nature of Randomisation	Anxiety Measures and Informant(s)	Analysis Method(s)	Quality Rating	Intervention Name	Intervention Theoretical Perspective	Intervention Effect Size
Dowling et al. [14]	Republic of Ireland	497	Randomised Controlled Trial	Schools as the unit of randomisation	Depression Anxiety and Stress Scale (DASS-21) *Child self-report*	Intention to treat analysis Linear mixed model framework	82%	Mind Out	Collaborative for Academic, Social and Emotional Learning (CASEL) theoretical framework for SEL	d = -1.50
Iizuka et al. [42]	Australia	69	Single group pre-post design	Non-applicable	Spence Children's Anxiety Scale (SCAS) *Child self-report*	Wilcoxen signed ranked test for pairwise comparisons	67%	FRIENDS For Life	Cognitive behavioural theory (CBT)	d = -0.40
Lewis et al. [43]	Chicago, USA	1,170	Matched pair, cluster randomised controlled trial	Random assignment to intervention or control group with seven schools in each group	Behaviour Assessment System for Children (BASC) *Child self-report*	Growth-curve and structural-equation modelling (SEM) analyses	82%	Positive Action	Theories of self-concept, particularly Self-esteem Enhancement Theory (SET)	d = -0.26

Mifsud & Rapee [11]	Australia	91	Randomised controlled trial	Nine schools randomly allocated to active intervention or waitlist control	SCAS *Child self-report* Children's Automatic Thoughts Scale *Child self-report* Spence Children's Anxiety Scale-Parent version *Parent report* Internalising scales of the Child Behaviour Checklist *Teacher report form*	Repeated measures analyses of covariance Pairwise t-tests	73%	Cool Kids Programme	CBT	d = -0.37
Pophillat et al. [44]	Australia	206	Randomised controlled trial	Random allocation of Year 1-3 classes into	SCAS *Child self-report* SCAS-P	Multi-level mixed effect linear regression model	82%	Aussie Optimism: Feelings and Friends	CBT	d = 0.10

				intervention or control groups	*Parent report*				
Roberts et al. [45]	Australia	496	Randomised controlled trial	Six pairs of schools were matched and randomised to conditions	RCMAS *Child self-report* CBCL *Parent report*	Two group ANCOVAs for each outcome Chi square and logistic regressions	73%	Aussie Optimism: Optimistic Thinking Skills and Social Life Skills	CBT	d = 0.26
Rodgers & Dunsmuir [30]	Republic of Ireland	62	Randomised controlled trial	Random allocation to intervention or control group within each school (3 in total)	SCAS *Child self-report* SCAS-P *Parent report*	Mixed design ANOVA Pearson Correlation Coefficient	45%	FRIENDS For Life	CBT	d = -0.47
Rooney et al. [46]	Australia	910	Randomised controlled trial	Students from 22 low SES schools were randomly assigned to an intervention or control group	SCAS *Child self-report*	Multi-level mixed effects linear regression models	73%	Aussie Optimism: Positive Thinking Skills	CBT	d = 0.20
Rooney et al. [47]	Australia	120	Randomised controlled trial	Four schools randomly selected. Pairs of schools matched on	RCMAS *Child self-report*	ANCOVA ANOVA	67%	Aussie Optimism: Positive Thinking Skills	CBT	d = 0.54

				key characteristics e.g. SES. One school from each pair randomly assigned to intervention or control.						
Stopa et al. [36]	Australia	963	Single-group pre-post design	Non-applicable	RCMAS SCAS *Child self-report*	Linear mixed effects models, ANOVAs, t-tests and regressions	92%	FRIENDS For Life	CBT	RCMAS: d = -0.25 SCAS: d = -0.28

Note. ANCOVA = Analysis of Covariance, ANOVA = Analysis of Variance, BASC = Behaviour Assessment System for Children, CASEL = Collaborative for Academic, Social and Emotional Learning, CATS = Children's Automatic Thoughts Scale, CBCL = Child Behaviour Checklist, CBT = Cognitive Behavioural Therapy, DASS-21 = Depression Anxiety Stress Scale- 21 Items, RCMAS = Revised Children's Manifest Anxiety Scale, SEM = Structural Equation Modelling, SET = Self-esteem Enhancement Theory, SCAS = Spence Children's Anxiety Scale, SCAS-P = Spence Children's Anxiety Scale-Parent.

