

DOCTORAL THESIS

Emotional Problems Among Children And Adolescents In Mauritius An Investigation Of Prevalence And Prevention

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**EMOTIONAL PROBLEMS AMONG CHILDREN AND ADOLESCENTS IN
MAURITIUS: AN INVESTIGATION OF PREVALENCE AND PREVENTION**

by

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*A thesis submitted in partial fulfilment of the requirements for the
degree of PhD*

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Abstract

Introduction

Emotional problems in childhood and adolescence are the most common mental health concerns affecting young people in low- and middle-income countries (LMICs). The frequent co-occurrence of emotional problems such as anxiety and depression with risk factors is often associated with negative outcomes and can cause significant impairments that tend to persist into adulthood. Children and adolescents experiencing elevated depressive or anxiety symptoms, but not fulfilling the criteria for a diagnostic mental health disorder, are often left without adequate treatment. Despite important mental health implications for youth however, limited to no research in LMICs such as Mauritius has documented the prevalence of emotional problems in order to inform preventative interventions for children and adolescents with emotional problems. This thesis aimed to close this gap by firstly assessing the prevalence of emotional problems in LMICs and Mauritius and secondly by adapting a transdiagnostic evidence-based intervention programme (i.e. Super Skills for Life) for prevention of emotional problems among vulnerable children and adolescents living in residential care institutions (RCIs).

Methods

To achieve these aims, four studies were conducted with a mixed-method research design. Study 1 examined the prevalence of emotional problems among children and adolescents in LMICs through a systematic review analysis of 43 studies ($N = 95,512$) across 20 LMICs. Study 2 specifically examined the prevalence of emotional problems and the associated risk factors among adolescents in Mauritius ($N = 818$). Study 3 examined the acceptability and feasibility of the SSL programme through a cultural adaptation of the intervention among a

sample of children and adolescents ($N = 36$) in RCIs. The findings of Study 3 led to a randomised controlled trial in Study 4 ($N = 100$) in order to examine the effectiveness of the SSL in reducing emotional problems and building emotional resilience among children and adolescents in RCIs.

Results

The prevalence of emotional problems across LMICs was found to be 41% with a similar prevalence rate of 32% among Mauritian adolescents who were at higher risk of emotional problems. The SSL was found to be acceptable and feasible through a cultural adaptation of the programme content, recruitment, procedures and research method design. The informed RCT study evidenced the effectiveness of the adapted SSL in reduction of emotional problems, behavioural problems, maladaptive emotion regulation strategies and inhibitory control following the SSL intervention and at follow-up. Across the studies, gender and emotion regulation strategies emerged as significant risk factors of emotional problems.

Discussion

Overall, the studies indicated that Mauritius is not devoid of emotional problems and young Mauritian people are in need of preventative interventions. The SSL is an effective evidence-based programme that can help reduce emotional problems and build the emotional resilience of the children and adolescents in RCIs. Collectively, the findings of this thesis have important implications regarding the prevalence and prevention of youth emotional problems in Mauritius. The outcomes and findings of the studies, a first of its kind, were reviewed with recommendations for future research of a similar nature.

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Dedication

...To the two angels I lost...

...And to the endless angels I got...

From your Maa

Declaration

Two chapters included in this thesis have been previously published:

Chapter 7:

Ramdhonee-Dowlot, K., Balloo, K., & Essau, C. A. (2021). Effectiveness of the Super Skills for Life programme in enhancing the emotional wellbeing of children and adolescents in residential care institutions in a low-and middle-income country: A randomised waitlist-controlled trial. *Journal of affective disorders*, 278, 327-338.

Chapter 5 and 6:

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Conference Presentations

Ramdhonee-Dowlot, K.S., Essau, C.A. & Balloo, K. (May 2021). Effectiveness of a cognitive behavioural therapy-based transdiagnostic programme for emotional problems in young people in residential care in a low- and middle- income country: A randomised waitlist-controlled trial. Online paper presented at *Roehampton Post Graduate Research Conference, The Age of Positive Disrupters*, University of Roehampton, London, UK.

Ramdhonee-Dowlot, K.S., Essau, C.A. & Balloo, K. (November 2019). Effectiveness of a transdiagnostic prevention programme (Super Skills for Life) in enhancing children's emotional wellbeing in residential care in a low- and middle-income country:

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Ramdhonee-Dowlot, K.S., Essau, C.A. & Balloo, K. (September 2019).

Effectiveness of a transdiagnostic prevention programme (Super Skills for Life) in enhancing children's emotional wellbeing in residential care in a low- and middle-income country:

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Ramdhonee-Dowlot, K.S., Essau, C.A. & Balloo, K. (July 2019). Prevention of emotional problems in institutional care children in Mauritius: Acceptability and Feasibility of the transdiagnostic programme, Super Skills for Life (SSL). Paper presented at the *14th International Conference on Child and Adolescent Psychopathology*, University of Roehampton, London, UK.

Ramdhonee-Dowlot, K.S., Essau, C.A. & Balloo, K. (July 2019). Effectiveness of the Super Skills for Life (SSL) programme in enhancing children's emotional well-being, emotional regulation and cognitive control: a randomized controlled trial study. Paper

presented at the *14th International Conference on Child and Adolescent Psychopathology*, University of Roehampton, London, UK.

Ramdhonee-Dowlot, K.S. & Essau, C.A. (August 2018). Effectiveness of the Super Skills for Life (SSL) programme in enhancing children's emotional wellbeing, social skills and cognitive control. Paper presented at *13th International Conference on Child and Adolescent Psychopathology*, Sarawak, Malaysia.

Chapter 1: Introduction

1.1. Context of the Thesis

Adolescence is a unique and formative period (WHO, 2018) often characterized by complex changes both mentally and physically (Moksnes, Byrne, Mazanov et al., 2010). Over the years, the transitional period from childhood to adulthood has been represented as a paradox in health terms, whereby the physical peak of health occurs during these years. Yet, it is also a risk period for the development of emotional problems. The World Health Organisation defines adolescence as occurring from ages 10 to 19 and is often divided into phases of early adolescence (10 to 14 years), middle adolescence (15 to 16 years) and late adolescence (17 to 19 years) (WHO, 2014). Over half of all lifetime emotional problems emerge during childhood and adolescence, and from age 14 to the mid-20s, two-thirds of all mental health issues will have appeared (Kessler, Amminger, Aguilar-Gaxiola et al., 2007; WHO, 2021).

The development of emotional problems during early adolescence is, therefore, particularly poignant, due to its potential impact on the young person's future. Adolescence is associated with a number of fundamental biological, cognitive, emotional and social changes, and is the period when young people forge an identity for themselves, develop relationships with their peers, and determine their long-term goals as an adult (Harrop & Trower, 2001). Disruption at this stage in the lifespan can have a severe and long-term impact on development, with the consequences of emotional issues during adolescence still being salient at age 30, leading to debilitating psychological and social outcomes (Essau, Lewinsohn, Lim et al., 2018; Essau, Torre-Luque, Lewinsohn et al., 2020; Gibb, Fergusson, & Horwood, 2010).

In fact, emotional illness is a leading cause of disability worldwide (Whiteford, Degenhardt, Rehm et al., 2013). Emotional symptoms limit an individual's psychosocial functioning, diminishes quality of life and is frequently associated with substantial burdens and costs not only for the individuals and their families, but also for society as a whole (Lim et al., 2018). The onset of emotional problems such as anxiety and depression has been found to occur during childhood and adolescence (Essau et al., 2018; Belfer, 2008a; Kessler et al., 2007; Kim-Cohen, Caspi, Moffitt et al., 2003; Rescorla, Achenbach, Ivanova et al., 2007; Rohde, Lewinsohn, Klein et al., 2013). Approximately 50% of youth affected by anxiety and depression first start experiencing difficulties before 11 years of age (Kessler, Chiu, Demler et al., 2005). Anxiety and depression are not only common, but they also tend to co-occur frequently and are comorbid with other mental health difficulties (Essau et al., 2018, 2020). For instance, up to 29% of emotional problems usually diagnosed in young children, such as anxiety and depression, often display characteristics that are also present in other mental health difficulties (Maj, 2005; Merikangas, Nakamura, & Kessler, 2009).

This burden of emotional problems is disproportionately borne by young people who not only account for up to 50% of the world's population, but 90% of the world's youth also live in low- and middle-income countries (LMICs) (United Nations, 2017), which have the least access to psychological services (Belfer, 2008b; Erskine, Moffitt, Copeland et al., 2015; Kieling, Baker-Henningham, Belfer et al., 2011; Leckman & Leventhal, 2008). Arguably, children and adolescents living in LMICs have increased vulnerability to mental health problems due to their social and environmental circumstances, such as increased rates of poverty, violence, war, natural disasters, as well as a lack of service providers and available medical and psychological treatment (Lund, Brooke-Sumner, Baingana et al., 2018; Patel, Saxena, Lund et al., 2016; Pedersen, Holen, Lydersen et al., 2019).

Unfortunately, mental health services in LMICs are limited, with many individuals unable to obtain appropriate information, treatment or help for their emotional problems (Patel, Xiao, Chen et al., 2016; Liang, Mays, & Hwang, 2018). In addition to the lack of available facilities and trained professionals, low perceived need, poor knowledge of symptoms of emotional problems, and mental illness stigma, have also been identified as potential barriers to help-seeking for emotional problems in LMICs (Getanda, O'Reilly & Vostanis, 2017; Patel et al., 2016). These circumstances not only increase the incidence of emotional problems in developing countries, but at the same time, they also divert limited resources to areas other than mental health (Rathod, Pinninti, Irfan et al., 2017). The implications of this trend for the young population of LMICs are therefore significant.

Emotional problems in childhood and adolescence have consequences that lead to a cost to both the individuals and society (Skogen, Smith, Aaro et al., 2018). From a psychological perspective, emotional problems have major personal costs, including reduced levels of social functioning in relation to family and friends, academic achievements and subjective wellbeing. While from a public health perspective, emotional problems have large economic costs related to treatment, medical and psychological care, and reduced work capacity later in life.

1.2. The Current Research

1.2.1. Gaps in the Knowledge

Despite more pronounced mental health vulnerabilities for young people in LMICs, most of the literature on emotional problems has emerged from high-income countries (Rathod et al., 2017; Sashidharan, White, Mezzina et al., 2016). Subsequently, there is a lack of knowledge regarding types of emotional problems and the prevalence of emotional problems among young people living in LMICs. Indeed, the absence of accurate estimates is

widening the mental health treatment gap in LMICs (Kleintjes, Lund & Fisher, 2010; Patel, Kieling, Maulik et al., 2013; Vostanis, Eruyar, Haffejee et al., 2021). Evidence for the scaling up and sustainability of mental health promotion interventions in LMICs needs to be strengthened (Barry, Clarke, Jenkins et al., 2013). An indication of the prevalence of emotional problems will inform and challenge existing child/adolescent mental health care provisions, and aim to bring systemic changes to the prevention of emotional problems by introducing more accessible, evidence-based and culturally-appropriate interventions in LMICs, while aiming to improve outcomes for emotional problems (Rathod, Persaud, Naeem et al., 2020). There is a need for further studies on different cultural backgrounds in LMICs to grasp the phenomena of emotional problems among young people. In particular, from the time of this thesis commencement to the end, a review of the literature has highlighted that there is no research data available on emotional problems in the LMIC island of Mauritius. Empirical evidence is therefore needed to understand emotional problems, the prevalence and associated risk factors in this culture, and ensure that local services adequately cater for the mental health needs of the young people of Mauritius.

1.2.2. Key Contributions of the Thesis

By addressing the above, this thesis will make an original contribution to knowledge by examining firstly, the prevalence of emotional problems across LMICs and then specifically in the LMIC of Mauritius. It is considered imperative in acquiring accurate prevalence rates that could inform research and intervention priorities in the youth population in LMICs. Secondly, this thesis will then examine the possibility of adapting a transdiagnostic cognitive behaviour therapy-based intervention (i.e. Super Skills for Life) for the prevention of emotional problems among children and adolescents in Mauritius. The evaluation of interventions in a previously unresearched culture is challenging because

numerous factors can hinder the implementation of an experimental design and delivery of the intervention as planned. A feasibility study provides researchers with an invaluable opportunity to identify these challenges before conducting a full-scale randomised controlled trial (RCT). Since an RCT is the most reliable evidence of the effectiveness of an intervention, evidence that a procedure is feasible will be invaluable (Gardner, Gardner, MacLellan et al., 2003). To the best of knowledge, this will be the first study to explore the prevalence and risk factors of emotional problems among young people in a previously unstudied LMIC country.

In addition to contributing original knowledge to the field of youth emotional problems, findings from this thesis could also have significant practical and policy implications. This can further aid the Mauritian authorities in working towards helping prevent or treat emotional difficulties in young people specific to their settings. A greater understanding of youth emotional problems in Mauritius would ensure local services and professionals gain better knowledge and training in preventing and reducing the negative consequences of emotional problems. Moreover, understanding the risk factors that could be associated with emotional problems could allow at-risk children and adolescents to be easily identified and referred to appropriate prevention programmes or other mental health treatment.

1.3. Aims of the Thesis

The current thesis, comprised of four studies, will aim to address the identified gaps in the literature. The first two studies are designed to advance the understanding of emotional problems in LMICs in general and then specific to Mauritius. Risk factors that can contribute to risk of emotional problems will also be explored. The last two studies are designed to advance knowledge into the feasibility and effectiveness of an evidence-based programme,

the Super Skills for Life (SSL), in the prevention and treatment of emotional problems among children living in clinical settings, that is, residential care institutions (RCIs).

The specific aims of this thesis are to:

- i. Conduct a systematic review analysis to examine the prevalence of emotional problems among children and adolescents living in LMICs (Study 1: Chapter 4).
- ii. Explore the prevalence of emotional problems among children and adolescents in Mauritius (Study 2: Chapter 5).
- iii. Examine the risk factors associated with emotional problems (Study 2: Chapter 5).
- iv. Explore the cultural adaptation, acceptability and feasibility of a transdiagnostic intervention programme, the SSL, in the prevention and treatment of emotional problems among children and adolescents living in local RCIs (Study 3: Chapter 6).
- v. Examine the efficacy of the SSL as a transdiagnostic intervention programme in enhancing the emotional wellbeing of young people living in local RCIs (Study 4: Chapter 7).

1.4. Overall Research Design of the Thesis

This thesis adopts a mixed-methods design, using both qualitative approaches, such as semi-structured interviews, focus group discussions and a systematic review synthesis and quantitative approaches, such as survey research and experimental intervention design. Table 1 summarises the research methods used throughout this thesis. Four studies were conducted in this thesis. Study 1 focuses on a systematic review analysis of emotional problems in young people living across LMICs. The design and performance of this investigation follows recommendations for the preferred reporting items for systematic reviews analyses (PRISMA) (Moher, Liberati, Tetzlaff et al., 2009). The use of this method combines existing

research findings to help determine if any prevalence of emotional problems can be drawn from the youth population in LMICs.

Study 2 uses a survey method to examine the prevalence of emotional problems specifically in Mauritius, and to explore their association with risk factors such as sleep quality, quality of lifestyle and emotion regulation. For this purpose, a set of self-report questionnaires are used. This study helps determine the frequency of emotional problems in adolescents and also identify those who are at greater risk for emotional problems. The study also deduces if any emergence of prevention of emotional problems in Mauritius is warranted. Study 3 uses a mixed-method design to evaluate the acceptability and feasibility of a transdiagnostic intervention programme for the prevention and treatment of emotional problems. The use of a mixed-method design helped to examine the feasibility of the programme and treatment outcome design and helped determine if a randomised controlled trial could be conducted. Study 4 specifically focuses on treatment evaluation and efficacy of the transdiagnostic CBT-based intervention in reducing emotional problems. A pre-post and follow-up research design of the study is carried out to examine the treatment outcomes of the intervention group against a waitlist control group.

Table 1.

Summary of Research Methods used in the Thesis

Study	Topic	Design	Data Collection Method
Study 1: Chapter 3	Prevalence of emotional problems in LMICs	Systematic Review	Systematic Analysis
Study 2: Chapter 4	Prevalence of emotional problems in Mauritius	Epidemiological	Survey

Study 3: Chapter 6	Acceptability and Feasibility of transdiagnostic CBT-based intervention on emotional problems	Mixed-Method: Qualitative and Quantitative	Treatment adaptation using semi-structured interviews, focus group discussions and survey
Study 4: Chapter 7	Efficacy of transdiagnostic CBT-based intervention on emotional problems	Experimental: Randomised Waitlist-Controlled Trial	Treatment evaluation using outcome measures (survey and computerised tasks)

1.5. Outline of the Thesis

Chapter 1 has provided a general overview of the thesis, including the context of the research and the research aims.

Chapter 2 is a literature review chapter on emotional problems of anxiety and depression. Risk factors associated with emotional problems of anxiety and depression are discussed further.

Chapter 3 (Study 1) is a systematic review chapter investigating the prevalence of emotional problems among children and adolescents in Low- and Middle-Income Countries.

Chapter 4 (Study 2) is an epidemiological study chapter investigating the prevalence of emotional problems among adolescents in the Low- Middle-Income Country of Mauritius.

Chapter 5 is a literature review chapter on Cognitive Behaviour Therapy interventions for the treatment and prevention of emotional problems in Low- and Middle-Income Countries.

Chapter 6 (Study 3) is a mixed-method study chapter examining the cultural adaptation, acceptability and feasibility of the intervention programme, Super Skills for Life (SSL), among children and adolescents in Residential Care Institutions of Mauritius.

Chapter 7 (Study 4) is a randomised waitlist-controlled trial study examining the effectiveness of the Super Skills for Life (SSL) programme in enhancing the emotional wellbeing of children and adolescents in Residential Care Institutions in Mauritius.

Chapter 8 is a general discussion chapter that synthesises and discusses the findings of the four studies. Limitations of the thesis, the strengths and implications of the findings are discussed further.

Chapter 2: Emotional Problems: A Literature Review

2. Overview

This chapter aims to introduce the topic of emotional problems. Firstly, a general introduction to the subject of emotional problems among children and adolescents is given, along with definitions and types of emotional problems typically experienced during childhood and adolescence. The next section explores the key cognitive risk factors of emotional problems such as emotion regulation and cognitive biases. Finally, the chapter synthesises the key theoretical perspectives and literature that has been used to inform the aims of this thesis.

2.1. Definitions of Emotional Problems

“Emotional problems” is a higher-order construct related to the more general concept of psychopathology in childhood and adolescence (Kovacs & Devlin, 1998). It refers to symptoms of anxiety and depression, such as sadness, loneliness, worrying, feelings of worthlessness and anxiousness. In this thesis, the construct of emotional problems will be used interchangeably with the construct of “internalising problems”. Moreover, measures of anxiety and depressive symptoms used in this thesis are based on criteria from the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) (APA, 2013). In this diagnostic system, the core symptoms of most anxiety and depressive disorders are essentially viewed as being similar in childhood, adolescence and adulthood. However, the application of adult criteria to children and adolescents has been questioned, and age appropriate guidelines that are sensitive to developmental changes are therefore needed (Weiss & Garber, 2003).