3.1 Quality Appraisal Results

Seven of the studies achieved a quality rating of between 73% and 92%, while three studies achieved a quality rating of between 45% and 67%. The full results of the CASP checklists for each study are given in Table S3 and Table S4. All seven RCTs reported sufficient information on randomisation procedures, including a report of the number of participants randomised. Nine of the ten studies accounted for all participants at the conclusion and clearly stated the number of participants who dropped out, the reasons for this and the possible effects of attrition on study results and how this was controlled for. Participants were not blinded in any of the studies as students were either exposed to a specific wellbeing intervention or they were not, a condition which could not be hidden from those involved. Study personnel were also not blinded in any of the studies.

The groups in six of the seven RCTs were similar at baseline, however, in one study there were twice as many girls than boys in both groups, meaning gender could act as a possible confounding variable. Three studies did not report effect sizes and none of the studies precisely reported an estimate of intervention effects. Five studies reported all possible outcomes, while two did not assess important outcomes such as depression. The benefits of the RCTs outweighed the costs and risks and, importantly, all results can be applied to low SES student populations.

The three cohort studies recruited their samples appropriately and accurately measured exposure and outcome to minimise bias. One study cited all possible confounding variables and took account of these in the design and analysis, while two did not. Follow-up of subjects was completed in two of the studies, ranging from 12 to 18 months, while one study did a complete follow-up at post-test but no further follow-ups of participants. The reporting of results was sufficiently comprehensive in all the studies, although none of them reported confidence intervals. One of the studies produced evidence which contradicted that of other studies, and it gave possible reasons for this.

3.2 Overview of Studies

Ten studies met the inclusion criteria. All the studies were set in low-income schools. Eight of the studies were conducted in primary schools, whereby participants ranged in age from 6 to 13 years old, while two of the studies were conducted in secondary schools, with participants aged from 12 to 18 years. Seven of the studies were conducted in Australia, two in Ireland and one in Chicago in the USA. Sample sizes ranged from 62 to 1,170 participants. All studies were published between 2005 and 2019.

Intervention type varied across studies. The ‘MindOut’, ‘Positive Action’, ‘Cool Kids’ and ‘Aussie Optimism: Feelings and Friends’ interventions were each used in one study. One study looked at the effects of both the ‘Aussie Optimism: Optimistic Thinking Skills’ and ‘Aussie Optimism: Social Life Skills’ interventions. Two studies looked at the ‘Aussie Optimism: Positive Thinking Skills’ intervention while three studies looked at ‘FRIENDS for Life’. Details of each intervention can be found in Table S5. Various measures were used to measure anxiety, with some studies using more than one measure. The Depression, Anxiety and Stress Scale (DASS), the Behaviour Assessment System for Children and the Children’s Automatic Thoughts Scale (CATS) were used once. The Spence Children’s Anxiety Scale-Parent version (SCAS-P) was used three times, the Revised

Children's Manifest Anxiety Scale (RCMAS) was used four times and the SCAS children's version (SCAS) was used six times. A summary of each scale is provided in Table S6.

All ten studies provided some form of training to intervention facilitators, ranging in length from one day to sixteen hours. Interventions ranged from eight weeks to 35 weeks in length, with individual lessons varying in length from 15 minutes to one hour. Four studies did not conduct a follow-up, whereas six did with follow ups ranging from four months to 30 months in duration. Teachers delivered the intervention in each study apart from Mifsud and Rapee's [11] study, whereby school counsellors and mental health workers from local community mental health centres were trained to deliver the intervention, and Rooney et al.'s [47] study whereby two psychologists facilitated the interventions.