Depression is described as a negative affective state, ranging from unhappiness and discontent to extreme feelings of sadness, pessimism, or despondency that interferes with daily life (APA, 2020). More specifically, the core symptoms of depression for children and adolescents include: 1) an irritable or depressed mood – feelings of sadness or emptiness; 2) diminished interest or pleasure in nearly all activities; 3) significant and unexpected changes in weight and appetite; 4) somatic complaints – insomnia or hypersomnia; 5) psychomotor agitation or retardation; 6) loss of energy or fatigue; 7) feelings of worthlessness or excessive guilt; 8) impaired concentration or indecisiveness; and 9) recurrent thoughts of death or suicidal thoughts, ideation or attempt (DSM-5). Anxiety is an emotion characterised by apprehension and somatic symptoms of tension in which an individual anticipates a future concern, impending danger, or catastrophe, and it is often associated with muscle tension and avoidance behaviour (APA, 2020). According to DSM-5, the main categories of anxiety disorders include separation anxiety disorder, selective mutism, specific phobia, social anxiety disorder (social phobia), panic disorder, agoraphobia, generalized anxiety disorder, substance/medication-induced anxiety disorder, and anxiety disorder due to another medical condition.

2.2. Emotional Problems in childhood and adolescence

During the period of flux from childhood to adolescence, the young brain undergoes a period of intense maturation in areas such as cortical thickness, surface area and volume (Tamnes, Herting, Goddings et al., 2017). In addition to structural development, regions of the brain which underlie cognitive processes such as reasoning, information processing, abstract thinking, planning, regulation of behaviour and emotion, as well as arousal and motivation, are also gaining functional maturation during this period (Andrews, Ahmed & Blakemore, 2020). However, these maturing changes are associated with substantial variation

between adolescents and one possible source of individual variation may relate to puberty (Mills, Goddings, Clasen et al., 2014; Vijayakumar, Op de Macks, Shirtcliff et al., 2018). The progression through pubertal development is marked with neural and psychosocial changes which have demonstrated associations with mental health vulnerabilities (Pfeifer & Allen, 2021). Hence, each young person undergoes a unique developmental timeline, not only making adolescence a time of opportunity, but also that of risk and vulnerability to emotional problems (Blackmore, 2019).

It is perhaps unsurprising that adolescence confers one of the highest risk periods for the development of emotional problems, given the greater experience of affective fluctuations and higher levels of negative mood during the adolescent phase (Riediger, Wrzus, Schmiedek et al., 2011) The transition phase from childhood to adolescence is often marked by the emergence of negative affectivity – a key risk factor for the development of emotional problems such as anxiety and depression (Cuijpers, Smit, Penninx et al., 2010; Lahey, 2009; Letcher, Smart, Sanson et al., 2009). It is important to acknowledge that negative emotional experiences such as feelings of anxiety, stress, irritability or sadness are not in themselves maladaptive, but are developmentally normal human emotions (Pass, Mastroyannopoulou, Coker et al., 2017). For instance, the evolutionary adaptive emotion of anxiety facilitates an individual's response to potential threats in the environment (Bar-Haim, Lamy, Pergamin et al., 2007). However, a substantial minority of children and adolescents find these affective experiences as challenging to regulate. When the experiences of negative emotions become prolonged and severe, with difficulty in affective control, they can cause the emotions to become maladaptive and harmful (Schweizer, Gotlib & Blakemore, 2020). These experiences can lead to a selective and narrow internal focus that dominates all information processing or communication channels (Keenan 2000; Southam-Gerow & Kendall, 2002).

In fact, emotional problems of anxiety and depression are the most common psychological difficulties experienced in childhood and adolescence (Merikangas, He, Burstein et al., 2010; Polanczyk, Salum, Sugaya et al., 2015). Heightened levels of anxiety and depressive symptoms during both of these developmental epochs impact social, emotional, and academic development (Costello et al. 2003; Garber & Horowitz 2002; Rapee et al. 2009; Rudolph, 2014). An inability to successfully navigate developmental challenges in childhood and adolescence can lead to a reorganisation of biological and psychological factors that subsequently sets the foundation for emotional problems (Cicchetti and Toth, 1998). These reorganisations can impact the expression (i.e., the overt manifestation of symptoms of distress) and trajectory (i.e., the longitudinal course of symptoms) of emotional difficulties over time.

Longitudinal studies (e.g. Castagnini, Foldager, Caffo et al., 2016; Copeland, Wolke, Shanahan et al., 2015; Essau, Lewinsohn, Olaya et al., 2014a; Essau, Torre-Luque, Lewinsohn et al., 2020) have evidenced that emotional disorders first diagnosed in early childhood, increase the risk of adverse outcomes in adolescence and in adulthood three-fold, compared to disorders with later onset, and can develop into chronic pathologies. Importantly, emotional problems in childhood seem to have a strong predictive value for problems in late adolescence (Stoolmiller, Kim, & Capaldi, 2005). Moreover, sub-threshold levels of emotional problems in early adolescence put youth at heightened risk for psychiatric disorders later in life (Fergusson, Horwood, & Boden, 2006; Clark, Rodgers, Caldwell et al., 2007). The long-term outcome for children and adolescence with emotional problems is concerning as there is evidence of continuity of child psychopathology into adulthood (Essau, Sasagawa, Lewinsohn et al., 2018; Kim-Cohen, Caspi, Moffitt et al., 2003; Merikangas et al., 2010).

The strong continuity of emotional problems may relate to the frequent co-occurrence (i.e. comorbidity) between anxiety and depressive symptoms among children and adolescents (Garber & Weersing, 2010; Muris, Mannens, Peters, & Meesters, 2017), with evidence of comorbidity rates being as high as 82% in high-income countries (Cummings, Caporino & Kendall, 2014; Romero, Canals, Hernandez-Martinez et al., 2010). Comorbidity typically refers to the presence of two or more distinct, co-occurring disorders in one person simultaneously (Klein & Riso, 1993). Comorbidity between anxiety and depression is a common presentation in children and adolescents (Melton, Croarkin, Strawn et al., 2016). Comorbidity has consistently been associated with greater symptom and diagnostic severity and higher illness severity, chronicity, and impairments in everyday life (Essau et al., 2020; Melton et al., 2016; Queen & Ehrenreich-May, 2014). By increasing symptom severity, comorbidity may predict worsening of global functional status (e.g. poorer academic performance, increased familial conflict), increased substance abuse risk and suicide attempts, relationship problems in later life, and impaired social skills (Beidel, Turner, Young et al., 2007; Wadsworth, Hudziak, Heath et al., 2001; Woodward & Ferguson, 2001).

The presence of comorbid emotional problems is not only associated with a higher level of psychological distress but also with a higher need for mental health services (Essau & de la Torre-Luque, 2019). Being internalised in nature, depression and anxiety are frequently unrecognised, misdiagnosed or untreated (Albano, Chorpita & Barlow, 2003) and this can lead to a greater mental health burden of disease and psychosocial impairment in various life domains in adulthood (Clark et al., 2007; Essau et al, 2014; Fergusson et al., 2006). When left untreated, emotional problems that begin early in life tend to be chronic and have a negative course, adding to the healthcare burden and leading to an overall worse outcome in adulthood and quality of life (Essau et al., 2014, 2018; Costello, Copeland & Angold, 2011; Hofmeijer-Sevink, Batelaan, van Megen et al., 2012). Hence, the chronic

nature of the symptomatic manifestations and its impact in current and later life can exacerbate the youth emotional burden.

2.3. Assessment of Emotional Problems

The classification of emotional problems may be done by using either a dimensional or a categorical approach depending on the purpose required (Kraemer, et al., 2004). The categorical classification identifies individuals suffering from mental disorders, which is important for clinical planning of treatment. However, the occurrence of comorbidity of emotional problems, as discussed above, questions the validity of the categorical approach (Alonso, Angermeyer, Bernert et al., 2004; Kessler et al., 2005). The issue with the categorical approach is the need to define clear-cut thresholds between presence and absence of disorders (Angst & Merikangas, 2001). For instance, studies have shown that conditions below cut-off thresholds of both depression and of anxiety problems have significant clinical relevance in terms of functional impairment, mortality, treatment, and prognosis (Bjelland, Lie, Dahl et al., 2009; Shear, Bjelland, Beesdo et al., 2007). Experts have suggested that emotional problems of anxiety and depression are best described within a dimensional approach (Shear et al., 2007; Andrews, Brugha, Thase et al., 2007). Such approaches are considered as valid alternatives to categorical diagnoses for anxiety and depression as they appear to have greater reliability than discrete diagnoses, both between raters and across time (Eaton, Keyes, Krueger et al., 2012). A dimensional approach also seems to map more closely biopsychosocial processes and genetic and environmental vulnerability factors (Weinberg, Kotov & Proudfit, 2015). Having the potential to better reflect the dimensionality and comorbidity of anxiety and depression, the transdiagnostic framework gained support for the prevention and treatment of mental health problems (Dalglish, Black, Johnston et al.,

2020). Transdiagnostic interventions are considered as the modal presentation in real-world services, with improved clinical effectiveness (Ellard, Fairholme, Boisseau et al., 2010).

2.4. Emotional Problems and Cognitive Risk Factors

2.4.1. Emotional Problems and Cognitive Emotional Regulation

Children, even at young ages, are capable of regulating their emotions. By the time they reach preschool age, they have often built a large repertoire of behavioural strategies to manage their own moods (Zeman & Shipman, 1996), and this ability increases further when they reach adolescence (Zeman et al., 2006). The transitional period from childhood to adolescence is marked by hormonal, neurological and developmental changes with an opportune time for regulatory skills to be cultivated and honed (Silk et al., 2003). These changes directly impact emotionality while affecting both the valence and intensity of negative and positive emotions (LeBlanc, Essau, & Ollendick, 2017). It is argued that, during adolescence, emotion regulation becomes a key cognitive process to effectively manage mood states after experiencing stressful events or negative emotions (Garneski, Kraaij, & Spinhoven, 2001; Van den Heuvel, Stikkelbroek & Bodden et al., 2020). Not surprisingly, in the typical daily life of older children and adolescents, both extreme mood states (both positive and negative) (Larson, Moneta, Richards, & Wilson, 2002; Larsen et al., 2013) and inabilities to regulate emotions have been observed (Zeman et al., 2006). Hence, developing awareness and understanding of one's emotions, as well as the processes that influence emotional regulation, is a critical developmental task for children and adolescents.

Despite decades of pioneering theoretical efforts, consensus over a single definition of emotion regulation has been difficult (Cole, Martin, & Dennis, 2004). Some definitions of emotion regulation concentrate more on the mechanisms and processes involved in regulating

one's emotions. For instance, Gross (1998) defines emotion regulation as the processes that influence which emotions individuals experience, as well as when and how they express these emotions. Moreover, Gross argued that both positive and negative emotions can be regulated, and that regulation can occur without conscious awareness. Thompson (1994) suggested that emotion regulation includes both extrinsic and intrinsic processes that aid in monitoring, evaluating, and modifying emotional responses in order to achieve one's goals. These processes include regulating emotional arousal through enhancement and maintenance as well as inhibition of emotional arousal, and at the same time, regulation efforts can impact the intensity and duration of experienced emotions. Eisenberg and Spinrad (2004) argued that any attempt at altering or regulating emotion is a feature of emotion regulation, despite the likelihood of success in the outcome. Hence, any consequent strategies that emerge are considered to be goal directed, whether triggered by conscious, unconscious, automatic or effortful processes (Gross & Thompson, 2007; Thompson, 1994). Despite different conceptualizations of emotion regulation, all definitions of emotion regulation emphasize that the ability to successfully coordinate one's emotions with the varying environment stressors, is essential to adaptive functioning (Durbin & Shafir, 2008).

However, Garnefski, Kraaij, and Spinhoven (2001) argued that years of research has not recognised the cognitive component of emotion regulation which helps individuals manage or regulate emotions or feelings to avoid becoming overwhelmed. The concept of cognitive emotion regulation can be understood as mentally handling the intake of emotionally arousing information (Thompson, 1991). Moreover, it is the ability to change expression, perception and experience of affective responses (Gross, 1998) in order to respond appropriately to environmental demands and achieve desired goals (Nolen-Hoeksema, 2012). Importantly, emotion regulation and development are closely-intertwined and they simultaneously undergo profound changes during the transition from early

childhood to adolescence (Eisenberg, Spinrad, & Eggum, 2010; Gross 2013; Thompson & Goodman, 2010).

During early life, that is, infancy and toddlerhood (0–2 years), emotions are primarily regulated on an external and behavioural level via crying and parental support and hence mainly characterized by extrinsic influences provided by the caregiver (Eisenberg et al. 2010; Stegge & Meerum-Terwogt, 2007; Thompson & Goodman, 2010). Transitioning into the preschool years (3–5 years), intrinsic processes gain prominence, as well as social, interpersonal, and cultural factors (Riediger & Klipker, 2014; Thompson & Goodman, 2010). From middle childhood (6–12 years) onwards, neurological advances, such as the development of executive functions, facilitate a more profound awareness and management of emotions (Lane, Quinlan, Schwartz et al., 1990). During the transition from childhood to adolescence (13–18 years), the cognitive concepts become more internal, leading to profound implications for the psychological development of youngsters (Aldwin, 2009; Sameroff, 2010; Steinberg, 1999). This is because important features of adolescent thinking require abilities to consider things in hypothetical and abstract terms and to monitor one's own cognitive activity during the process of thinking. During adolescence, cognitive processes that are crucial in emotion regulation, namely in the domain of high-level executive functions and social processes (e.g., working memory, inhibitory control, abstract thought, decision making and perspective taking), are subject to significant development (Blakemore & Robbins, 2012; Dumontheil, 2014; Somerville & Casey, 2010). These neurobiological achievements are reflected in the increasing use of cognitive and behavioural strategies (e.g., cognitive reappraisal, problem solving; Riediger & Klipker, 2014; Thompson & Goodman, 2010).

Cognitive processes have very important roles in maintaining adolescents' capabilities to manage or regulate their emotions or feelings, and to be able to keep control over emotions

and/or not getting overwhelmed by them, for instance, during or after the experience of threatening or stressful events (Domaradzka & Fajkowska, 2018). Although the capability of advanced thinking and regulating emotions through thoughts and cognitions is universal, large individual differences exist in the amount of cognitive activity and in the content of thoughts of adolescents by means of which they acquire the appropriate skills to regulate their emotions in response to life experiences, events and stressors (Zeman, Cassano, Perry-Parrish et al., 2006). The success of emotion regulation depends on the adaptation of responses to situational demands (Cole, Martin, & Dennis, 2004) and the development of emotional regulation strategies which intricately interact with genetics, biology, cognition, temperament, social environment, and learning (Thompson & Goodman, 2010).

Importantly, the regulation of emotions not only plays an important role in children and adolescents' adaptive development, for example, executive cognitive functions and social competence (Blair & Diamond, 2008; Monopoli & Kingston, 2012), but also in the development of psychopathology (Compas, Jaser, Bettis et al., 2017). Research suggests that specific cognitive factors are of particular importance in the context of internalizing psychopathology, that is, difficulties with emotion regulation may confer greater risk for internalising problems such as anxiety and depression (Steinberg & Avenevoli, 2000; Steinberg, Dahl, Keating et al. 2006). Specific cognitive difficulties such as decreased awareness, poor understanding, inappropriate expression and difficulty managing emotions have been associated with anxiety and depression in samples of youngsters (McLaughlin et al., 2011; Zeman et al., 2002, 2006; Southam-Gerow & Kendall, 2000). Specifically, adolescents with anxiety and depression display poorer emotional awareness, greater emotional suppression, greater reluctance to express negative emotions, and greater inhibition of sadness than adolescents with anxiety symptoms only (Queen & Ehrenreich-May, 2014).

Research has also indicated an altered emotion regulation in individuals with comorbid anxiety symptoms such as social phobia and depression (Burklund, Craske, & Taylor, 2015).

The experience of internalizing symptoms has been linked to temporal features of children's emotion regulation including the frequency, duration, intensity, and recovery of expressed emotions (Guyer, Silk, & Nelson, 2016). More precisely, children in fourth and fifth grades with internalizing symptoms have been found to have a higher level of fear emotionality (Rydell, Berlin, & Bohlin, 2003). Children aged five to eight years with internalizing symptoms have been found to be more likely to express their anger and sadness in ways that are excessive but not constructive (Zeman, Shipman, & Suveg, 2002). In addition, depressive symptoms from early- to mid-adolescence have been linked to experiences of greater lability with higher intensity of sadness, anger, and anxiety (Silk, Steinberg, & Morris, 2003). Children and adolescents, aged eight to sixteen years, with depressive symptoms, display difficulties inhibiting the processing of negative emotional information in order to concentrate on another task (Ladouceur, Dahl, Williamson, Birmaher, Ryan, & Casey, 2005). In adolescent samples, as compared to non-anxious participants, anxious participants have reported decreased emotional understanding, inhibited expression of emotions, difficulty managing negatively-valenced emotions, and less self-assurance in their ability to manage emotions (Klemanski, Curtiss, McLaughlin et al., 2017; Kranzler, Young, Hankin, Abela et al., 2016; Spokas, Luterek, & Heimberg, 2009). Hence, given the difficulty in emotional regulation, children and adolescents with anxiety and depressive symptoms may process emotional information and events in a biased way.

2.4.2. Emotional Problems and Cognitive Emotion Regulation Strategies

Cognitive emotion regulation strategies are conscious mental ways of coping with the intake of emotionally arousing information that individuals use to regulate their emotions in

response to life stress (Garnefski, Koopman, & Kraaij, 2009). Previous research has distinguished between nine conceptually different cognitive emotion regulation strategies that adolescents may use to regulate their emotions after having experienced a negative event: Self-blame; Other-blame; Rumination; Catastrophizing; Putting into Perspective; Positive Refocusing; Positive Reappraisal; Acceptance; and Planning (Garnefski, Kraaij, & Spinhoven, 2001, 2002). *Self-blame* refers to the focus on emotions and thoughts linked to one's own guilt. *Other-blame* refers to thoughts in which guilt experienced for the situation is attributed to other people. *Acceptance* refers to thoughts related to the acceptance of the event, which could favour a functional coping response. *Focus on planning* is related to those thoughts aimed at controlling and modifying the negative situation experienced. *Positive refocusing* consists of thinking of positive situations instead of the displeasing event that has occurred. *Rumination* consists of focusing on the thoughts and feelings associated with the negative event. *Positive reappraisal* involves perceiving the negative event as an opportunity for personal growth. *Putting into perspective* refers to thoughts about the importance of the current event that are diminished through comparison and relativism with other similar events, and *catastrophization* implies the exaggeration of the severity of the event experienced. These strategies are usually classified as either adaptive or maladaptive (Stikkelbroek, Bouden, Kleinjan et al., 2016). Self-blame, other-blame, rumination, and catastrophization are considered as maladaptive strategies, and these strategies can lead to psychological and emotional problems such as anxiety, depression and/or risky behaviour (Garnefski et al., 2009). Acceptance, planning, positive refocusing, positive reappraisal and putting into perspective are considered as adaptive strategies that are often related to better mental health and well-being (Extremera & Rey, 2014).

Research has consistently shown that the most frequent maladaptive cognitive emotion regulation strategies of catastrophizing (Garnefski & Kraaij, 2007; Min, Yu, Lee et

al., 2013; Rodríguez-Menchón, Orgilés, Fernández-Martínez et al., 2021), rumination (McLaughlin, Hatzenbuehler, Mennin et al. 2011; Rodríguez-Menchón, Orgiles, Fernandez-Martinez et al., 2021; D'Avanzato, Joormann, Siemer et al., 2013), and self-blame (Martin & Dahlen, 2005; Garnefski & Kraaij, 2007; Rodríguez-Menchón et al., 2021) are strongly related to anxiety. Likewise, the same maladaptive cognitive emotion regulation strategies of rumination (Joormann & Gotlib, 2010; Legerstee, Garnefski, Jellesma et al., 2010; Van Loey, Oggel, Goemanne et al., 2014), catastrophizing (Garnefski & Kraaij, 2006; Legerstee et al., 2010; Min et al., 2013), and self-blame (Garnefski et al., 2004; Legerstee et al., 2010; Kraaij, Garnefski & Van Gerwen, 2003) are also strongly related to depression.

The adaptive cognitive emotion regulation strategy of positive reappraisal has consistently been found to be inversely related to internalizing symptomatology (Garnefski & Kraaij, 2007; Joormann & Gotlib, 2010; Wang, Yi, He et al., 2014). In youth samples, higher depressive and anxiety symptoms have been associated with a less frequent use of positive reappraisal (Eastabrook, Flynn, & Hollenstein, 2014; Lanteigne, Flynn, Eastabrook et al. 2014; Legerstee et al., 2010). Moreover, some studies suggest that self-blame (e.g. Garnefski & Kraaij, 2007), other-blame (Garnefski et al., 2002a), positive refocusing (e.g. Wang et al., 2014), and refocus on planning (e.g. Min et al., 2013) also play a role in emotion problems (self- and other-blame—positively; positive refocusing and refocus on planning—negatively). For instance, strong links between the maladaptive ER strategies and specific anxiety and depression have been found and the adaptive ER strategies were found to contribute to resilience in individuals with depressive and anxiety symptoms. A few studies also point to acceptance as being positively connected to internalising symptoms of anxiety and depression, with higher levels of acceptance associated with lower levels of depressive and anxiety symptoms (Braet, Theuwis, Durme et al., 2014; Martin & Dahlen, 2005; Weinberg & Klonsky 2009).

Dochnal, Vetro, Kiss et al. (2019) reported that the presence or absence of anxiety and depression comorbidity in young patients had no significant impact on the use of adaptive ER responses across their two participant groups (comorbid and anxiety-only groups). These results are in line with those of Aldao et al. (2010), whose meta-analysis found that adaptive ER strategies were less associated with depression and/or anxiety, than were maladaptive ones among adults. In this respect, the results differ from a recent meta-analysis by Schäfer, Naumann, Holmes et al., (2017). They found empirical support for the link between emotion regulation strategies and depressive and anxiety symptoms in adolescence, as all emotion regulation strategies were significantly related to depressive and anxiety symptoms. Moreover, both the less frequently used adaptive emotion regulation strategies, and the more frequently used maladaptive emotion regulation strategies, were found to be crucial for psychopathological outcomes (Braet, Theuwis, Van Durme et al., 2014; Schäfer et al., 2017). The negative associations between adaptive emotion regulation strategies and psychopathologies indicates that adolescents with comorbidity may derive benefits from expanding their repertoires of adaptive emotion regulation responses. Adaptive emotion regulation strategies may be protective against psychopathological symptoms as they enable the individual to adequately cope with emotionally challenging situations which are frequent in adolescence (Braet et al., 2014; McLaughlin et al. 2011). Therefore, adolescence may constitute a critical time period to boost the use of adaptive emotion regulation strategies.

Altogether, the absence of adaptive strategies and the presence of maladaptive strategies have been linked with psychological adjustments, such as anxious and depressive symptoms, anger and distress (Garnefski & Kraaij, 2007; Aldao & Nolen-Hoeksema, 2010) and different forms of psychopathology (Fletcher, Parker, & Manicavasagar, 2013). The frequent use of maladaptive rather than adaptive strategies is indisputably more negative in terms of psychological outcome (Lougheed & Hollenstein, 2012; Van Den Hauvel et al.,

2020; Zeman et al. 2006). More specifically, children using more ineffective emotion regulation strategies often show more rejection by peers (Kim & Cicchetti, 2010), depressive symptoms (Kovacs, Joormann, & Gotlib, 2008; Silk et al. 2003), anxiety symptoms (Carthy, Horesh, Apter et al. 2010; Hannesdottir & Ollendick 2007), behavioural problems (Zeman, Shipman, & Suveg, 2002) and greater engagement in risky behaviour, such as excessive alcohol use (Auerbach, Claro, Abela et al., 2010) and drug addiction (Vala, 2016).

In summary, anxiety and depressive symptoms are both associated with abnormalities in the processing and regulation of emotions. Findings consistently indicate that the emotion regulation strategies considered to be helpful show negative associations with depressive and anxiety symptoms, while those considered to be harmful show positive associations among youth (Aldao et al., 2010; Braet et al., 2014; Schäfer et al., 2017). Developmental models on psychopathology recognize cognitive vulnerabilities as one of the main contributors to emotional problems in children and adolescents (Braet, Van Vlierberghe, Bosmans et al. 2013). For instance, children and adolescents may be less capable of using cognitive strategies that require control over emotional reactions, such as problem-solving thinking (Eisenberg et al., 2010; Steinberg et al., 2006). In addition, they may make less effective use of certain strategies, since the awareness of how to use such strategies requires a greater degree of meta-cognition (Eisenberg et al., 2010).

2.4.3. Emotional Problems and Cognitive Control

In parallel with maturation of brain mechanisms, behaviour also becomes more controlled and voluntary during childhood and adolescence. The processes that allow for cognitive or voluntary control of behaviour, including response planning and preparation, response inhibition, and working memory, are driven by executive functions that support cognitive flexibility, abstract thought, and rule-guided behaviour (Luna, 2009). Executive

function is a term that has significant conceptual overlap with “cognitive control” but arguably refers to a more circumscribed set of processes responsible for the regulation and control of cognitive activity (Miyake, Friedman, Emerson et al., 2000). While cognitive control is an umbrella term for a collection of related yet distinct processes that support the ability of individuals to regulate, coordinate, and sequence thoughts and actions according to internally maintained behavioural goals (Braver, 2012; Miller & Cohen, 2001). These control processes help to guide attention and optimize behaviour in situations when conflicting action tendencies have to be modified based on contextual information.

Cognitive control is apparent during the early years of development and continues to develop and improve throughout childhood and adolescence (Diamond, 2002; Jurado & Roselli, 2007; Zelazo, Carlson, & Kesek, 2008). Evidence for early cognitive control can be seen during the first 6 months of life with the ability to hold representations in mind (Johnson, 2005; Pelphray & Reznick, 2002). From 7 to 12 months of age, the ability to coordinate the working memory and inhibitory control is evidenced, as commonly assessed with the A not B task (Diamond, 2006; Diamond & Goldman-Rakic, 1989; Garon, Bryson, & Smith, 2008).

The A-not-B paradigm is one of the few well-studied paradigms for research on the development of cognitive control in infancy and toddlers. In this paradigm, 8- to 12-month olds tend to search successfully for an object that is repeatedly hidden in location A and continue to search at this location despite having seen the object being hidden at a new location B (Diamond, 1985). Throughout childhood, continued improvements in cognitive control are reflected in performance that associates these processes with increased activity in the prefrontal cortex on neuropsychological tests (Davies & Rose, 1999; Levin, Culhane, Hartmann et al., 1991), event-related potential (ERP; Friedman, Nessler, Johnson et al., 2008), structural magnetic resonance imaging (MRI; Raz, Gunning-Dixon, Head et al., 1998),

and functional MRI (fMRI; van Veen & Carter, 2006). These results indicate that prefrontally supported executive functions are present early in development but have a protracted development through childhood as these processes become better defined.

Importantly, the phase of development from childhood through adolescence is characterized by refinement of existing processes and not the emergence of new ones. In fact, mature cognition occurs, whereby adolescents refine their abilities that include being able: (a) to hold information in mind, including complicated representational structures, to mentally manipulate that information, and to act on the basis of it; (b) to act on the basis of choice rather than impulse, exercising self-control (or self-regulation) by resisting inappropriate behaviours and responding appropriately; and (c) to quickly and flexibly adapt behaviour to changing situations (Davidson, Amso, Anderson et al., 2006). These abilities are referred to respectively as working memory, inhibition, and cognitive flexibility. Together they are three related but dissociable key components of both “cognitive control” and “executive functions” (Miyake et al., 2000).

Current research on internalising psychopathology has argued that difficulties in cognitive control are potential risk factors for the development of emotional problems such as anxiety and depression (Hirsch & Mathews 2012; Nelson, Kidwell, Nelson et al., 2018; Snyder, 2013; Snyder, Miyake, & Hankin, 2015a; Vuontela, Carlson, Troberg et al., 2013; Warren, Heller, & Miller, 2021). Well-documented adult research has evidenced executive dysfunction in individuals with internalising problems such as depression (e.g. Snyder, 2013). Likewise, though found less than the corresponding adult literature, studies indicated significant impairments in specific cognitive control abilities among children and adolescents with depression as compared to healthy controls (Gotlib & Joorman, 2010; Mathews & MacLeod, 2005; Rock, Roiser, Riedel et al., 2014; Wagner, Mueller, Helmreich et al., 2015). In particular, depressed youth have displayed relative deficits in working memory (Brooks,

Iverson, Sherman et al., 2010; Klimkeit, Tonge, Bradshaw et al., 2011), inhibition (Brooks et al. 2010; Maalouf, Brent, Clark et al. 2011), shifting between tasks or mental sets (Austin, Mitchell & Goodwin, 2001; Bredemeier, Warren, Berenbaum et al., 2016; Günther, Konrad, De Brito et al., 2011; Micco, Henin, Biederman et al. 2009), and sustained attention (Cataldo, Nobile, Lorusso et al., 2005; Günther et al. 2011; Han, Klimes-Dougan, Jepsen et al. 2012). Cognitive models of depression (e.g. Beck, Brown, Steer et al., 1987; Ellis & Grieger, 1986; Mathews & MacLeod, 2005) posit that deficits in controlling information in working memory and biases in attention and interpretation maintain depressive symptoms. Specifically, difficulties inhibiting and updating negative information in working memory are thought to contribute to cognitive biases and maladaptive emotion regulation strategies (e.g., excessive rumination) (LeMoult & Gotlib, 2019).

Cognitive models of anxiety have also converged on cognitive control as a potential mechanism of psychopathology (Joormann et al., 2009; Hirsch & Mathews, 2012). For instance, the Attentional Control Theory (Eysenck & Derakshan, 2011) and the Processing Efficiency Theory (Eysenck & Calvo, 1992) postulate that compromised cognitive control is linked to excessive and uncontrollable worry, a core symptom of anxiety. Indeed, research has found an association between a range of cognitive control impairments and anxiety disorders (Fujii, Renno, McLeod et al., 2013; Hallion, Tolin, Assaf et al., 2017; Kertz, Belden, Tillman et al. 2016; Muris & Ollendick, 2005; Toren, Sadeh, Wolmer et al., 2000). The few studies examining longitudinal associations have found cognitive control to be related to anxiety problems in an adolescent population two years later (Han, Helm, Iucha et al., 2016) and in adults nine years later (Zainal & Newman, 2018). Research on specific anxiety-related executive function impairment has evidenced deficits in working memory capacity (Eysenck, Payne, & Derakshan, 2005; Hayes, Hirsch, & Mathews, 2008; Moran,

2016; Snyder, Kaiser, Warren et al., 2015b), and attention (Airaksinen, Larsson, & Forsell, 2005; Ehrenreich & Gross, 2002; Taghavi, Dalgleish, Neshat-Doost et al., 2003).

2.4.4. Emotional Problems and Attention Bias

Attention bias refers to the phenomenon of hyperattention to threatening material (Muris & Marckelbach, 1998) and attention bias towards threat implies the preferential tendency to allocate attention to threat-related information rather than nonthreat-related information. Cognitive theories of anxiety hold that biases in processing and allocating attention to threat are critically involved in the aetiology and maintenance of anxiety (Beck & Clark, 1997; Hofmann, Ellard, & Siegle, 2012; Mogg & Bradley, 1998). For instance, Beck suggested that dysfunctional cognitive schemata disproportionately facilitate the processing of threat-related information among individuals with anxiety (Beck & Clark, 1997; Beck et al., 1985). Adding to Beck's schema theory, Ingram and Kendall (1987) proposed that experiences of distortions in thoughts lead youth with anxiety to perceive situations as threatening or dangerous.

Building upon the Ingram and Kendall (1987) distinction, Daleiden and Vasey (1997) added that this experience of thought distortions occurs across different stages of cognition in childhood and adolescence. Specifically, they formulated that anxious children and adolescents selectively attend to threat-related information, interpret ambiguous situations as threatening and make threat-related attributions accordingly. Moreover, because they expect negative outcomes, they tend to select behavioural options that prioritize personal safety as opposed to goal achievement or success. The interaction of these cognitive processes leads anxious youth to thus overemphasize threat in various situations and make decisions based on this perceived threat (Daleiden & Vasey, 1997). Supporting these theories, previous research indicated that anxious children tend to view ambiguous situations as more threatening than do

non-anxious children (Barrett, Rapee & Dadds et al., 1996; Bell-Dolan, 1995; Chorpita, Albano, & Barlow, 1996) and this cognitive bias towards threat-related stimuli has extended largely across children and adolescents with high anxiety (Bar-Haim, Lamy, Pergamin et al., 2007; Dodd, Stuijzand, Morris et al., 2015; Lau, Hilbert, Goodman et al., 2012; Stuijzand, Chakrabarti, Reynolds et al., 2019). A recent meta-analysis found a robust association between interpretation bias (increased likelihood of interpreting ambiguity as threatening) and anxiety in children and adolescents (Stuijzand, Creswell, Field et al., 2017).

Attentional biases towards threatening information has been evidenced as an important vulnerability factor that not only leads to the development of anxiety disorders (Bar-Haim et al., 2007; Eysenck, Derakshan, Santos et al., 2007), but also contributes to the maintenance of anxiety disorders (Mogg & Bradley, 1998; Williams, Watts, McLeod et al., 1997). The relationship between anxiety and attentional biases towards threat has been well documented in the meta-analyses among both adult (Bar-Haim et al., 2007) and children population (Dudeny, Sharpe & Hunt, 2015). There is substantial evidence that adults with anxiety display a bias towards threat-related information, as compared to adults without anxiety. Similar to the attention bias observed in anxious adults, children and adolescents with anxiety also display greater attention bias to threat-related information than control groups. However, inconsistencies across studies have been reported. For instance, the nature of this bias among children and adolescents was not clear. Attention bias seemed to be moderated by age, such that the attentional bias difference between anxious and control children seemed to increase with age (Dudeny et al., 2015). Moreover, research also indicated that there is no association between attention bias and anxiety (Britton et al., 2013), while others have found that attention bias away from threat is linked to anxiety (Salum et al., 2013; Waters, Bradley & Mogg, 2014). A recent meta-analysis suggests that anxiety is not necessarily characterised by attention bias towards threat (Kruijt, Parsons & Fox, 2018). New

evidence indicates that attention bias to threat may be normative in young children and that the association between cognitive bias and anxiety emerges with development (Dodd, Rayson, Ryan et al., 2020; Stuijzand, Stuijzand, Reynolds et al., 2020).

Further, attentional bias in youth with anxiety has been measured with a range of paradigms (e.g., stroop, visual dot-probe, visual search, emotional cueing, masked faces, eye tracking, eye blink), using different types of stimuli (e.g., linguistic and/or pictorial), and stimulus presentation times. The pattern of findings across studies using these paradigms is mixed. Some studies have shown children and adolescents with anxiety have a vigilance to threat (Abend, de Voogd, Salemink et al., 2018; Eldar, Apter, Lotan et al., 2012; Waters, Henry, Mogg et al., 2010), whereas others have shown the opposite pattern of results with avoidance of threat information (Monk, Nelson, McClure et al., 2006) or no difference in attentional bias between youth with or without anxiety (Benoit, McNally, Rapee et al., 2007; Britton, Bar-Haim, Carver et al., 2012; Hadwin, Donnelly, Richards et al., 2009). A recent meta-analysis of eye-tracking data among youth indicated that anxious youths were more avoidant of threat across the time course of stimulus viewing, hence suggesting that attention in anxiety has a biphasic time course with initial vigilance, followed by later avoidance (Lisk, Vaswani, Linetzky et al., 2020). Given the mixed findings, researchers have concluded that the mechanisms underlying attentional bias in the youth population may not be as clear-cut as they are in adult population with anxiety (Cisler & Koster, 2010; Field, Hadwin, & Lester, 2011).

Studies found that adolescents from high-income countries with relatively high levels of self-reported anxiety and depression displayed stronger biases in attention than adolescents with lower levels of self-reported anxiety and depression (Klein, de Voogd, Wiers et al., 2018; Nightingale, Field, & Kindt, 2010; Platt, Waters, Schulte-Koerne et al., 2016).

However, studies on cognitive biases in children and adolescents rarely combine anxiety and

depression, despite the evidence of high comorbidity, the strong overlap in the genetic vulnerability, and the potential interaction between the associated biases of the two internalising disorders (Luebbe, Bell, Allwood et al., 2010; Nivard, Dolan, Kendler et al., 2015; Rice & Thapar, 2009). Studying anxiety and depression simultaneously gives more insight into the different possible etiological pathways underlying their frequent comorbidity (Cummings et al., 2014). Moreover, an integrated understanding of how cognitive biases may collectively influence the aetiology and maintenance of anxiety and depression has important implications for the identification, prevention and treatment of anxiety and depression in children and adolescents (Everaert, Koster, & Derakshan, 2012; Hirsch, Mathews, Clark et al., 2006; Muris & Field, 2008).

2.4.5. Emotional Problems and Inhibition Control

Inhibition refers to mental processes responsible for intentional and voluntary control or the ability to prevent interference of non-pertinent information by suppressing previously relevant information which is not currently useful (Carlson & Wang, 2007). The development of inhibitory control is regarded as essential for the development of self-regulation, the development of more complex executive function skills and the overall maintenance of mental health (Diamond, 2013; Friedman & Miyake, 2017). Impairments in inhibition control skills have been associated with a broad range of psychiatric symptoms in both general and clinical populations from high-income countries across childhood, adolescence, and adulthood (Schoemaker, Mulder, Deković et al., 2013; White, Degnan, Henderson et al., 2017; Wright, Lipszyc, Dupuis et al., 2014). Moreover, deficits in inhibition control have been proposed to be an underlying risk factor for internalising disorders such as anxiety and depression (Kertz, Belden, Tillman et al., 2016; Riggs, Blair, & Greenberg, 2004; van Deurzen, Buitelaar, Brunnekreef et al., 2012). Specifically, these deficits have been found to

increase the risk of anxiety and depression by enhancing negative biases in attention and memory, and by making it more difficult to control negative thoughts (Disner, Beevers, Haigh et al., 2011; Kertz et al., 2016; Nolen-Hoeksema, 2000).

Given that much of the evidence suggests that anxiety predisposes the development of depression, it is plausible that anxiety may play a role in mediating the relationship between inhibition and depression (Gladstone & Parker, 2006). Indeed, evidence argues that the presence of social anxiety may provide the mediational link between early inhibition and later depression (Muris et al., 1999; Muris, Merckelbach, Schmidt et al., 2001). Interestingly, in the presence of environmental stress, behavioural inhibition becomes a vulnerability for psychopathology (Craske, 1997; Ollendick & Hirshfeld-Becker, 2002). For example, a child who is highly inhibited, if exposed to stressful peer experiences, may be more likely to develop social avoidance, together with fears and concerns about being judged or rejected. On the other hand, harmful parenting behaviours may instigate an inhibited response from a child, placing strain upon the relationships with parents or peers, potentially resulting in isolation, fear and rejection. In the same line, deficits in inhibitory control have been found to be associated with poor social competence (Rhoades, Greenberg, & Domitrovich, 2009) which, in turn, creates a risk for later internalizing symptoms (Bornstein, Hahn, & Haynes, 2010). Youth with good inhibitory control skills report better outcomes in stressful environments than youth with inhibitory control deficits, suggesting that deficits in inhibitory control may not be a causal but rather a contributory risk factor for internalizing problems of anxiety and depression (Davidovich, Collishaw, Thapar et al., 2016; Liu, Calkins, & Bell, 2018).