Four studies did not mention whether intervention fidelity checks were conducted. In Iizuka et al.'s [42] study, FRIENDS accredited coaches visited each classroom three times to support implementation of the programme and provide modelling demonstrations so teachers could learn to deliver the lessons with fidelity, however, no fidelity checks were carried out as it was assumed teachers were competent to deliver the lessons after these initial support lessons. Lewis et al. [43] measured schools on a variety of implementation indices, for example, teacher description of the amount and quality of intervention activities in the classroom and reported variability between schools with improvements over time. Pophillat et al. [44] asked intervention facilitators to self-monitor their implementation of the programme by completing a checklist and rating the content covered in each lesson. Independent integrity measures were also gathered through random observation of two of the two of the teachers delivering two separate modules. These combined measures provided an indication of implementation fidelity. Roberts et al. [45] conducted fidelity checks through the use of teacher logbooks, student workbook samples and blind independent observations of three randomly selected lessons per teacher. Rodgers and Dunsmuir [30] conducted a protocol integrity check to ensure fidelity of implementation. This involved a trained researcher viewing a videotape of different sessions and completing a checklist indicating compliance with the manual content. The integrity checks showed an 89% concordance between session and manual content. Rooney et al. [46] assessed fidelity using teacher logs, a trained researcher observing a random selection of lessons and an assessment of student workbooks and interviews at the end of the programme. The average content covered in each session was 95.6%.

3.3 Effectiveness of Wellbeing Interventions at Reducing Anxiety Levels

The first research question asked whether wellbeing interventions were effective at reducing the anxiety levels of children attending low-income schools. Five of the studies (50%) reported no significant intervention effect for generalised anxiety levels, while the other five studies found that wellbeing interventions were- effective at reducing the general anxiety levels of pupils. Effect sizes were calculated for studies which did not report these using an online effect size calculator. A 'Cohen's d' figure was found for each study by calculating the mean difference between pre-test and post-test anxiety scores and dividing the outcome by the pooled standard deviation. In Iizuka et al.'s [42] study, only those in the 'at risk' group experienced a significant decrease in anxiety and a small effect size was calculated for this group (d = -0.40). All other studies also had small effect sizes; Lewis et al. [43] (d = -0.26), Mifsud and Rapee [11] (d = -0.37) and Rodgers and Dunsmuir [30] (d = -0.47). Two separate anxiety measures were used in Stopa et al.'s [36] study, so an effect size

was calculated for each measure. Both the SCAS (d = -0.28) and the RCMAS (d = -0.25) had small effect sizes. As only half of the studies reported that wellbeing interventions were effective at reducing anxiety levels in low-income schools, we do not have a definitive answer to the first research question. Possible reasons for this are explored in the discussion section.

3.4 Sustainment of Reduced Anxiety Arising from Wellbeing Interventions

The second research question asked if any reductions in anxiety arising from engagement with wellbeing interventions were sustained in the long-term. Four studies [14, 42-44] did not conduct long-term follow ups of results. Three of the five studies which reported a reduction in anxiety at post-test conducted follow-ups, and all three reported that effects were maintained at follow-up, two after four month follow-ups [11, 30] and one after a 12 month follow-up [36]. This suggests that reductions in anxiety may be maintained up to one year after interventions conclude. Three studies which did not report a reduction in anxiety at post-test conducted follow-ups. There was no reduction in anxiety at six and 18 month [45], six, 18 and 30 month [46] and nine and 18 month [47] follow-ups. This suggests there was no evidence of delayed positive effects as anxiety did not reduce over time.

3.5 Impact of Gender on Wellbeing Interventions

The third research question sought to identify whether gender moderates the impact of interventions on anxiety levels. Four of the studies looked at the effect of gender on the intervention. Three of these reported that gender moderated intervention results, with Dowling et al. [14] and Stopa et al. [36] reporting a significant reduction in child-reported anxiety for females only, while Pophillat et al. [44] reported a significant decrease in parent-reported anxiety for males only. Rooney et al. [46] reported that gender did not moderate intervention effects. This provides modest support that gender may impact intervention effectiveness.