Depression has consistently been associated with disturbances in inhibitory control (Langenecker, Bieliauskas, & Rapport, 2005, Langenecker, Kennedy, & Guidotti, 2007; Wagner, Sinsel, & Sobanski, 2006). In particular, early inhibition has been found to be a risk

factor for subsequent depression (Caspi, Moffitt, Newman et al., 1996; Essau et al., 2014; Gladstone & Parker, 2006; Rosenbaum, Biederman, Hirshfeld-Becker et al., 2000).

Depression is a heterogeneous disorder which may affect inhibitory control processes differently (Gold & Chrousos, 2002; Parker 2000, 2007). Depressed individuals have displayed difficulty in disengaged attention and attention control due to impairments in response inhibition mechanisms (Fox, Hane, & Pine, 2007; Fox, Henderson, Perez-Edgar et al., 2008; Jorman, 2004; Joorman & Gotlib, 2008;). For example, behaviourally inhibited children and adolescents show greater interference effects in Stroop-like emotion processing tasks (Perez-Edgar & Fox, 2007; Schwartz, Snidman, & Kagan, 1996) and greater difficulty controlling selective attention when under stress (Perez-Edgar & Fox, 2005). Neural research argues that the link between inhibition deficits and depression seems to reflect a more comprehensive impairment of the dopaminergic prefrontocortical-striatal pathways (van Deurzen et al., 2012). Impairment in these pathways is also associated with reward sensitivity, which has been suggested to contribute to a higher risk of depression (Luking, Pagliaccio, Luby et al., 2016; van Deurzen et al., 2012).

2.5. Emotion regulation, Inhibition Control and Emotional Problems

Emotions and cognitive control processes are intertwined (Zalazo, Qu, & Kesek, 2010) whereby both work together to process information and execute action (Bell & Wolfe, 2004; Cacioppo & Berntson, 1999). The bidirectional influences are such that emotions help organize one's thinking, learning and action (emotion as regulating), and cognitive processes play a role in regulating emotions (emotions as regulated) (Carlson & Wang, 2007; Garcia-Andrés, Huertas-Martinez, Ardura et al., 2010). Biases and deficits in cognitive functioning are posited to affect people's ability to regulate emotion and mood states (Gotlib & Joormann, 2010). They may cause impairments in the regulation of emotions (Joormann &

Tanovic, 2015; Strauss, Kappenman, Culbreth et al., 2013) and potentially increase the vulnerability to develop emotional problems such as anxiety and depression (Joormann et al., 2009).

Research has found attention bias in emotion regulation among individuals with both depression and anxiety as co-occurring symptoms (Joormann & Gotlib, 2007; Sass, Heller, Fisher et al., 2014; De Raedt & Koster, 2010). Dysfunctional attentional biases to emotional information have been linked to emotion dysregulation, anxiety and depression (Kim, Kim, & Kim, 2016). For example, anxious individuals have shown biased attention to threat-related information, and depressed individuals have also shown attentional biases to dysphoric-related information (Cox, Hogan, Kristian et al., 2002). Attentional biases to task-irrelevant emotional information may play a critical role in the development and maintenance of emotional problems (Pergamin-Hight, Naim, Bakermans-Kranenburg et al., 2015). Heightened anxiety and stress reactivity were observed in healthy individuals when an attentional bias to threat-related information was experimentally induced (Mathews & MacLeod, 2002; Eldar, Ricon, & Bar-Haim, 2008). In contrast, training attentional avoidance of negative information has led to reduced state anxiety (Amir, Weber, Beard et al., 2008) and reduced emotional reactivity to stressors (Dandeneau & Baldwin, 2009).

Biased attention can modify mood and cognition in depression, retaining the depressive symptoms over time (Beshai, Prentice, Dobson et al., 2014). Depressed individuals have difficulties switching and disengaging their attention from negative-related information to positive, as well as updating their affective response effect (Villalobos, Pacios & Vazquez, 2021). Given such difficulties in disengaging from negative stimuli, it is argued that the controlling abilities of attentional deployment, as a regulatory strategy, might be impaired (Gotlib & Joormann, 2010). A possible explanation for this bias may be that self-relevant emotional stimuli may attract disproportionately more resources through attentional

control difficulties, thus causing an attentional bias through the activation of maladaptive emotion schemas (Mogg, Mathews, & Weinman, 1989; Williams, Mathews, & MacLeod, 1996). Additionally, attention bias in depression may obstruct adaptive regulation of emotions by ensuring an increased presence and elongated processing of negative material, thus leading to a more persistent negative affect (Joormann & D'avanzato, 2010; Sanchez, Vazquez, Marker et al., 2013).

Inhibitory control is another key mechanism for successful emotion regulation as people are required to inhibit prepotent emotional responses in service of more desirable and appropriate ones (Spinhoven, van der Veen, Voshaar et al., 2017). Moreover, research from high-income countries shows that anxiety disorders result in cognitive control deficits arising from disturbances in goal maintenance due to disruption of the ability to inhibit task irrelevant information (Beaudreau, MacKay-Brandt, & Reynolds, 2013). Hence, reduced cognitive functioning in attention and inhibition control suggests that anxiety poses an enhanced risk for impaired cognitive control of emotion. Moreover, there is emerging evidence that depression is characterized by difficulties in the inhibition of mood-congruent material that could result in prolonged processing of negative, goal-irrelevant aspects of presented information and thereby hinder recovery from negative mood, leading to the sustained negative affect that characterizes depressive episodes (Nolen-Hoeksema et al., 2008). Therefore, deficits in cognitive inhibition control lie at the heart of biases in attention in depression and set the stage for ruminative responses to negative events and negative mood states (Wagner, Alloy, & Abramson, 2015).

Recent evidence suggests the notion that affective cognitive control (updating, inhibition, and shifting) is the cognitive building block of successful emotion regulation (Schweizer, Gotlib & Blakemore, 2020). Deficits in affective cognitive control have been associated with mental health problems including depression and anxiety in both adults

(Schweizer, Satpute, Atzil et al., 2019) and adolescents based mostly in high-income countries (Kilford, Foulkes, Potter et al., 2015; Schweizer, Parker, Leung et al., 2020). Young adolescents with higher levels of mental health problems showed poorer cognitive control and higher levels of emotion regulation difficulties. Promising studies indicate that cognitive control can be improved through training and the improved cognitive control is linked to improved emotion regulation and mental health outcomes (Schweizer, Grahn, Hampshire et al., 2013; Schweizer, Samimi, Hasani et al., 2017). These findings provide important directions for the prevention and intervention of emotional problems in children and adolescents while targeting deficits in emotion regulation and cognitive control.

2.6. Summary

The literature suggests that comorbidity within emotional problems such as anxiety and depression are a common representation in children and adolescents (Melton, Croarkin, & Strawn, 2016). The comorbidity rates between anxiety and depression seem to be high in child and adolescent populations. It has been argued that anxiety and depression are partly based on similar underlying cognitive mechanisms (Klein et al., 2018). Indeed, there are transdiagnostic cognitive processes that cut across the underlying symptoms of anxiety and depression and that ultimately predefine their development and/or course (Iverach, Menzies, & Menzies, 2014; Sloan & Kring, 2010). Recent research on internalising psychopathology has shifted away from analysing components of each disorder (i.e. anxiety and depression) to focusing on investigating the common underlying dimensions of cognitive functioning of emotions (Caspi et al., 2014; Hong & Cheung, 2014). For instance, accumulating evidence (Aspen, Darcy, & Lock, 2013; Fraire & Ollendick, 2013) suggests that cognitive biases are transdiagnostic processes occurring in both anxiety and depression that increase the risk of internalised psychopathology in general.

Of growing concern is that most of the literature on emotional problems, such as anxiety and depression and their associated risk factors, emerge from high-income countries (HICs), with very limited evidence emanating from low- and middle-income countries (LMICs). There is a lack of prevalence data on depressive and anxiety symptoms in the child and adolescent population in LMICs. Importantly, those who do not meet full diagnostic criteria for either depressive or anxiety disorder but do display the symptoms, may be overlooked and consequently not receive adequate treatment, and this quadruples the risk for the development of anxious and/or depressive difficulties (Klein, Shankman, & Lewinsohn, 2009; Oldehinkel, Wittchen, & Schuster, 1999; Melton et al., 2016). An urgent need is felt for research into the range, severity, and context of emotional problems among children and adolescents for the subsequent design of effective interventions in the prevention or treatment of emotional problems, especially in LMICs. The next chapter will focus on a systematic review analysis with the aim to estimate the prevalence of emotional problems among children and adolescents living in LMICs.

Chapter 3: Study 1:

Prevalence of emotional problems among children and adolescents in low- and middle-income countries: A systematic review

3. Overview

This chapter will review the research literature examining the prevalence of emotional problems among the child and adolescent population living in LMICs. In doing so, the review aims to offer indications as to the types of emotional problems being experienced by these children and adolescents. Such a review is essential for acquiring accurate prevalence rates that could inform research and intervention priorities in the youth population. Moreover, it will also help determine the appropriateness of intended investigative methods in subsequent chapters.

3.1. Emotional Problems in LMICs

Emotional problems among young people account for approximately 16% of the global burden of disease, with anxiety and depression as leading causes of disability worldwide (Akena et al., 2012; Murray et al., 2012; WHO, 2018). There is now accumulating evidence that there may be a real secular increase in youngsters' symptom prevalence of emotion problems worldwide (Bor, Dean, Najman et al., 2014; Twenge, Gentile, Dewall et al., 2010; Xin, Niu & Chi, 2012). Emotional problems such as anxiety and depression are the most common mental health problems in childhood and adolescence (Costello et al., 2003), affecting 15-32% of the young population (Essau et al., 2000; Kessler et al., 2001; Merikangas, He, Burstein et al., 2010; Polanczyk, Salum, Sugaya et al., 2015). In the

European region, depression and anxiety disorders fall into the top 5 causes of overall disease burden among children and adolescents (as measured by disability-adjusted life years). Importantly, suicide, which is often associated with anxiety and depression, is the leading cause of death among 10–19 youth population in low- and middle-income countries (LMICs) and the second-leading cause in high-income countries of the European region (WHO, 2018). Moreover, by 2030, depression alone is likely to be the third leading cause of disease burden in low-income countries and the second highest cause of disease burden in middle-income countries (Mathers & Loncar, 2006). Findings from review studies of high-income countries show a point prevalence of up to 18% for mental illness in children and adolescents (Deighton, Lereya, Casey et al., 2019; Lawrence, Johnson, Hafekost et al., 2015; Phillips & Yu, 2021). While the prevalence estimates for youth in LMICs are up to 27% for anxiety symptoms and up to 28% for depressive symptoms, for posttraumatic stress disorder (PTSD), the estimate can be as high as 87% in adolescents who have experienced traumatic events (Cristobal-Narvaez, Haro, & Koyanagi et al., 2020; Vancampfort, Stubbs, Firth et al., 2018; Yatham, Sivathasan, da Silva et al., 2010).

When comparing the prevalence rates of children and adolescents in high-income countries to those in low- and middle-income countries, often a large variability has been found which has largely been attributed to methodological limitations concerning the nature of the youth population tested and the diagnostic limitations. For example, the majority of reviews previously conducted have focused on children and adolescents experiencing adverse events such as war conflict or humanitarian crisis (Jordans, Pigott, & Tol, 2016; Morina, Malek, Nickerson et al., 2017; Purgato, Gross, Betancourt et al., 2018; Yatham, Sivathasan, Yoon et al., 2018). However, these reviews did not consider the general population of children and adolescents in low- and middle-income countries. Moreover, some reviews focus on clinical youth population (Steel, Marnane, Iranpour et al., 2014) who fit into clinical

diagnostic categories, despite the presence of many more children and adolescents who still have impaired levels of psychological distress but who remain undiagnosed (Costello et al., 2005b). For example, many children and adolescents in LMICs struggle with emotional problems but they do not form a discrete group. Furthermore, misdiagnosis may occur. Some of the reasons for misdiagnosis might relate to the use of unreliable and invalid assessment tools, masking symptoms, and the presence of comorbid disorders. Misdiagnosis and under-detection of symptoms often lead to young people not being given appropriate, or even any, intervention. This often leads to worsening of emotional problems. Hence, the frequency of emotional problems such as anxiety and depression among the young population in LMICs raises questions about the real nature and extent of emotional problems experienced by children and adolescents in LMICs.

Importantly, as discussed in Chapter 2, while the onset of anxiety and depression seems to peak during late adolescence and early adulthood, females have been reported as being at significantly greater risk than males (Essau et al., 2000; Lewinsohn et al., 1998; Kessler, Berglund, Demler et al., 2005). Women have twice the lifetime rates of depression and most anxiety disorders (Albert, 2015; McLean, Asnaani, Litz et al., 2011). Interestingly, the frequency of anxiety and depression symptoms seems to increase with age, with significant gender differences emerging around puberty where girls report a significant increase in depression and anxiety compared to boys (Cohen et al., 1993; Essau et al., 2000; Petersen et al., 1991). This gender difference remains throughout adulthood (Weissman et al., 1996). Several other risk factors related to the emotional problems of children and adolescents have been identified, including low socioeconomic level, family dysfunction, physical or psychological abuse, traumatic experiences (e.g. accidents, natural disasters, wars), and insufficient stimulation. Conversely, sensitive upbringing with responsible parenting, including stimulation for the autonomous development of children and educational

opportunities for development, has been shown to be a protective factor against emotional problems (Moffit, Caspi, Harrington et al., 2002). As such, early diagnosis and intervention for emotional problems among young people is vital.

Brief screening tools are essential for mental health care in LMICs. LMICs face challenges related to stigma and labelling of emotional disorders, and low human resources and service facilities (Zhou et al., 2020). Mental health professionals have time and training constraints to administer complex diagnostic interviews to all individuals at risk of mental illness. Adopting appropriate screening instruments can also enhance research and training in detecting emotional problems in LMICs. By providing a succinct overview of symptoms of emotional problems, the screening instruments teach mental health workers what to look for and thus improve their ability to detect emotional problems. Evidence suggests that screening tools are more likely to perform well in a given setting, and it should be enhanced by local validation wherever possible (Ali, Ryan, & Silva, 2016).

Based on a dimensional approach to classification, the Strength and Difficulties Questionnaire (SDQ) (Goodman, 1997) is one of the most frequently used screening instruments for emotional problems and behavioural problems in children and adolescents (Kersten, Czuba, McPherson et al., 2016; Schwab, Gebhardt, Hessels et al., 2016). The SDQ, a brief mental health screening tool, has been translated into many languages for use across mental health settings in both HICs and LMICs such as the UK, America, China, Canada, Africa, India, Turkey, Bulgaria and Croatia (de Vries, Davids, Mathews et al., 2017; Goodman, Ford, Corbin et al., 2004; Goodman & Goodman, 2012; Jee, Halterman, Szilagyi et al, 2011; Stevanovic, Urban, Atilola et al., 2014). The SDQ assesses five domains covering emotional symptoms, conduct problems, hyperactivity, peer relationship problems and prosocial behaviour (Goodman, 1997). The SDQ has been applied to both population-based samples and clinical samples. The use of the SDQ has led to an accumulation of steadily

growing empirical evidence for the applicability of the SDQ in identifying at-risk children and adolescents and improving the treatment of emotional difficulties.

3.2. Research Aims

There is an urgent need for early detection in order to inform effective prevention strategies for emotional problems in LMICs. However, research into the early detection of youth emotional problems in LMICs receives insufficient attention in the academic circle, with only 3-5% of published mental health research addressing the young population in LMICs (Barry, Clarke, Jenkins et al., 2013; Saxena et al., 2007; Zhou, Ouyang, Nergui et al., 2020). A recent systematic review by Zhou et al. (2020) highlighted that there is a universal lack of youth mental health policies in LMICs, which impacts on various challenges in LMICs. One of the major challenges that remains relates to a lack of data and evidence on child and adolescent mental health, from service statistics to programme evaluation. To better solve challenges for LMICs, more research based on local experience and expertise is in extreme need.

Accurate prevalence estimates in LMICs are essential to inform service planning, resource allocation, training, and research priorities (Costello et al., 1993). Moreover, the identification of prevalence estimates can contribute to addressing questions about aetiology and inform the design of future studies in LMICs (Polanczyk et al., 2015). At the time of thesis commencement, a lack of research in LMICs was found that provided reliable prevalence estimates of youth emotional problems which is important to determine the need for intervention. Thus, the objective of this systematic review is to review published studies on emotional problems among children and adolescents living in LMICs and to provide an updated analysis of the prevalence of emotional problems among this young population in LMICs. The aims of the review will address the following questions:

- i) What types of emotional problems are examined in LMICs?
- ii) What methods are used to assess the prevalence of emotional problems among children and adolescents in LMICs?
- iii) What is the prevalence of emotional problems among children and adolescents in LMICs?
- iv) Are there any gender differences in the prevalence rate of emotional problems among the youth population in LMICs?

3.3. Method

3.3.1. Protocol and Registration

This review was developed in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Moher, Liberati, Tetzlaff et al., 2009), and it has therefore been reported following the PRISMA guidelines. The protocol for this review was registered in the International Prospective Register of Systematic Reviews (PROSPERO) database prior to data extraction, with the study protocol registration CRD42018109406 (see Appendix 2). Operationalization of key constructs, methods of searching, eligibility criteria and analysis were therefore specified in advance and documented online.

3.3.2. Operationalization of Key Construct

3.3.2.1. *Childhood and Adolescence*

The World Health Organisation (WHO) describes any persons below the age of 10 as children. There has been considerable controversy about the validity of mental diagnosis in very young children aged 2 to 5. However, there is now accumulating evidence of emotional difficulties such as anxiety and depression being prevalent in preschool children (Bitsko, Holbrook, Robinson et al., 2016; Cree, Bitsko, Robinson et al., 2018; Egger & Angold, 2006; von Klitzing, Dohnert, & Kroll et al., 2015). As noted in Chapter 2, the WHO describes any persons aged 10–19 as adolescents. They also recognise any individuals up to age 24 as a comprehensive category of youth (WHO, 2011). This category can be considered as adolescence given that the age group of youth changes with circumstances, such as considerable changes in demographic, financial, economic, and socio-cultural settings (United Nations, 2010). Kinghorn, Shanaube, Toska et al. (2018) proposed that adolescence be categorised into three age groups and descriptors—young adolescence (10–14 years), middle adolescence (15–19 years) and late adolescence (20–24 years), rather than just a single broad age band. For the purpose of this review, the WHO categorization of childhood and adolescence as 0–19 years of age has been followed. However, as also suggested by WHO, research describing adolescents up to age 20 will also be considered.

3.3.2.2. *Emotional Problems*

Definitions of emotional problems were discussed in chapter 2, however, for the purpose of this review, emotional problems refer to symptoms of anxiety and depression, such as sadness, loneliness, worrying, feelings of worthlessness and anxiousness. Both anxiety and depression are serious conditions, impacting both the physical and mental health of an individual. Symptoms of anxiety and depression can range from mild to severe and may include (but are not limited to) several of the following: loss of energy, change in appetite,

anxiety, restlessness, feelings of worthlessness, guilt, hopelessness, indecisiveness, sleeping more or less than usual, or thoughts of self-harm or suicide. Both anxiety and depression are globally experienced on a continuum (Patel, 2017; WHO, 2017) and for the purposes of this review, these emotional problems will be defined by clinical diagnoses, structured clinical interviews, self-report rating scales or behavioural measures. Specifically, diagnosis of anxiety or depression was not a basis for inclusion or exclusion. Instead, studies were considered eligible if they included standardized outcome measures or subscales from a composite measure to assess symptoms of anxiety and/or depression.

3.3.2.3. *Low and Middle-income Countries*

Studies were included in this review if conducted in a country that met the World Bank 2019 classification based on gross national income and gross domestic product and also based on the most updated release. The systematic search was conducted in August 2019 (World Bank, 2019), so the definition of low- and middle-income countries is based on the World Bank classification as low-, lower-middle- or upper-middle-income during the period between the year 2000 and 2019. This allowed for changes in countries' income status over time (World Bank, 2019).

3.3.3. Eligibility Criteria

3.3.3.1. *Types of Participants and Settings*

Studies involving children and adolescents aged between 0 to 19 years of age living in LMICs being assessed for emotional problems, mental health problems and/or issues related to anxiety and/or depression symptoms, have been included. The age range of participants was expected to vary between studies, hence any age ranges applicable for youths/minors of

the country of study was taken into consideration. LMICs were categorised as having low-income, lower-middle-income, or upper-middle-income by the World Bank organisation (<https://www.worldbank.org>) as at August 2019. Studies that had participants recruited from community settings, educational contexts or birth cohorts were also included.

3.3.3.2. *Types of Assessment and Outcomes*

Studies assessing emotional problems, mental health problems, internalising problems, mental health disorders, anxiety and depression symptoms among children and adolescents living in LMICs, have been included. Studies in which participants were assessed using diagnostic interviews or validated questionnaire measures which provide cut-off scores based on either DSM or ICD symptoms criteria, or validated measures of clinical level of anxiety and/or depressive related symptoms, were reviewed. Some of the studies that had multiple targeted research outcomes were also included provided that they had one outcome defined as measuring the prevalence of emotional/mental health problems (i.e. anxiety and depression related symptoms) among children and/or adolescents.

3.3.3.3. *Study Type*

Studies involving quantitative methodologies such as observational, cohort and intervention methods reporting epidemiological/prevalence data on measures of emotional problems, anxiety and depression, among children and adolescents in one or more LMIC were eligible for review.

3.3.4. *Exclusion criteria*

Studies assessing emotional problems of children and adolescents from HICs were excluded. Studies conducted on clinical samples (e.g. inpatients in hospitals), special samples

(e.g. those who experienced special events such as earthquake) or in special settings (e.g. those who lived in an orphanage or dormitory) were also excluded from the review. Moreover, studies focusing specifically on intellectual disabilities or specific medical conditions (such as HIV/AIDS and terminal illnesses) were also excluded. Nevertheless, these samples of children/adolescents may have been included in numerous population-based studies. These samples warranted separate research and that inclusion of these samples could potentially bias results by an over- or under-estimation of true prevalence and thus lead to an incorrect estimation of mental health problems. Separate reviews with these samples are warranted. Moreover, studies that did not provide separate data for children and adolescents (0–19 years) from older participants were excluded. Single case or case series methodologies or studies reporting only qualitative information were excluded. Articles that were not peer-reviewed or reported in the English language were also excluded. If there was more than one paper reporting data from the same study (same sample), only the one reporting the findings most closely related to the study criteria was included.

3.3.5. Information Sources and Search Strategy

An online search was carried out in PsycINFO (EBSCO) and MEDLINE (PubMed) databases for articles published from 1st January 2000 to 31st August 2019. A comprehensive search using both keywords (also free text searching) and subject-headings (also controlled vocabulary searching) included: (a) ‘child’ / ‘adolescent’ terms (e.g. child, adolescent, youth, minors); (b) ‘emotional problems’ / ‘mental health problems’ terms (e.g. anxiety, depression, internalizing); (c) ‘low- and middle-income country’ / ‘developing country’ terms (e.g. [underdeveloped, third world, underserved] country, population, nation); and (d) ‘study design’ terms (e.g. epidemiological, cross-sectional, cohort). The master search strategies used for searching PsycINFO and MEDLINE are provided in (Appendix 3), respectively.

Reference lists of all included articles were then scanned to identify any relevant articles that may have been missed in the online search.

3.3.6. Study Selection

Eligibility assessment (title/abstract screening and full-text assessment) of all identified articles was performed by the researcher and an independent reviewer supported the review process. Abstracts that were clearly irrelevant for the current study were discarded, while the remaining full-texts were reviewed for their applicability to the inclusion and exclusion criteria. Where the researcher was unsure whether a paper met the eligibility criteria, the independent reviewer was consulted. The independent reviewer further assessed the full list of 43 final included articles to ensure that they met the inclusion/exclusion criteria. Disagreements, if present, were resolved by consensus.

3.3.7. Data Extraction

All articles selected based on the inclusion criteria were scrutinised to extract the following information: study characteristics (author, publication date, country, sample size); sample recruitment (e.g. community, cohort, school); participant characteristics (age group, percentage of boys and girls, if data were available); assessment characteristics (diagnostic measures, standardised questionnaires) and prevalence rate of all types of anxiety and depression disorders (percentage of girls, boys or both).

3.3.8. Quality Assessment

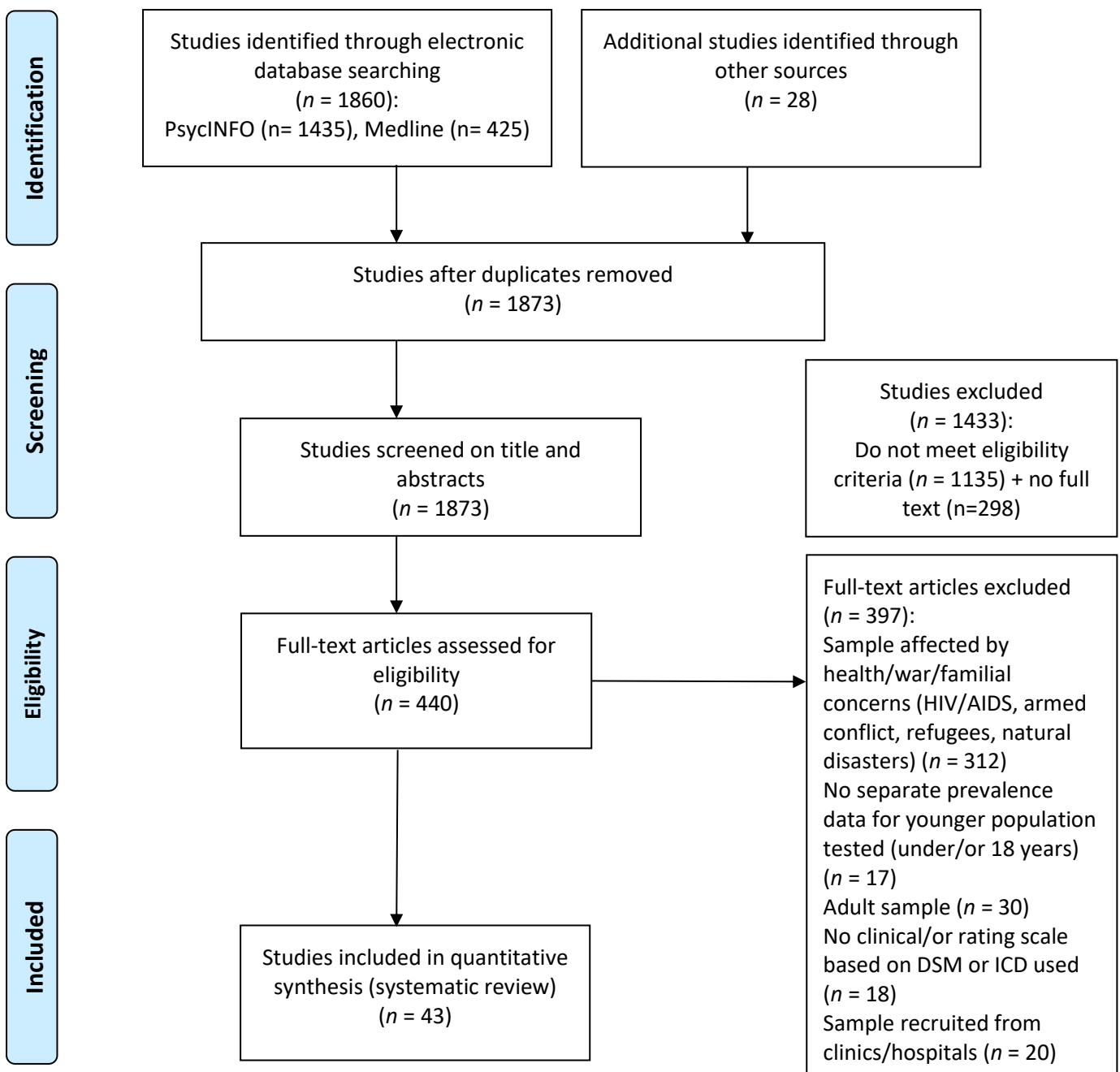
The methodological quality of the included studies was assessed through the STROBE combined checklist for cohort, case-control, and cross-sectional studies in epidemiology (Von Elm et al., 2007). This validated checklist includes 22 items that assess

the title, abstract, introduction, methods, results, discussion and other information. The relative quality of each article is compared (maximum score of 22), with a higher score indicating better quality. The large heterogeneity between populations and methods did not allow for a meaningful meta-analysis of results. Therefore, what is presented below is a qualitative synthesis of prevalence data.

3.4.Results

3.4.1. Study Selection

A total of 1873 abstracts were identified through the searches of PsycINFO and MEDLINE ($n = 1860$), and other sources such as reference lists and forum posts ($n = 28$). Following removal of duplicates ($n = 15$) and abstract screening ($n = 1433$ excluded), 440 studies were retained for full-text screening, which resulted in 43 studies meeting the eligibility and inclusion criteria. Based on PRISMA guidelines (Moher et al., 2009), a flow chart outlining study selection is presented in Figure 1.



**Figure 1: Flow diagram of study selection for systematic review
(based on PRISMA; Moher et al., 2009)**

3.4.2. Study Characteristics

Table 2. Characteristics of studies which met the inclusion criteria of the review

Authors, Year	Country	Design	Total (N)	Age range (years)	Gender		Instrument/s	Prevalence Rate (%)		
					Male (%)	Female (%)		Male (%)	Female (%)	Both (%)
<i>Anxiety Symptoms (4 studies)</i>										
1. Abbo et al. (2013)	Uganda	CS Multistage sampling of children in 4 rural districts	1587	3 – 19	46.3	53.7	MINI International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) DSM-IV oriented	Any anxiety disorder: 23.1% Generalized anxiety disorder: 0.54% Posttraumatic stress disorder: 6.3% Obsessive compulsive disorder: 0.41% Separation anxiety disorder: 5.4%	Any anxiety disorder: 29.7% Generalized anxiety disorder: 2.1% Posttraumatic stress disorder: 6.9% Obsessive compulsive disorder: 0.70% Separation anxiety disorder: 6.1%	Any anxiety disorder: 26.6% Generalized anxiety disorder: 1.4% Posttraumatic stress disorder: 6.6% Obsessive compulsive disorder: 0.57% Separation anxiety disorder: 5.8%

									Social phobia (social anxiety disorder): 4.9%	Social phobia (social anxiety disorder): 5.5%	Social phobia (social anxiety disorder): 5.2%
									Panic disorder (with agoraphobia): 2.0% (3.4%)	Panic disorder (with agoraphobia): 3.9% (4.1%)	Panic disorder (with agoraphobia): 3.0% (3.8%)
									Specific phobia: 13.2%	Specific phobia: 17.9%	Specific phobia: 15.8%
2.	Adewuya et al. (2007)	Nigeria (Western)	CS Multistage sampling of secondary school students	1090	13-19	56.4	43.6	MINI International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) DSM-IV oriented	A 12-month diagnosis of at least one DSM-IV anxiety disorder: 11.4%	A 12-month diagnosis of at least one DSM-IV anxiety disorder: 19.6%	A 12-month diagnosis of at least one DSM-IV anxiety disorder: 15.0%
									Panic disorder (with or without agoraphobia): 1.8%	Panic disorder (with or without agoraphobia): 3.2%	Panic disorder (with or without agoraphobia): 2.4%
									Separation anxiety disorder: 2.1%	Separation anxiety disorder: 2.1%	Separation anxiety disorder: 2.1%
									Generalized anxiety disorder: 2.8%	Generalized anxiety disorder: 4.6%	Generalized anxiety disorder: 3.6%
									Specific anxiety disorder: 2.0%	Specific anxiety disorder: 3.2%	Specific anxiety disorder: 2.5%
									Obsessive compulsive disorder: 1.5%	Obsessive compulsive disorder: 2.1%	Obsessive compulsive disorder: 1.7%
									Posttraumatic stress disorder: 0.0%	Posttraumatic stress disorder: 0.4%	Posttraumatic stress disorder: 0.2%
											Social phobia (social anxiety disorder): 4.8%

									Social phobia (social anxiety disorder): 3.6%	Social phobia (social anxiety disorder): 6.3%	
3.	Demir et al. (2013)	Turkey	CS Two-stage cluster sampling of students between grade 4 to grade 8 from 3 schools	1482	9-16	49.8	50.2	Stage 1: The Social Anxiety Scale for Children-Revised (SASC-R) and the Capa Social Phobia Scale for Children and Adolescents (CSPSCA). Stage 2: The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL). DSM-IV oriented	Social Anxiety Disorder: 4 th - 5 th graders: 1.8% 6 th – 8 th graders: 3.2%	Social Anxiety Disorder: 4 th - 5 th graders: 3.5% 6 th – 8 th graders: 6.4%	Social Anxiety Disorder: 3.9%
4.	Nair et al. (2013)	India	CS A representative community sampling of adolescents from Kerela, southern India	500	11-19	36.6	63.4	The Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire DSM-IV-TR oriented	(Based on SCARED Indian Cutoff of ≥ 21) All Anxiety Disorders= 6.6% Panic Disorder= 7.4% Generalized Anxiety Disorders= 5.2%	(Based on SCARED Indian Cutoff of ≥ 21) All Anxiety Disorders= 19.2% Panic Disorder= 16% Generalized Anxiety Disorders= 13%	(Based on SCARED Indian Cutoff of ≥ 21) All Anxiety Disorders= 25.8% Panic Disorder= 23.4% Generalized Anxiety Disorders= 18.2%

									Separation Anxiety Disorder= 1.4%	Separation Anxiety Disorder= 7.6%	Separation Anxiety Disorder= 9.0%
									Social Anxiety Disorder= 5.6%	Social Anxiety Disorder= 14.6%	Social Anxiety Disorder= 20.2%
<i>Depressive Symptoms (22 studies)</i>											
5.	Adeniyi et al. (2011)	Nigeria	CS A stratified two-stage sampling of adolescents from 11 secondary schools (both public and private)	1100	12-17	48.9	51.1	The Children's Depression Inventory (CDI) DSM-IV oriented	-	-	Mild to moderate depression (CDI scores of 1-19) = 23.8% Definite depression (CDI scores of ≥ 20) = 5.7%
6.	Adewuyi et al. (2007)	Nigeria	CS Multistage sampling of secondary school students from 10 schools in Western Nigeria	1095	13-18	57.7	42.3	The Schedule for Affective Disorders and Schizophrenia for School-Aged Children – Epidemiological Version 5 (K-SADS-E) DSM-IV oriented	Major Depressive Disorder: 5.5%	Major Depressive Disorder: 8.9%	Major Depressive Disorder: 6.9%
7.	Hecker et al. (2016)	Tanzania	CS Random sampling of primary school	409	6-15	52.0	48.0	Children's Depression Inventory (CDI)			Depression (CDI scores cut-off point of ≥ 12) = 14%

			children from grades 2 to 7					DSM-IV oriented			
8.	Demir et al. (2011)	Turkey	CS Two-stage cluster sampling of students between grade 4 to grade 8 from 3 schools	1482	9-16	49.8	50.2	Stage 1: children were screened using the Child Depression Inventory (CDI)	Any depressive disorder: 3.65%	Any depressive disorder: 4.7%	Any depressive disorder: 4.2%
								Stage 2: According to the results of stage 1, 320 children were interviewed using the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL).	Major Depressive Disorder: 1.35%	Major Depressive Disorder: 1.74%	Major Depressive Disorder: 1.55%
									Dysthymic disorder: 1.21%	Dysthymic disorder: 2.28%	Dysthymic disorder: 1.75%
									Double depression (MDD super-imposed on dysthymia): 0.27%	Double depression (MDD super-imposed on dysthymia): 0.26%	Double depression (MDD super-imposed on dysthymia): 0.26%
									Depression-not otherwise specified: 0.81%	Depression-not otherwise specified: 0.4%	Depression-not otherwise specified: 0.6%
								DSM-IV oriented			
9.	El-Missiry et al. (2012)	Egypt	CS Multistage cluster sampling of female secondary school students from 6 schools in Cairo	602	14-17		100.0	The Children Depression Inventory (CDI) and the Non-patient version of the Structured Clinical	CDI (Egyptian adolescent depression cutoff of ≥ 24) =15.3%		
									SCID-I/NP (any depressive disorder)		