3.6 Qualities of Effective Interventions

The fourth research question sought to ascertain what the qualities of effective universal wellbeing interventions to reduce anxiety for students in low-income schools were. Pophillat et al. [44] and Dowling et al. [14] stated that interventions for low-income schools must be designed to meet the unique needs of target cohorts and be culturally relevant as well as developmentally appropriate. In addition, Dowling et al. [14] reported that their study demonstrated how intervention development, based on sound underlying programme theory, a common elements approach (evidence based transdiagnostic treatment approach deliverable by non-mental-health professionals), as well as stakeholder consultation can provide a usable and feasible set of evidence-based strategies. Strategies that could be successfully embedded into the curriculum as universal interventions to assist in anxiety reduction in lower income schools [14]. Moreover, findings from Rooney et al. [47], Rooney & Hassan [46], Lizuka et al. [42] and Dowling et al. [14] suggest that a universal school-based intervention format is superior to a smaller, more targeted group approach. However, Mifsud and Rapee [11] and Roberts et al. [45] suggest that though more targeted group formats are more costly for schools and are associated with stigmatisation, they do provide a more individualised intervention which may be useful in particular for high-risk students. Therefore,

Roberts et al. [45] suggest that perhaps adjunctive programmes running alongside universal programmes that target high-risk children may enhance intervention efficacy.

The fidelity to intervention programme content as well as the dose administered are also important intervention features for consideration. Pophillat et al. [44] suggest that programmes that are conducted in low-income schools in isolation rather than while they are simultaneously running other intervention programmes are more efficacious as higher demand on teachers may dilute efficacy. Roberts et al. [45] also note the importance of dose, reporting that the dose of the intervention programme received by the children in their study was low and thus hindered their intervention's efficacy.

In sum, the study findings indicate that important characteristics of efficacious interventions are that they are tailored to be culturally and developmentally appropriate, all relevant stakeholders are involved in the development, and fidelity to as well as dose of the intervention are carefully considered [14, 42, 44, 46, 47]. However, though the findings do point to the qualities of effective anxiety interventions in low-income schools it is plain that the varying reports of authors are not atoned, and further research is required to concretely answer this research question.

4. Discussion

The objectives of this review were to identify research that explores the impact of wellbeing interventions on the anxiety levels of students attending low-income schools, and to collate and summarise results using a narrative summary to draw key findings and list implications of results and highlight areas for further research. These objectives were achieved in the context of answering three research questions that considered whether wellbeing interventions are effective at reducing the anxiety levels of children attending low-income schools, whether positive outcomes were maintained and whether gender moderated the effect of interventions. Ten studies were included in the final synthesis. The main finding of the review was that school based wellbeing interventions are moderately effective for reducing the anxiety levels of children in low-income schools in some but not all studies. Second, in the case where anxiety is reduced, reductions are maintained several months after the interventions were administered. Third, the interventions appeared to have more impact on girls when girls reported their own anxiety, and more impact on boys when parents reported their sons' anxiety levels. Finally, wellbeing interventions administered to low-income student populations are most effective when their design targets the specific cultural and developmental characteristics of the population.

4.1 Impact of Wellbeing Interventions on Low-Income Pupils' Anxiety Levels

It appears that the efficacy of wellbeing interventions when implemented in low-income schools is variable. This contradicts much of the available evidence which supports the hypothesis that wellbeing interventions have numerous benefits for young people [4]. Some studies also provide evidence that wellbeing interventions lead to improved outcomes for students attending low-income schools, including reduced levels of hyperactivity, improved emotional literacy, an increased repertoire of coping skills [13], increased self-awareness, motivation and self-regulation and improved social skills [15].

There are several possible reasons for the mixed results arising from the studies included in this review. The first is that the wellbeing interventions might not culturally sensitive to the low SES

populations which they served, because the wellbeing interventions employed in the studies are universal school-based programmes. Wellbeing programmes need to be adapted and tailored to ensure that they are culturally appropriate to meet the needs of low-income student populations [14]. Clarke et al. [15] argue that understanding how interventions effect change, with who and under what circumstances change ensued is as important as determining whether any changes occurred. This involves looking at real-world constraints and factors within environments that affect the quality of intervention implementation. The unique culture and ethos of low-income schools mean there is a complex interaction of factors operating that are likely to impact on intervention effectiveness, perhaps helping to explain the varied and inconsistent results in this review.

The next possible reason for the disparity in results is the type of measures used. All the studies used some form of child self-report item to measure anxiety, and there can be validity issues with this measure. However, anxiety was also measured in some studies using parent and teacher report. There are often discrepancies between child and adult reports, with a lack of congruence between parent and child reports of anxiety common. In addition, participation of parents from low SES communities tends to be low, so it may be hard to gather meaningful data and draw reliable conclusions from this sample [30]. This could threaten the reliability and validity of studies and make interpretability difficult.