								Interview for DSM-IV axis-I disorders (SCID-I/NP)		=13.3% (current/point prevalence)	
								DSM-IV oriented			
10.	Fatiregun & Kumapayi (2014)	Nigeria	CS Stratified cluster sampling of adolescents from 7 secondary schools in southwest Nigeria	1713	10-19	44.7	55.3	The Patient Health Questionnaire (PHQ-9) for depression DSM-IV oriented			Depressed (≥ 10 scores on PHQ-9): 21.2% Severity of depression (based on PHQ-9): Mild depression (5-9)= 34.7% Moderate depression (10-14)= 16.1% Moderately severe depression (15-19)= 4.6% Severe depression (≥ 20)= 0.5%
11.	Ding et al. (2017)	China	CS Cluster sampling of children and adolescents from 5 primary and 5 secondary schools	6406	9-17	51.6	48.4	The Center for Epidemiological Studies Depression Scale (CES-D) DSM-IV oriented	Depressed (≥ 16 scores on CES-D)= 15.1%	Depressed (≥ 16 scores on CES-D)= 17.5%	Depressed (≥ 16 scores on CES-D)= 16.3%
12.	Karacetin et al. (2018)	Turkey	CS Multi-center epidemiological study of a representative	5842	8-10	51.7	48.3	The Kiddie Schedule for Affective Disorders and Schizophrenia for	Major depressive disorder (Without impairment criteria)= 1.6%	Major depressive disorder (Without impairment criteria)= 1.9%	Major depressive disorder (Without impairment criteria)= 1.7%

		sample of randomly selected students of 2 nd to 4 th grades from 29 study centers across 8 counties in Turkey					School Age Children- Present and Lifetime Version (K-SADS-PL)	(With impairment criteria)= 1.0%	(With impairment criteria)= 1.2%	(With impairment criteria)= 1.06%	
							Semi-structured interview based on DSM-III-TR and DSM-IV	Dysthymia (Without impairment criteria)= 0.1% (With impairment criteria)= 0.1%	Dysthymia (Without impairment criteria)= 0.1% (With impairment criteria)= 0.1%	Dysthymia (Without impairment criteria)= 0.2% (With impairment criteria)= 0.2%	
								Depressive disorder NOS (Without impairment criteria)= 0.1% (With impairment criteria)= 0.1%	Depressive disorder NOS (Without impairment criteria)= 0.1% (With impairment criteria)= 0.2%	Depressive disorder NOS (Without impairment criteria)= 0.15% (With impairment criteria)= 0.14%	
13.	Kinyanda et al. (2013)	Uganda (north-east)	CS	1587	3-19	46.3	53.7	The MINI International Neuropsychiatric Interview for children and adolescents (MINI-KID)	Any Depressive Disorders: 8.3%	Any Depressive Disorders: 8.8%	Any Depressive Disorders: 8.6%
			Multistage sampling of children and adolescents from a random selection of 210 households from each county across 4 districts of northeast Uganda					DSM-IV oriented	Major Depressive Disorder: 7.5%	Major Depressive Disorder: 7.6%	Major Depressive Disorder: 7.6%
									Dysthymia: 1.5%	Dysthymia: 2.7%	Dysthymia: 2.1%
14.	Li et al. (2017)	China	CS	1015	12-15	58.8	41.2	The Center for Epidemiological Studies-Depression scale (CES-D)	-	-	Mild depression (scores of CES-D \geq 16 and CES-D < 21) = 17.7%
			Convenience sampling of adolescents from 2					DSM-IV oriented			Moderate depression (scores of CES-D \geq 21)

		secondary schools in Guangzhou, mainland China.								and CES-D <25) = 10.1% Severe depression (scores of CES-D ≥25) = 13.4%	
15.	Munhoz et al. (2015)	Brazil (Pelotas)	CS Two-stage cluster sampling of households in Pelotas, Brazil having children and adolescents aged 10-19 years	743	10-19	48.3	51.7	The Patient Health Questionnaire-9 (PHQ-9) DSM-IV oriented	Depression (PHQ-9 scores ≥9): 13.9%	Depression (PHQ-9 scores ≥9): 19.8%	Depression (PHQ-9 scores ≥9): 17.0%
16.	Nalugya - Sserunjogi et al. (2016)	Uganda	CS A representative sample of adolescents from 4 secondary schools in central Uganda	519	14-16	58.0	42.0	Children's Depression Inventory (CDI) DSM-IV oriented	Depression (CDI scores cut-off point of ≥ 19) = 17%	Depression (CDI scores cut-off point of ≥ 19) = 26%	Depression (CDI scores cut-off point of ≥ 19) = 21%
17.	Perera et al. (2006)	Sri Lanka	CS Random sampling survey of students from 3 schools	891	14-19	49.5	50.5	The Center for Epidemiological Studies-Depression Scale (CES-D) DSM-IV oriented	Depression (CES-D cut-off scores of ≥16)= 58.5%	Depression (CES-D cut-off scores of ≥16)= 56.9%	Depression (CES-D cut-off scores of ≥16)= 57.7%
18.	Rahman et al (2009)	Pakistan	CS Community-based survey of	321	16-18	0.0	100.0	The Structured Clinical Interview		Major Depressive Disorder (based on	

							all 16 to 18-year old unmarried adolescents in one rural community in Rawalpindi District, koori Dulal	for DSM-IV Disorders (SCID) DSM-IV oriented	SCID assessment)= 4.4%
19.	Rodrigo et al. (2010)	Sri Lanka	CS Random sampling of students from 2 random schools	445	14-18	54.4	45.6	The Center for epidemiologic studies depression scale (CES-D) DSM-IV oriented	Mild Depression (CES-D scores of 16-21)= 17% Severe Depression (CES-D cut-off scores of ≥ 21)= 19%
20.	Sarkar et al. (2012)	India	CS Two-staged sampling of students of grades 1 to 7 from 4 randomly selected schools in the sub-urban area of Kanke, Ranchi.	1851	8-12	32.9	67.1	The Schedule for Affective Disorders and Schizophrenia for School Age Children Present and Lifetime Version (K-SADS-PL) DSM-IV oriented	Any Depressive disorders= 3.13% Major depressive disorder= 0.81% Dysthymia= 1.51% Depressive disorder NOS= 0.81%
21.	Shaaban & Baashar (2003)	Sudan	CS Two-stage, stratified random sampling of adolescent	1107	12-19		100.0	The Beck Depression Inventory (BDI) DSM-IV oriented	Overall Depression (BDI scores of 8-39) = 39.4%

		schoolgirls from 6 randomly selected elementary and secondary girls' schools in Khartoum, Sudan								Moderate Depression (BDI scores of 8-15) = 28.2%	
										Severe Depression (BDI cut-off scores of ≥ 16) = 11.2%	
										Major Depressive Disorder (DSM-IV)= 4.2%	
22.	Silva et al. (2011)	Brazil Cohort follow-up study of school children sample from Ribeirão Preto (more developed centre, n =790) and São Luís (less developed centre, n =673) born between 1994 and 1998	1463	7-11	48.7	51.3	The Children's Depression Inventory (CDI) DSM-IV oriented	-	-		Depression (CDI cut-off scores of ≥ 17) weighted in Ribeirão Preto = 6.0% Depression (CDI cut-off scores of ≥ 17) weighted in São Luís weighted = 21.6%
23.	Somrongthong et al. (2013)	Thailand (Bangkok) CS Survey study of adolescents living in a slum community selected through systematic random	623	12-17	43.5	56.5	The Center for Epidemiologic Studies Depression scale (CES-D) DSM-IV oriented	Depression (CES-D cut-off scores of ≥ 22) = 27.4%	Depression (CES-D cut-off scores of ≥ 22) = 42.3%	Depression (CES-D cut-off scores of ≥ 22) = 36.1%	

			sampling of households								
24.	Toros et al. (2004)	Turkey	CS A multistage, stratified cluster sampling of randomly selected 18 secondary and high schools in Mersin, Turkey	4134	10-20	54.4	45.6	The Child Beck Depression Inventory (CBDI) DSM-IV oriented	Depression (CBDI cuff-off scores of ≥ 19) = 6.6%	Depression (CBDI cuff-off scores of ≥ 19) = 5.9%	Depression (CBDI cuff-off scores of ≥ 19) = 12.5%
25.	Wang et al. (2016)	China (western)	CS A multistage, stratified cluster, random sampling of children and adolescents from 24 primary schools and 25 high schools	10657	7-17	53.4	46.6	The Children's Depression Inventory (CDI) DSM-IV oriented	Depression (CDI cuff-off scores of ≥ 19) = 23.3%	Depression (CDI cuff-off scores of ≥ 19) = 24.7%	Depression (CDI cuff-off scores of ≥ 19) = 23.9%
26.	Zhong et al. (2013)	China	CS Community Study using multistage, stratified cluster sampling of children and adolescents from randomly selected	3582	6-14	52.4	47.6	The Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) DSM-IV oriented	Any Depressive Disorder = 2.0% Major Depressive Disorder = 1.1% Dysthymia = 0.3% Minor depressive disorder = 0.6%	Any Depressive Disorder = 3.6% Major Depressive Disorder = 1.8% Dysthymia = 0.5% Minor depressive disorder = 1.3%	Any Depressive Disorder = 2.8% Major Depressive Disorder = 1.4% Dysthymia = 0.4% Minor depressive disorder = 0.9%

communities and households											
<i>Both anxiety and depressive Symptoms (17 studies)</i>											
27.	Abubakar-Abdulleef et al. (2017)	Nigeria (North west)	CS Multistage sampling of children from 3 public schools	200	5-19	100.0	-	The Schedule for Affective Disorders and Schizophrenia for School-aged Children Present and Lifetime Version (K-SADS-PL) DSM-IV oriented	-	-	Any psychiatric condition: 37.0% Depression: 8.1% Mania: 1.0% Separation anxiety: 14.0% Generalized anxiety disorder: 8.1% Obsessive compulsive disorder: 2.5% Posttraumatic Stress Disorder: 4.0% Agoraphobia: 3.0% Social phobia: 2.5%
28.	Al-Jawadi & Abdul-Rhman (2007)	Iraq	CS Systematic random sampling of children and families from 2 primary community	3079	1-15	55.1	44.9	Standardized questionnaire including diagnostic criteria taken from DSM-IV-TR	Separation anxiety disorder = 4.2% Specific Phobia= 2.1% Post-Traumatic Stress disorder = 7.8%	Separation anxiety disorder = 4.5% Specific Phobia= 4.9%	Separation anxiety disorder = 4.3% Specific Phobia= 3.3% Post-Traumatic Stress disorder = 10.5%

		healthcare centres in Mosul, Iraq						Depression = 1.2%	Post-Traumatic Stress disorder = 13.8%	Depression = 1.5%	
									Depression = 1.9%		
29.	Anselmi et al. (2010)	Brazil	CS 1993 Brazilian Birth Cohort Study-cohort follow-up during 2004-2005; home visits conducted	479	11-12	49.7	50.3	The Development and Well-Being Assessment for Children and Adolescents parental version (DAWBA) DSM-IV & ICD-10 oriented	-	-	At least one psychiatric disorder according to DSM-IV or ICD-10: 10.8% Any anxiety disorder: 6.0% (DSM-IV); 6.2% (ICD-10) Separation anxiety disorder: 0.7% (DSM-IV); 0.8% (ICD-10) Specific phobia: 1.4% (DSM-IV & ICD-10) Social phobia: 0.1% (DSM-IV & ICD-10) Obsessive compulsive disorder: 0.1% (DSM-IV & ICD-10) Generalized anxiety disorder: 1.4% (DSM-IV & ICD-10)

										Posttraumatic stress disorder: 0.1% (DSM-IV) Other anxiety disorder: 2.2% (DSM-IV); 2.3% (ICD-10) Any depressive disorder: 1.6% (DSM-IV & ICD-10) Major depression: 1.6% (DSM-IV); 0.9% (ICD-10) Other depressive disorder: 0.1% (DSM-IV); 0.7% (ICD-10) Agoraphobia: 0.1% (ICD-10)	
30.	Benjet et al. (2009)	Mexico	CS National Mental Health Survey of adolescents selected from a stratified multistage area probability sample	3005	12-17	47.9	52.1	The World Mental Health version of the Adolescent Composite International Diagnostic Interview (WMH-CIDI-A) DSM-IV (12-month prevalence) oriented	Any psychiatric disorder (DSM-IV) prevalent over 12-month: 1.0%	Any psychiatric disorder (DSM-IV) prevalent over 12-month: 1.38%	Any anxiety disorder: 29.8% Panic disorder: 1.6% Generalized anxiety disorder: 0.5% Agoraphobia: 3.6% Social phobia: 11.2% Specific phobia: 20.9%

											Separation anxiety: 2.6%
											Posttraumatic stress disorder: 1.0%
											Any mood disorder: 7.2%
											Major depressive disorder: 4.8%
											Dysthymia: 0.5%
											Bipolar disorder: 2.5%
31.	Cortina et al (2013)	South Africa	CS Stratified random sampling of primary students from 10 primary schools	1025	10-12	50.8	49.2	The Youth Self Report (YSR) anxious/depressed scale DSM-IV oriented	-	-	YSR scores in the clinical range of anxious/depressed scale: 14.1%
32.	Dos Santos et al. (2016)	Brazil	CS Part of cohort study of children randomly selected through stratified sampling within city of Salvador in 2001	349	4-6	54.7	45.3	The Child Behavior Checklist (CBCL) DSM-IV oriented			Internalizing problems (based on clinical scores of CBCL) = 9.7% Anxiety/Depression (based on clinical scores of CBCL) = 8.3%

33.	Kariuki et al. (2017)	Kenya (Mom basa)	CS Community sample of families with children aged 3–5, randomly selected through the Kilifi Health and Demographic Surveillance System (KHDSS) across Kenyan rural area	3273	3-5	51.0	49.0	Child Behavior Checklist (CBCL) DSM-IV oriented	Internalizing problems (based on CBCL): 23%	Internalizing problems (based on CBCL): 22%	Internalizing problems (based on CBCL): 22% Anxious/depressed (based on CBCL): 12.7%
34.	Khaleghi et al. (2018)	Iran (Tehran)	CS Multistage (cluster and stratified) random sampling of children and adolescents from 350 clusters from all district of Tehran; 6 households randomly selected from each cluster.	2095	6-18	51.4	48.6	The Schedule for Affective Disorders and Schizophrenia for School-Age Children/Present and Lifetime Version (K-SADS-PL) DSM-IV (semi-structured Interview) oriented	Any Psychiatric Disorders: 30.5% (95% CI)	Any Psychiatric Disorders: 25.7% (95% CI)	Any Psychiatric Disorders: 28.2% (95% CI) Any Mood Disorders: 2.8% Depressive Disorders: 2.3% Mania: 0.4% Hypomania: 0.7% Any Anxiety Disorders: 21.9% Panic disorder: 0.2% Separation Anxiety Disorder: 6.9% Social Phobia: 1.9% Specific Phobia: 9.9%

											Agoraphobia: 5.2% Generalized Anxiety Disorder: 2.8% Obsessive Compulsive Disorder: 7.8% Post Traumatic Stress Disorder: 0.4%
35.	Kinyanda et al. (2011)	Uganda (north-east)	CS Multistage sampling of children and adolescents from a random selection of 210 households from each county across 4 districts of northeast Uganda	897	10-19	47.1	52.9	The MINI International Neuropsychiatric Interview for children and adolescents (MINI-KID) DSM-IV oriented	-	-	DSM-IV mental disorder syndromes: Depressive disorder syndromes: 11.6% Anxiety disorder syndromes: 27.6%
36.	Maalouf et al. (2016)	Lebanon	CS Community multistage cluster sampling of households from different areas within Beirut	510	11-17	56.1	43.9	The Development and well-being assessment (DAWBA) DSM-IV and ICD-10 oriented	Emotional disorders= 13.6% Mood disorders= 4.5% Anxiety disorders= 10.8%	Emotional disorders= 21.4% Mood disorders= 9.4% Anxiety disorders= 16.1%	Emotional disorders= 17.1% Mood disorders= 6.7% Anxiety disorders= 13.1%
37.	Sabet et al. (2009)	South Africa	CS Cohort study Data collection drawn from the Birth to Twenty (BT20) cohort	1029	11-12	45.4	54.6	The Youth Self-Report (YSR) DSM-IV oriented	-	-	YSR Internalizing Problems = 41.2% YSR Anxious/depressed scale = 23.2%

							study when children were aged 11 to 12 years.				YSR Withdrawn/depressed scale = 1.4%
38.	Shen et al. (2018)	China	CS Two-stage, stratified sampling of children and adolescents from 13 randomly selected urban and rural schools in Hunan, China	17071	6-16	51.8 48.2	The Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) DSM-IV oriented	Any psychiatric disorders = 11.79%	Any psychiatric disorders = 7.55%	Any psychiatric disorders = 9.74%	
								Generalized Anxiety Disorder = 1.29%	Generalized Anxiety Disorder = 2.28%	Generalized Anxiety Disorder = 1.77%	
								Separation Anxiety Disorder = 0	Separation Anxiety Disorder = 0.04%	Separation Anxiety Disorder = 0.02%	
								Post-Traumatic Stress Disorder = 0.01%	Post-Traumatic Stress Disorder = 0.04%	Post-Traumatic Stress Disorder = 0.02%	
								Obsessive Compulsive Disorder = 0.51%	Obsessive Compulsive Disorder = 0.64%	Obsessive Compulsive Disorder = 0.57%	
								Social Phobia = 0.07%		Social Phobia = 0.07%	
								Specific Phobia = 0.67%	Social Phobia = 0.07%	Specific Phobia = 0.74%	
								Major Depressive Disorder = 0.34%	Specific Phobia = 0.81%	Major Depressive Disorder = 0.61%	
								Dysthymia = 0.1%	Major Depressive Disorder = 0.90%	Dysthymia = 0.17%	
								Mania = 0.25%		Mania = 0.15%	
									Dysthymia = 0.24%		
									Mania = 0.04%		

39. Panter-Brick et al. (2009)	Afghanistan	CS Stratified random sampling of students attending 25 government-operated schools in 3 regions	1011	11-16	49.8	50.2	The Birleson Depression Self-Rating Scale (DSRS) – cutoff \geq 15 (depressed)	Children’s Revised Impact of Events Scale (CRIES-13) – cutoff \geq 17 (high range)	DSM-IV and ICD-10 oriented	Anxiety (based on CRIES cutoff scores \geq 17)= 21.1%	Anxiety (based on CRIES cutoff scores \geq 17)= 26.8%	Depression (based on DSRS cutoff scores \geq 15)= 22.2%	Anxiety (based on CRIES cutoff scores \geq 17)= 23.9%						
40. Petresco et al. (2014)	Brazil (Pelotas)	CS Cohort sample of all hospital births in city of Pelotas between January 1-December 31, 2004; survey carried out at 5 th follow-up with children of the Pelotas birth Cohort at age 6.	3585	Age 6 only	51.3	48.7	The Development and Well-Being Assessment (DAWBA)	DSM-IV and ICD-10 oriented	At least one psychiatric disorder according to DSM-IV or ICD-10= 14.4%	Any anxiety disorder: 8.8% (DSM-IV); 8.4% (ICD-10)	Any depressive disorder: 1.5% (DSM-IV & ICD-10)	At least one psychiatric disorder according to DSM-IV or ICD-10= 11.5%	Any anxiety disorder: 8.8% (DSM-IV & ICD-10)	Any depressive disorder: 1.1% (DSM-IV & ICD-10)	At least one psychiatric disorder according to DSM-IV or ICD-10= 13%	Any anxiety disorder: 8.8% (DSM-IV); 8.6% (ICD-10)	Separation anxiety disorder: 3.2% (DSM-IV); 2.9% (ICD-10)	Specific phobia: 5.4% (DSM-IV & ICD-10)	Social phobia: 0.1% (DSM-IV & ICD-10)

									<p>Obsessive compulsive disorder: 0.2% (DSM-IV & ICD-10)</p> <p>Generalized anxiety disorder: 0.2% (DSM-IV & ICD-10)</p> <p>Posttraumatic stress disorder: 0.8% (DSM-IV); 0.7% (ICD-10)</p> <p>Other anxiety disorder: 0.1% (DSM-IV & ICD-10)</p> <p>Agoraphobia: 0.03% (DSM-IV & ICD-10)</p> <p>Any depressive disorder: 1.3% (DSM-IV & ICD-10)</p> <p>Minor depression: 1.2% (DSM-IV); 0.5% (ICD-10)</p> <p>Major depression: 0.08% (DSM-IV & ICD-10)</p>
41. Pillai et al. (2008)	India (Goa)	CS Population-based survey of all eligible	2048	12-16	50.3	49.7	The Development and Well-Being Assessment (DAWBA)		At least one psychiatric disorder according to DSM-IV (95% CI) = 1.81%

								adolescents from 10 randomly selected rural and urban communities	DSM-IV and ICD-10 oriented	Any Anxiety disorders= 1.0% Any Depressive disorders= 0.5%
42.	Weiss et al. (2014)	Vietnam	CS	591	6-16	50.0	50.0	National survey using cluster sampling of children and adolescents from urban, near-urban, and rural communities in 10 provinces.	Child Behavior Checklist (CBCL) Or Youth Self-Report (YSR) DSM-IV oriented	CBCL/YSR Internalizing Problems = 18.5% – 20.0% CBCL/YSR Anxious/depressed scale = 7.3% – 8.6% CBCL/YSR Withdrawn/depressed scale = 5.1% – 6.3%
43.	Xu et al. (2011)	China	CS	3019	13-18	51.7	48.3	Random sampling of students from 3 junior and 3 high schools in Hefei, eastern China	Beck Depression Inventory (BDI), Self-rating Anxiety Scale (SAS) Both DSM-IV oriented	Depression symptoms (BDI cuff-off scores of ≥ 14) = 11% Anxiety symptoms (SAS cuff-off scores of ≥ 50) = 21.5%

3.4.3. Study Settings

43 studies met the inclusion and exclusion criteria of this review. The 43 studies represented 20 out of the 138 countries categorised as having low- and middle-income economies. Specifically, three studies covered populations classified as low-income (Afghanistan, Uganda, and Tanzania), eight were classified as lower-middle-income (Egypt, India, Kenya, Pakistan, Nigeria, Sri Lanka, Sudan, and Vietnam) and nine were classified as upper-middle-income (Brazil, China, Iran, Iraq, Lebanon, Mexico, South Africa, Thailand, and Turkey).