In addition, methodological variations between studies may have played a role in the different results obtained. Firstly, four studies did not report fidelity checks which is a significant limitation of the evidence base, as collecting and reporting fidelity data is for establishing whether unsuccessful outcomes are attributed to ineffective interventions, or a failure to implement the intervention as intended [48]. Next, eight of the studies included had teachers deliver interventions, while two had outside professionals deliver the interventions to students. Differences in the type of professional who implemented interventions may have contributed to differences in results. Finally, RCTs used different methods of randomisation which may have resulted in groups of different compositions [49], for example, some matched groups based on key characteristics such as SES while others did not. A lack of homogeneity in randomisation procedures may help to explain the discrepancies in results between the studies in this review.

Another possible reason for the variation in results may be the broad manner in which anxiety was conceptualised. One study showed changes in certain anxiety subtypes pre and post intervention, including separation anxiety, obsessive compulsive disorder and physical anxiety [42] while another showed a significant interaction effect for group and time for the separation anxiety subscale [30]. This suggests that interventions may not be effective at reducing overall anxiety levels, but they may impact on certain anxiety subtypes.

Higher levels of truancy [46] and school dropout rates, along with greater levels of mobility, are common among students from low SES backgrounds [50]. Higher rates of absenteeism mean students get less exposure to wellbeing interventions and this may weaken the observed effects on outcomes of anxiety [43]. In addition, students who moved schools or dropped out of school would not have been counted in post-intervention data collection. High rates of attrition may have impacted the reliability and validity of studies, making it difficult to draw accurate and meaningful conclusions.

4.2 Sustainment of Reduced Anxiety Levels

The review sought to investigate whether any reported reductions in anxiety would be maintained in the long term, and results suggest that reductions in anxiety are likely to be maintained at four month and twelve month follow-ups. This is consistent with previous reviews which indicate that positive results can be maintained up to one year after interventions conclude [3]. However, as only three of the five studies which reported reductions in anxiety at post-test conducted follow ups, there is not sufficient evidence to answer this research question with confidence. Three studies which did not report a reduction in anxiety at post-test conducted follow-ups, and no reduction in anxiety was observed over time. This contradicts research which suggests there may be delayed positive affects arising from intervention engagement, with stronger effect sizes emerging at follow-up periods in comparison with post-test measures [30]. As the longest follow-up study was twelve months, it is not possible to establish whether positive effects were maintained beyond this time period. Therefore, measures which ensure positive outcomes are not lost, such as the provision of booster sessions which revise key learning and strategies for pupils [45], should be utilised to ensure positive outcomes are maintained long after interventions conclude. In addition, the content of interventions must be analysed critically to ensure they are accessible for children, as effects will not be maintained if the cognitive component is too advanced or complex for children [46].

4.3 Impact of Gender on Intervention Effectiveness

Of the four studies which looked at the impact of gender on intervention outcomes, one showed no effect for gender; two showed a significant intervention effect on anxiety for females and one showed a decrease in parent-reported anxiety of the intervention group in males. Two studies highlighted that girls had higher levels of anxiety pre- and post-intervention than boys. This would be expected given that females are more likely to suffer with symptoms of anxiety than males [14] and boys are less likely to report anxiety than girls, meaning many boys suffering from anxiety may go undetected [36].

It is interesting to note the differential results based on the type of report used. The two studies which used child self-report measures showed an intervention effect for females, while the one which used a parent report measure showed an intervention effect for males. This is congruent with previous research which shows a poor agreement between parent and child reports, particularly in relation to internalising symptoms such as anxiety [44]. One study found that boys demonstrated significant decreases in social phobia post-intervention, meaning that boys could derive greater social confidence from wellbeing interventions than girls [36]. Further research is needed to discern whether one gender is likely to reap greater rewards from wellbeing interventions than another among populations attending low-income schools.

4.4 Implications and Directions for Future Research

The results arising from this review highlight several important implications for policy and practice and gaps which could be addressed in future research.