3.4.4. Study Designs

All but five of the studies (Anselmi et al., 2010; dos Santos et al., 2016; Petresco et al., 2014; Sabet et al., 2009; Silva et al., 2011) involved cross-sectional surveys. These five studies used a cohort design and reported sample data using cross-sectional methods where two or more distinct age cohorts were tracked and assessed over a number of years.

3.4.5. Participants

The 43 studies involved a total of 95,512 participants aged between 1 to 20 years (52% female and 48% male) who were assessed for emotional problems. In this review, there was one study (Toros et al., 2004) which had only one participant aged 20 years old and attending the same high school as the rest of the sample. Hence, while considering WHO's (2011) recommendation and the very low percentage of the sample aged 20 years, it was considered appropriate to include this study in the review. Moreover, three studies (El-Missiry et al., 2012; Rahman et al., 2009; Shaaban and Baashar, 2003), which were carried out in Pakistan, Sudan and Egypt respectively, assessed females only, whereas one study (Abubakar-Abdullateef et al., 2017), conducted in Nigeria, assessed males only. In these four

gender-specific studies, the recruitment of participants was carried out using multistage random sampling. Due to the large sizes of populations being tested, the selection of participants underwent two stages: firstly, the selection of eligible clusters, then, the selection of sample from individuals of these clusters. This sampling step in the four gender-specific studies was done in a bid to ensure that the sample fell within the age range for inclusion in the study, hence it was deemed justifiable to include these studies in the review. Representing 45% of the total sample, participants aged between 1 to 19 years were examined for both anxiety and depression related problems. Only 5% of participants, ranging from the age of 3 to 19 years, were examined for anxiety related problems alone, whereas 50% of participants aged 3 to 20 years old were assessed for depression related problems only.

3.4.6. Place of sample recruitment

Twenty-four studies recruited participants through multistage sampling of primary and secondary schools. In 14 studies, participants were recruited from a population-based setting in which they were selected through multistage random selection of households. One study recruited children through four healthcare centres in the city (Al-Jawadi & Abdul-Rhman, 2007). The healthcare centres were national centres for vaccination initiated by the national government, whereby parents were required to bring their children for vaccination and were invited to participate in a survey alongside this. Two studies assessed birth cohort participants through home visit follow-ups (Anselmi et al., 2010; dos Santos et al., 2016). One specific cohort study conducted a follow-up with participants who were invited to be assessed at collection sites which were any of two hospitals in two different cities of the country (Sabet et al., 2009). In another cohort study, participants were invited for assessment at a research clinic, and if not feasible, assessments were conducted through home visits (Petresco et al., 2014). The experiences of the children and adolescents in the above studies

still represented those in the general community and therefore the studies were included in the review.

3.4.7. Types of Emotional Problems Examined

Emotional problems were commonly classified within the broad category of internalising problems, which includes anxiety and depression as the two primary components (Achenbach & Rescorla, 2001). All studies included in the review, whether they were examining emotional problems, mental health problems, mental disorders or psychiatric disorders, had at least one outcome measure of anxiety and/or depression. 39.5% ($n = 17$) of the studies examined participants for both anxiety and depression-related problems. The samples were examined for anxiety-related problems only in 9.3% ($n = 4$) of the studies, whereas depression-related problems only were assessed in 51.2% ($n = 22$) of the studies.

3.4.8. Measures Used for Assessing Emotional Problems in LMICs

All studies used standardised instruments and/or diagnostic interviews to assess anxiety and depression related problems.

3.4.8.1. *Depression-related Problems*

Across the 22 studies that assessed only depression-related problems, eight different standardised instruments were used with a total sample of 47,587 participants. The most widely used instrument was the Children's Depression Inventory (CDI) (Kovacs, 1981), which was utilised across seven studies with cut-off scores ranging from 12 to 24 for the screening of depression. The second most used instrument was the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977) which was used across five studies with cut-off scores ranging from 16 to 22, depicting elevated depressive

symptoms. The Kiddie Schedule for Affective Disorders and Schizophrenia for School Age Children-Present and Lifetime Version (K-SADS-PL) (Kaufman, Birmaher, Brent et al., 1997) and the Epidemiological Version 5 (K-SADS-E) (Orvaschel, 1995), semi-structured interviews based on DSM-III-TR and DSM-IV, were used in three studies. Additionally, based on DSM-IV criteria, the MINI International Neuropsychiatric Interview for children and adolescents (MINI-KID) (Sheehan, Sheehan, Shytle et al., 2010), a structured clinical diagnostic interview, was used in two studies. The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson et al., 1961) was used in two studies, with cut-off scores ranging from 8 to 19. The Patient Health Questionnaire (PHQ-9) for depression (Kroenke, Spitzer, & Williams, 2001; Kroenke & Spitzer, 2002; Spitzer, Kroenke, & Williams, 1999) was used in two studies: one study using cut-off scores ≥ 5 to depict depression, while the other study used a diagnostic algorithm of the PHQ-9 to screen for depression (i.e. the presence of two or more depressive symptoms, with at least one symptom being depressed mood). Another study used the Structured Clinical Interview for DSM-IV Disorders (SCID) (First, Spitzer, Gibbon et al., 1995) for the diagnosis of depression.

Precisely, two studies used a two-stage design. Children ($n = 1095$) in Adewuya et al. (2007b) were firstly screened using the BDI (Beck et al., 1961) and based on their scores, a subset ($n = 454$) were further interviewed for DSM-IV diagnosis of depression with the K-SADS-E (Orvaschel, 1995). Likewise, in Demir et al. (2011), participants ($n = 1482$) were screened using the CDI (Kovacs, 1981) and based on the results, a subset ($n = 320$) was interviewed with the K-SADS-PL (Kaufman et al., 1997). El-Missiry et al. (2012) used both the CDI (Kovacs, 1981) and the Non-patient version of the Structured Clinical Interview for DSM-IV axis-I disorders (SCID-I/NP) (First et al., 1995) for the diagnosis of depression.

3.4.8.2. *Anxiety-related Problems*

In the four studies assessing only anxiety symptoms, three different standardised measures were used among the sample of children and adolescents ($N = 4659$). Two studies used the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) (Sheehan et al., 2010), a brief structured interview for the major Axis I psychiatric disorders in DSM-IV and DSM-IV-TR criteria with specific algorithms for diagnosis of depression. One study used the Screen for Child Anxiety Related Emotional Disorders (SCARED) (Birmaher, Brent, Chiapetta et al., 1999) with cut-off scores ≥ 21 depicting depressive symptoms. Another study used a 2-stage design. Participants ($n = 1482$) were screened in stage 1 with the Social Anxiety Scale for Children-Revised (SASC-R) (Demir, Eralp-Demir, Turksoy et al., 2000) and the Capa Social Phobia Scale for Children and Adolescents (CSPSCA) (Demir, Eralp-Demir, Ozmen et al., 1999). Based on the results of stage 1, stage 2 involved diagnostic interviews of the sample ($n = 324$) using the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL).

3.4.8.3. *Emotional Problems (Anxiety and Depressive symptoms)*

The 17 studies which assessed both anxiety and depression-related problems, used 11 different standardised instruments that measured emotional problems (including anxiety and depression) among a sample of 43,266 children and adolescents. The most widely used instrument across four studies was the Development and Well-Being Assessment for Children and Adolescents (DAWBA) (Goodman, Ford, Richards et al., 2000). Based on DSM-IV and ICD-10 criteria, the DAWBA is an integrated package of questionnaires, interviews and rating techniques designed to generate best-estimate psychiatric diagnoses in children and adolescents. In these studies, information including open-ended questions was

gathered from both youngsters and parents. This was then reviewed by mental health professionals to verify or overrule the generated diagnoses. Two studies used the Youth Self Report (YSR) – anxious/depressed scale (Achenbach, 1991), making use of cut-off scores ≥ 60 to differentiate youth in the clinical range for anxiety and depression. Two studies made use of the Child Behaviour Checklist (CBCL) (Achenbach & Rescorla, 2001), using cut-off scores ≥ 60 to depict clinical internalising problems among young people. One study used both the YSR (Achenbach, 1991) and the CBCL (Achenbach & Rescorla, 2001) to investigate internalising problems of anxiety and depression among children and adolescents. Two studies used the MINI-KID (Sheehan et al., 2010), two studies made use of the K-SADS-PL (Kaufman et al., 1997), and one study used a standardized diagnostic criteria questionnaire based on DSM-IV-TR (APA, 2000). These structured diagnostic interviews were used to assess current and past psychopathology pertaining to anxiety and depressive problems.

One study used the World Mental Health version of the Adolescent Composite International Diagnostic Interview (WMH-CIDI-A), a downward extension of the adult version of the WMH-CIDI which is a diagnostic tool for affective problems such as anxiety and depression. Two studies used two separate scales to assess depression and anxiety severity. One study used the Birlerson Depression Self Rating Scale (DSRS) (Birlerson, Hudson, Buchanan et al., 1987) with cut-off scores ≥ 15 and the Children's Revised Impact of Events Scale (CRIES-13) (Children and War Foundation, 2005; Smith, Perrin, Yule et al., 2001) with cut-off scores ≥ 17 to assess depression and anxiety severity respectively. The other study used BDI (Beck et al., 1961) with cut-off scores ≥ 14 to assess depression and the self-rating Anxiety Scale (SAS) (Zung, 1971; Leentjens, Dujardin, Marsh et al., 2008) with cut-off scores ≥ 50 to classify as high anxiety.

3.4.9. Prevalence Estimates of Emotional Problems

The prevalence of emotional problems from the 43 studies between the ages of 1 to 20 years were extracted. In some studies, authors reported prevalence rates for the individual depression and anxiety disorders, in addition, to ‘any anxiety diagnosis’, or ‘any depressive diagnosis’. In these cases, the ‘any anxiety diagnosis’ and ‘any depressive diagnosis’ figures were used for the total prevalence. The general and specific individual prevalence rates of the diagnoses and/or severity of emotional problems are presented in Table 2.

3.4.9.1. *Depression-related Problems*

Thirty-four studies, including 84,586 child and adolescent participants, provided data based on standardised instruments and/or diagnostic interviews on depression-related problems. Seventeen studies reported data from standardised measures depicting mild to severe depression and 17 studies reported data from diagnostic interviews depicting any depressive disorder, including major depressive disorder, dysthymia, and depressive disorders not otherwise specified (NOS). Depression, being one of the most important challenges in global mental health, had a prevalence estimate ranging from 1% to 58% among children and adolescents in LMICs.

3.4.9.2. *Anxiety-related Problems*

Sixteen studies, including 41,658 child and adolescent participants, provided data based on standardised instruments and/or diagnostic interviews on anxiety-related problems. Seven studies reported data from standardised measures depicting mild to severe anxiety and nine studies reported data from diagnostic interviews depicting any anxiety disorders, including generalised anxiety disorder, separation anxiety disorder, panic disorder, social phobia (social anxiety disorder), panic with agoraphobia, specific phobia, obsessive

compulsive disorder and posttraumatic stress disorder. The prevalence estimates for anxiety-related problems ranged from 1% to 30% among children and adolescents in LMICs.

3.4.9.3. Emotional Problems (both anxiety and depression)

Seventeen studies, including 43,266 child and adolescent participants, provided data based on standardised instruments and/or diagnostic interviews on emotional problems, including both anxiety- and depression-related problems. Eight studies reported data of sample from standardised measures depicting mild to severe emotional problems and 9 studies reported data from diagnostic interviews depicting any anxiety and depression disorders based on DSM or ICD diagnostic criteria. The prevalence estimates for emotional problems ranged from 2% to 41% among children and adolescents in LMICs.

3.4.10. Gender Differences in Prevalence Estimates

Data across the 43 studies were analysed for any gender differences in the prevalence estimates. Nine studies investigated for gender differences in anxiety among children and adolescents in LMICs. The prevalence estimate for any anxiety-related problem was higher for females, ranging from 5% to 30%, than for males, which ranged from 1% to 23%. For all the specific anxiety-related problems, the prevalence estimates for females were higher than for males in relation to symptoms of separation anxiety (23% vs. 6%), generalised anxiety (7% vs. 3%), panic (8% vs. 5%), social phobia/social anxiety (15% vs. 6%), specific phobia (18% vs. 13%), panic with agoraphobia (4% vs. 2%), obsessive-compulsive (2% vs. 1%) and posttraumatic stress (27% vs. 8%).

Moreover, 15 studies investigated gender differences in depression among children and adolescents in LMICs. Across 13 studies, the prevalence estimates for any depressive-related problem were higher for females, ranging from 2% to 42%, than for males, ranging

from 1% to 27%. However, in two studies, males (7%–58%) reported higher depression prevalence rates than females (6%–57%). The prevalence estimates for depressive symptoms not otherwise specified (NOS) was slightly higher for males than for females (1% vs. 0.4%), whereas the prevalence estimates were higher for females than for males for both major depressive symptoms (9% vs. 8%) and dysthymia (3% vs 2%).

Only seven studies investigated gender differences in emotional problems (any anxiety and/or depressive diagnosis) among children and adolescents in LMICs. Interestingly, across four studies, the prevalence rates for any emotional problems were higher for males, ranging from 8% to 30%, than for females, which ranged from 8% to 26%. While in three studies, the prevalence rates for females ranged from 14% to 27%, higher than the prevalence rates for males, ranging from 8% to 21%. Out of the 43 studies, 17 studies did not provide separate prevalence data for males and females, while three studies provided gender-specific prevalence data (see Table 2).

3.5. Discussion

This review examined 43 studies reporting on emotional problems experienced by 95,512 children and adolescents living in 20 LMICs. The first research question examined the types of emotional problems in LMICs. The studies varied less in how much they discussed the definition, conceptualisation and types of emotional problems experienced by young people. However, most studies acknowledged that emotional problems among children and adolescents are increasing mental health concerns around the globe. The prevalence of emotional problems in LMICs seems to be higher in LMICs as compared to HICs. It could be speculated that the higher prevalence relates to the challenges in mental health policy faced by LMICs (Zhou et al., 2016). For instance, poorer social and environmental circumstances, poor public awareness, low political willingness, mental health stigma, shortage of mental

health resources and biased cultural values towards children and adolescents' emotional wellbeing may contribute to a heightened risk of emotional problems. Knowledge of the types of emotional problems and their impact on the lives of children and adolescents were evidenced in the review's studies. Investigating the prevalence of emotional problems was considered as the first step towards determining the magnitude of the problem. Hence, despite ethnic, cultural, economic and social differences across the 20 LMICs included in the review, all 43 studies examined emotional problems as internalising problems or mental health problems which were comprised of anxiety and/or depressive symptoms.

The second research question this review sought to answer concerned the methods used to assess prevalence of emotional problems among children and adolescents in LMICs. Emotional problems of anxiety and depression were investigated through varied methodological approaches. Hence, comparability between the methodology of these studies is limited owing to the different standardised instruments and diagnostic interviews used for assessment. The measures used in LMICs seem comparable to those used among HICs. Some of the most used standardised instruments in LMICs included the Child Depression Inventory (CDI) (Kovacs, 1981, 1992), the Beck Depression Inventory (BDI) (Beck et al., 1961), and the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977). While the Kiddie Schedule for Affective Disorders and Schizophrenia for School Age Children-Present and Lifetime Version and the Epidemiological version (K-SADS-PL; Kaufman et al., 1997; K-SADS-E; Orvaschel, 1995), the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) (Sheehan et al., 2010) and the Development and Well-Being Assessment for Children and Adolescents (DAWBA) (Goodman et al., 2000) were the most used diagnostic interviews across the studies. In total, studies measuring anxiety used three different instruments, studies measuring depression used eight different assessments and studies measuring both anxiety and depression used 11 different measures.

Nevertheless, all the methodological approaches of the studies were derived from the two most used diagnostic systems, the DSM and the ICD.

A few studies used a one-stage design in which diagnostic interviews or instruments were used to assess an entire sample of the population. This design provides a strong methodological basis for assessing prevalence rates. However, it is costly and time-consuming, limiting its feasibility. To address these limitations, some studies used a two-stage design whereby the entire sample is screened for emotional problems and subsequently, youth who are screened with high scores and youth who are screened with low scores are further selected for the diagnostic phase. With proper screening methods and appropriate cut-offs points and clinician-led or trained interviewers, prevalence rates may be estimated effectively. However, these important elements are found to be frequently inconsistent across studies and thus may impact on the resulting prevalence rates (Achenbach, Becker, Dopfner et al., 2008; Gómez-Beneyto, Bonet, Catalá et al., 1994; Kroes, Kalff, Kessels et al., 2001).

The third research question sought to address the prevalence of emotional problems among young people in LMICs. An estimated prevalence from 1% to 58% for depression, and from 1% to 30% for anxiety was found. An overall prevalence for emotional problems ranged from 2% to 41% among children and adolescents in LMICs. The review findings for anxiety are comparable to the reported prevalence estimates of up to 32% for children and adolescents in HICs (Essau et al., 2000; Merikangas et al., 2010). However, the review's findings for depression and emotional problems are much higher than the reported prevalence rate of up to 25% in HICs (Costello et al., 2005b; Deighton et al., 2019; Lawrence et al., 2015; Phillips & Yu, 2021; Rancans et al., 2014). Since most children and adolescents across the world live in LMICs, these prevalence rates translate into an enormous number of affected youth leading to major youth mental health implications, and the impact may be more detrimental (Roberts, Attkisson, & Rosenblatt, 1998; Saxena, Paraje, Sharan et al.,

2006; Patel & Sumathipala, 2001). Emotional problems such as anxiety and depression symptoms limit an individual's psychosocial functioning, diminishing the quality of life, and are frequently associated with substantial burdens and psychological, medical and financial costs not only for the individuals and their families, but also for society as a whole (Lim et al., 2018).

It is important to note that 14 studies included in the review covered Sub-Saharan African countries, where rates of emotional problems are particularly elevated, with prevalence of anxiety and depression ranging from 20% to 60% (Cortina, Sodha, Fazel et al., 2012; Dessauvage, Jörns-Presentati, Napp et al., 2020; Jamison, Feachem, Malegapuru et al., 2006; Yatham et al., 2017). Moreover, all of the studies included in the review form part of the Global South, a term usually denoted for countries with low- and middle-income and often politically and/or culturally marginalised (Dados & Connell, 2012). An increased prevalence of emotional problems in the Global South may relate to social, cultural, economic and environmental risk factors, which can impact on children and adolescents directly or indirectly (Mills & Fernando, 2014; Pedersen et al., 2019).

The review indicates that types of anxiety problems with the highest prevalence estimates related to symptoms of generalised anxiety (30%), separation anxiety (29%), posttraumatic stress (24%), specific phobia (21%) and social phobia/social anxiety (20%). While it was beyond the scope of the present study to examine factors that put young people at risk of developing anxiety and depression, studies have suggested that existing and emerging social, cultural and economic difficulties in LMICs increase the vulnerability to these different types of anxiety and depressive symptom (Maselko, 2017; Rathod et al., 2017). One key risk factor to this increased vulnerability may relate to the higher number of left-behind children and adolescents in LMICs by one or both migrant parents. A systematic review of 111 studies (Fellmeth et al., 2018) highlighted the detrimental impact of parental

migration on left-behind children's mental health, with 85% experiencing an increased risk of anxiety and 52% having an increased risk of depression. Experience of early parental separation and insecure attachment also increase emotional problems, such as low self-esteem, a lack of self-confidence, loneliness, depression, emotional instability and social anxiety (Guo et al., 2016; Zhao et al., 2008). Moreover, an increasing number of young people are being orphaned due to high rates of mortality from poor health conditions such as immunodeficiency virus/AIDS, tuberculosis, malaria and natural disasters across African and Asian countries (Thielman et al., 2012).