With regards to addressing gaps in the present literature, low-income school populations are underrepresented and need to be prioritised in future wellbeing intervention studies [14]. Further

research is needed into how interventions can be designed or adjusted to make them more accessible and effective for students attending low-income schools. In addition, future studies should try to address some of the methodological flaws in these studies, including low sample sizes, the lack of a control group, a failure to conduct follow-ups and over-reliance on self-report measures.

The results of this review provide moderate evidence for the effectiveness of wellbeing interventions as a mechanism for alleviating symptoms of anxiety in low-income school populations. This has important implications for educators as evidence indicates that young people from low SES backgrounds face increased risks of developing anxiety which is associated with several adverse outcomes. School management and staff have a responsibility to help alleviate this risk and to strengthen the wellbeing of their pupils. Wellbeing interventions can reach many young people, they do not demand additional resources and they remove the stigma that comes with identifying high-risk children for additional support [42]. Therefore, wellbeing interventions can act as a protective factor for anxiety and a variety of negative outcomes [14]. However, simply delivering interventions to students does not guarantee that there will be positive outcomes and educators need to be mindful of the factors, such as culturally insensitive programme content and gender, which may impact effectiveness.

This review also highlights a need for the emotional wellbeing of low SES students to be prioritised in national policy. This is already a reality in some countries, including Ireland where supporting the wellbeing of students attending low-income schools, was prioritised in national policy [51]. In comparison, a recent OECD report found the Australian education system to be one of the most unequitable in the world, with a PISA study revealing significant disparities in student outcomes relating to their SES [52]. This highlights the need for an international effort to prioritise low SES students, especially their mental health and wellbeing, as despite efforts and progress which have been made in recent years, more needs to be done.

4.5 Limitations

Several limitations exist in this review. Firstly, the selected studies only come from three different countries, with most studies from Australia. This may make the generalisability of findings to other countries more difficult. Secondly, due to the assumption of homogeneity of study characteristics not being satisfied, it was not possible to conduct a meta-analysis. Ideally, all papers would have been satisfactorily homogeneous to support the conduction of a meta-analysis, thus allowing a more in-depth statistical exploration of data and smaller effect sizes to be detected. Thirdly, each of the studies in this review have methodological and conceptual limitations which should be considered when interpreting the results of this review. For example, effect sizes were not reported in some of the studies which made it difficult to determine the impact of interventions and increased the risk of incorrect effect sizes being reported in this paper as the authors had to calculate effect sizes themselves. Finally, grey literature was excluded from the literature search in preference of peer reviewed articles. This may have resulted in publication bias as published research is more likely to report statistically significant findings, meaning effect sizes could be overestimated [53].

5. Conclusion

This systematic literature review sought to address a gap in the literature by exploring the impact of wellbeing interventions on the anxiety levels of children attending low-income schools. Results were mixed, with half of the studies indicating that wellbeing interventions reduced the anxiety levels of students attending low-income schools. Three of the five studies which reported a reduction in anxiety at post-test conducted follow-ups, and all three reported that effects were maintained at follow-up, either four or twelve months later. In addition, it appears that gender may moderate intervention effects, although the exact nuances of this are unclear, highlighting the need for further research. The results are tentatively optimistic in suggesting that wellbeing interventions have the potential to reduce the anxiety levels of low-income school students. Further research is needed to see how wellbeing interventions can be optimised to increase their efficacy for reducing anxiety levels amongst low SES students specifically, helping to improve the psychological wellbeing of this more vulnerable population.

Author Contributions

Tracy O'Halloran and Jennifer Symonds conceptualized the research. Tracy O'Halloran executed the systematic review and drafted the manuscript. Linda Bhreathnach and Jennifer Symonds completed the manuscript.

Competing Interests

The authors have declared that no competing interests exist.

Additional Materials

The following additional materials are uploaded at the page of this paper.

1. Figure S1: PRISMA Diagram Search Results.
2. Table S1: Included Studies.
3. Table S2: Sum of Outcome Measures, Primary and Secondary Outcomes for Each Study.
4. Table S3: CASP Quality Assessment of the Seven Randomised Controlled Trials Included in the Systematic Literature Review.
5. Table S4: CASP Quality Assessment Table of the Three Cohort Studies Included in the Systematic Literature Review.
6. Table S5: Intervention Description and Related Studies.
7. Table S6: Description of Anxiety Measures Used.

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