Another related risk factor pertains to youth experiences of war conflict and violence in LMICs. The risk of internalised difficulties was found to be 7.1 times higher in children and adolescents experiencing war-related violence (Sapmaz et al., 2017). Since 2010, LMICs have witnessed a dramatic increase in fragility, conflict and violence (The World Bank Group, 2019). The deleterious effects of living under armed conflict are profound for children and adolescents (Benjet, 2010; Kadir et al., 2019). Children who are exposed either directly or indirectly to armed conflict suffer psychological harm that persists across their life course and beyond, and even to subsequent generations born after the conflict has ended (Fazel et al., 2012; Reed et al., 2012). A recent systematic review found a prevalence rate of up to 87% for symptoms of PTSD among youth exposed to traumatic experiences in LMICs compared to 8% in HICs (Lewis et al., 2019; Merikangas et al., 2010). Poverty is another important risk factor, as a substantial proportion of the populations of LMICs live below the poverty line (The World Bank Group, 2017). Poverty extends into all areas of young people's lives and prevents children from having the security and structures required to grow, thrive, and develop (Foster, 2000; Foster & Williamson, 2000; Nyambedha et al., 2003; UNICEF, 2004). Poverty is strongly associated with emotional problems (Lund et al., 2010). This relationship is multi-layered, with overlapping factors such as malnutrition, poor physical health, higher

mortality rates, and crime, which substantially increase the risk of mental illness (Lund et al., 2010; Patel et al., 2007). This is compounded by the fact that poverty often reduces access to care and availability of treatment services, which in turn creates a perpetuating cycle of mental illness (Van't Hof et al., 2011). Studies across Brazil, India and Zimbabwe have shown that rates of emotional problems are about twice as high in lower-income than higher-income groups, supporting the notion that poverty and other adverse social determinants are high risk factors for emotional problems such as anxiety and depression (Patel et al., 1999).

Child maltreatment in LMICs is also an important risk factor, with associated pathways involving poverty, caregiver mental health distress, HIV/AIDS and sociocultural variations in family structures and attitudes (Meinck et al., 2014). Such adverse childhood experiences (ACEs; a constellation of exposures including abuse, neglect, and household challenges) are linked to negative long-term effects of childhood trauma with poorer health across the life course (Blum et al., 2019; Calam, 2017). ACE increases the risk of anxiety and depression 4.5-fold and suicide attempts 12.2-fold (Pearn, 2003); however, the restricted social milieu allows these figures to often go unnoticed (Gangrade et al., 1995). Cultural and social structures including gender and age inequalities not only predispose individuals to being victims of abuse but also make it difficult for victims to respond safely to the abuse. Cultural norms across some LMICs dictate and restrict children behaviours, making it easier for the adults to take advantage of children and making it difficult for children to seek help (Ramírez et al., 2011; Smith et al., 2010). An important finding by Ward et al. (2001) suggests that anxiety symptoms are more prevalent in young people when the experience of violence is perpetrated in the home or by someone known to the child, while depressive symptoms are more prevalent when the child is a victim or witness of violence by a stranger or unknown person. These risk factors for child and adolescent emotional problems may work together over time (Boyce, Frank, Jensen et al., 1998; Bronfenbrenner & Morris, 1998;

Cicchetti & Toth, 1998; Essex, Kraemer, Armstrong et al., 2006; Goodman & Gotlib, 1999).

Hence, further research is required for addressing the coverage of risk factors of emotional problems during the developmental periods of childhood and adolescence in LMICs.

The results of this systematic review further indicate that both overall and specific anxiety symptoms are more prevalent among young females than young males. Young females also reported more depressive symptoms than young males. Interestingly, however, comorbid emotional problems were higher for young boys than young girls. The findings are consistent with research showing gender differences in rates of depression and anxiety symptoms with adults, where women are more likely to experience these emotional difficulties than men (Bor et al., 2014; Kessler et al., 1994; Steel et al., 2014; Zahn-Waxler et al., 2008). Gender differences in adolescent experiences of depression and anxiety-related problems may also increase with age (Torsheim et al., 2006) and through reinforced experiences of violence (Ward et al., 2001). Moreover, a large number of participants included in the review were recruited from schools, so education-related worries, as well as psychological pressures on weight and appearance, may be combined to create increasing pressures on adolescent girls (West & Sweeting, 2003). Girls may be more negatively influenced by school performance pressure, with one study reporting that two-thirds of girls experienced significant school pressure compared to only one-third of boys (Wiklund et al., 2012).

Recent generations of girls are exposed to earlier sexualisation, which has been associated with poor self-esteem and depressed mood (American Psychological Association, 2010), Hatch, 2011; Reist, 2009; Sweeting et al., 2007). Moreover, other societal changes negatively affect women, such as changing media and consumer culture (Hamilton, 2008), and changing nature of transitions and cultural expectations for adolescent girls (Eckersley, 2008). Hankin et al. (2008) suggest that girls are more socio-emotionally attentive than boys,

where negative cognitive style and rumination can interact to predispose girls to anxiety and depression symptomology. Research also suggests that the current generation of girls may be experiencing the onset of puberty earlier than previous generations (Euling et al., 2008), which may be associated with an increased risk of internalising problems such as anxiety and depression (Crockett et al., 2013; Galvao et al., 2014; Patton et al., 2008).

Furthermore, the review also indicates a gender difference in comorbid emotional problems being more prevalent among boys than girls. Indeed, gender differences in early onset of anxiety and depression symptoms appear to be more common in males than females (Christiansen, 2015). Population-based estimates indicate that a significant number of males suffer from mental health problems, and that the gender gap is narrowing (Kessler, McGonagle, Zhao et al., 1994, Kessler, Chiu, Demler et al., 2005; Stoolmiller, Kim, & Capaldi, 2005). This gender gap in emotional problems may be partly attributable to differences in socialisation processes and gender-roles that are intensified from childhood and adolescence, and activate concepts of masculinity and femininity (Parker & Brotchie, 2004). Firstly, identification with a masculine gender-role may cause a person to underreport anxiety symptoms (Bekker & van Mens-Verhulst, 2007; Pierce & Kirkpatrick, 1992), resulting in a reporting bias. Some support for an underreporting of fear and anxiety in males has been found in a study that reported an increase in fear reports in males, but not in females, when their physiological fear reactions were being monitored and participants believed that lying would be detected (Pierce & Kirkpatrick, 1992). Secondly, socialisation processes may exacerbate gender differences in levels of emotional problems. From childhood, males are generally encouraged to confront feared objects, resulting in a greater exposure and extinction of fear responses in males compared to females, for whom avoidance and fearful behaviour is less likely to be dissuaded (McLean & Anderson, 2009). Hence, males and females are exposed to different types of social and environmental stressors, which is likely

to affect their susceptibility to emotional problems such as anxiety and depression. However, further research is required to address potential causes of increased emotional problems in child and adolescent boys and girls – it is possible that factors such as these all contribute to the risk of mental health symptoms.

3.6. Limitations

This systematic review indicates significant variability in reported prevalence estimates of anxiety, depression and comorbid emotional problems among children and adolescents across 20 LMICs. The review displayed some heterogeneity of studies. It is unclear whether the heterogeneity of frequency of emotional problems between studies reflects true differences or reflects influences of other factors. Despite the fact that studies used reliable psychometric tools, there was variability in assessment such that some studies relied on clinical interviews based on DSM or ICD diagnostic criteria, whereas others used self- or parent-reported rating scales. Moreover, the transferability of western assessment measures to non-western societies should be treated with caution, as biases may still occur in relation to cross-cultural understanding, interpretation and translation (Bronstein & Montgomery, 2011). The review's studies included data from children from a broad age band (as young as 1 year and up to 20 years) as recommended by WHO (2017). It is arguable that given that higher rates of emotional problems are reported in older adolescents (Nair et al., 2004), who experience rapid transition into adulthood accompanied by several potentially stressful life events, it is also possible that the transition from childhood to adolescence within different cultural milieus might influence the prevalence of estimates of emotional problems. Indeed, higher prevalence of emotional problems were reported among 5- to 10-year olds in Bangladesh (Mullick & Goodman, 2005) and among 11- to 14-year olds in Brazil (Fleitlich-Bilyk & Goodman, 2004).

3.7. Conclusion

Results from the systematic review indicate that emotional problems in LMICs are notable among children and adolescents. Reported prevalence estimates for anxiety and depression varied wildly among LMICs but were either comparable or higher than the reported rates in HICs. Perhaps reflective of this, the majority of children and adolescents in the LMICs might have been exposed to several risk factors, such as parental migration, conflict and violence, and poverty. Gender differences have also been found across specific and comorbid emotional problems. Prevalence estimates were derived from across 20 LMICs, and the variability in estimates is largely explained by study methods, assessment procedures, and case definition. Nevertheless, these results are essential to service, training, and research planning in LMICs and must be used in a manner that will promote sound and sustainable anxiety and depression prevention programmes for young people in LMICs. It would be useful to the field to further explore the prevalence of emotional problems among children and adolescents in an LMIC country where such data are not available.

3.8. Summary

This systematic review attempted to decrease the knowledge gap of emotional problems faced by young people in LMICs. Evidence suggests a high prevalence of youth emotional problems in LMICs. During the process of data collection for the review, it was noticeable that no available research data existed for youth emotional problems or any other associated mental health research in children/adolescent population of LMIC of Mauritius, despite Mauritius being one of the ten major countries for child exploitation throughout Africa. Hence, the next study (Study 2; Chapter 5) sought to investigate the prevalence of

emotional problems in an unresearched culture among young Mauritians. It also aimed to explore the risk factors associated with emotional problems.

Chapter 4: Study 2:

Prevalence of emotional problems among adolescents in the Low-Middle-Income Country of Mauritius

4. Overview

The systematic review in Study 1 indicated a high prevalence of emotional problems among young people in LMICs. Interestingly, the review did not reveal any studies on youth emotional problems in the LMIC of Mauritius, despite the alarming mental health needs of the Mauritian population (WHO, 2020). This study will demonstrate why Mauritius is also an important LMIC to specifically focus on youth mental health research. It is important to establish prevalence rates to inform the prevention or treatment of emotional difficulties in young Mauritians. Hence, building on the systematic review chapter, this study will specifically aim to assess the overall prevalence of emotional problems among adolescents in Mauritius. The roles of both gender and age in adolescent emotional problems will also be assessed. This chapter will then go on to explore the relationship between the risk factors of sleep quality, lifestyle and habits and cognitive emotion regulation strategies with emotional problems in Mauritian adolescents.

4.1. Introduction

The fact that adolescents in LMICs are continuously faced with extensive unmet psychological, health and social care needs is worrisome (UNICEF, 2016). Emotional problems have a significant adverse impact on adolescents, as well as their families, particularly in relation to their quality of life and psychological wellbeing. Significant gaps remain in the provision of mental healthcare services for adolescents in LMICs (Petersen et

al., 2012). The importance of addressing these gaps is highlighted by findings that 50% of mental health disorders in adults have their onset before the age of 11 (Kessler et al., 2005; Merikangas et al., 2010). The systematic review of prevalence of emotional problems among young people in LMICs (Chapter 3) evidenced a prevalence rate of emotional problems up to 41%, anxiety up to 30%, and depression up to 58%. These estimates are alarming, creating an urgent need to address potential risk factors leading to increased emotional problems in adolescents. In turn, research findings on the risk factors of emotional problems will contribute to the setting up of adequate wellbeing programmes while aiming to diminish the consequences of emotional problems on later development and functioning.

4.2. Mauritius & Emotional Problems

Mauritius is a tropical island nation located in the South West part of the Indian Ocean. It has a land surface area of 2,040 square kilometres and a population of approximately 1.3 million. The island had no human settlement before the arrival of the European colonisers. During the French and British colonization period, migration from various parts of Africa and Asia led Mauritius to become a multi-ethnic, multi-religious, and multi-lingual society. Mauritius is like a world in itself, and it is often described as a “rainbow nation” (Ramtohul, 2015), a multicultural mosaic (Eriksen, 1994) and a ‘Creole Island’, hybrid and mixed (Benoist, 1985). Within the context of a rapidly emerging globalised economy and society, Mauritius is viewed by researchers as an ideal place for a psychosocial laboratory to study the diversity of populations and practices based on different religions, cultures and traditions (Eriksen, 1998). Unfortunately, youth emotional problems in Mauritius remain under-prioritised despite evidence of severe life-long mental health challenges (Kieling et al., 2011), similar to other LMICs. Geographically isolated but globally connected, the island of Mauritius therefore provides a unique multicultural and

multi-ethnic setting to study the epidemiology and challenges of emotional problems among adolescents.

However, relative to other LMICs, the capacity for mental health research in Mauritius is disproportionately lower than that of other areas of research. Mauritius has a poor level of mental health research, which is often an underrated and even neglected area of activity. Many LMICs, including 15 of 19 African countries, allocate less than 1% of their health budgets to addressing mental illness. Mauritius spends approximately 2% of the GDP on health with government expenditure per capita on mental health being less than 4 Mauritian rupees, which works out to be less than 0.01% of the health GDP on mental health (Musango, 2020). No clear data is available on the budget allocation for youth mental health in Mauritius, for instance, no mention of youth mental health has been made in the recent financial budget 2021 of Mauritius (Budget Speech 2021-2022). The WHO representative in Mauritius highlighted the urgency in investing in mental health in Mauritius (Musango, 2020). Arguably, a lack of adequate funding in mental health may invariably relate to a lack of awareness about mental health among mental health professionals and stakeholders. Lack of mental health literacy is often associated with high level of stigmatisation (Zhou et al., 2020), which in turn can prevent people from seeking adequate help from health services, and this can cause increasingly debilitating emotional problems (Rathod et al., 2017).

Among the population of 1.3 million, 22% of adult Mauritians are estimated to suffer from mental health problems (WHO, 2000). Furthermore, Mauritius has the highest suicide rate in Africa and a low rate of mental health specialists (approximately 1 psychiatrist and 1 psychologist per 100,000 of population) (WHO, 2005). One in every five adult Mauritian is affected by psychological or psychiatric problems with little or no access to mental health services. These findings among adults suggest a high level of unmet needs for the treatment of emotional problems in Mauritius. The prevalence of emotional problems among

adolescents in Mauritius is unknown. Studying the Mauritian youth population is particularly important given the plethora of research indicating the long-term impact of emotional problems in current adolescent life and later adult life. The epidemiological approach adopted in this study will allow variables from different psychosocial aspects of a child to be examined and enable a more holistic understanding of the risk factors that can contribute to emotional problems. The knowledge and data from the study will also help with identifying and adapting preventative intervention programmes for emotional problems among adolescents in Mauritius (covered in Chapter 6; Study 3).

4.3. Risk Factors of Emotional Problems

In the aetiology of emotional problems, there is a complex interplay between different interacting systems that include the child's individual characteristics (e.g. age, gender, temperament, cognitive abilities) and external systems (e.g. family and peer relations, community or environmental factors) (Karevold, Roysamb, Ystrom et al., 2009; Mian, Wainwright, Briggs-Gowan et al., 2011; Rapee, Schniering, & Hudson, 2009). For the purpose of this study, emphasis will be laid on the internal risk factors of emotional problems. Emotional problems have been associated with a range of difficulties that negatively affect mental health, physical health and everyday life for youths (e.g., impaired self-worth, lack of joy, disrupted appetite and sleep patterns), including increased risk of self-harm and suicide (Schulte-Körne, 2016). Risk factors make adolescents more susceptible to debilitating emotional difficulties.

4.3.1. Gender

Empirical research has established that gender differences exist for emotional problems in general. A systematic review by Bor et al. (2014), over a ten-year period across

three different cultural contexts, demonstrated that the severity of emotional problems is dependent on multiple factors such as gender, developmental phase, and type of symptom being experienced. Over the years, girls seem to demonstrate increases in internalising symptoms, whereas mixed findings were found for boys. Across different countries and varying contexts, specific depression, anxiety, and psychological distress affect girls to a greater extent than boys (Wiklund, Malmgren-Olsson, Öhman et al., 2012; WHO, 2001). In this regard, several other studies have indicated an increase in emotional problems over time for girls but not necessarily for boys (Fink, Patalay, Sharpe et al., 2015; Torikka, Kaltiala-Heino, Rimpela et al., 2014; Van Droogenbroek, Spruyt, & Keppens, 2018). Boys have reported less symptoms of anxiety and depression than girls (Van Droogenbroek et al., 2018; Van Voorhees, Paunesku, Kuwabara et al., 2008; Wiklund et al., 2012). Moreover, research suggests that compared with males, females not only report more anxiety and depression, but also have higher comorbidity over time (Carmassi, Bertelloni, Salarpi et al., 2018; Jin, Deng, An et al., 2018; Wang, Fu, Wu et al., 2012). However, other studies have found no differences in females' and males' reports of anxiety, depression, and comorbid symptoms (Cheng, Ma, Yang et al., 2015; Liu, Wang, Shi et al., 2011).

The causes of gender differences in emotional problems among young people are not fully understood. However, it is argued that boys often deny their emotional problems and tend to mask their emotional difficulties through externalised behaviours (Patel, Flisher, Hetrick et al., 2007). While girls, experiencing negative mood and anxiety, are more instinctive in being expressive of their depressive and anxiety symptoms (Dell'Osso, Carmassi, Massimetti et al., 2011). The gender differences in emotional problems may relate to societies' influence of gender-specific stressors in relation to gender conceptions and the socially defined roles of males and females. For instance, girls are often assumed to be more emotionally sensitive (Rosenfield & Mouzon, 2013) and ruminate more as a coping strategy

(Nolen-Hoeksema, Larson, & Grayson, 1999). They are also expected to experience increased suffering from stressors (Matud, 2004), particularly when related to restricted gender roles and body dissatisfaction (Haugen, Johansen, & Ommundsen, 2014), increased family violence, abuse, and school performance pressure (Wiklund et al., 2012). All of these factors have been associated with a greater likelihood of sustained emotional problems. For these reasons, gender differences are examined in the current study.

4.3.2. Age

The role of gender in emotional problems may be associated with age (Bokszczanin, 2007), given that cognitive ability varies by age (Liu et al., 2011). Studies indicate that emotional problems intensify with increasing age, especially during adolescent years (Durbeej, Sorman, Selinus et al., 2019; Ellsperger & Nikolas, 2017; Torsheim, Ravens-Sieberer, & Hetland, 2006). As discussed in Chapter 2, there is persuasive evidence that anxiety has an early onset in childhood (Beesdo, Pine, Lieb et al., 2010), followed by depression (Paus, Keshavan, & Giedd, 2008), than other forms of psychopathology. Longitudinal epidemiological studies suggest that both gender and age play a significant role in emotional problems. Gender differences begin to emerge in early adolescence (ages 13 to 15) and continue to increase into late adolescence (ages 16 to 19) (Angold & Rutter, 1992). Moreover, by age 11 both genders display depressive symptoms, but by ages 14 to 16, girls are twice as likely to suffer from depression than boys (Hankin, Abramson, Moffitt et al., 1998). On the other hand, depressive symptoms were found to increase across a four-year period, from when boys and girls were 12 to 13 years to 16 to 17 years (Galambos, Leadbeater, & Barker, 2004). A study with a large sample of adolescents aged 15 to 16 indicated that girls reported not only rising levels of emotional problems during adolescence,

but they also demonstrated successive increases in psychosomatic health problems (Hagquist, 2009).

4.3.3. Lifestyle and Habits

A healthy lifestyle is associated with enhanced emotional wellbeing (Khazaeian, Kariman, Ebadi et al., 2018; Pillai, Patel, Cardozo et al., 2008). For instance, good eating habits and dietary intake, physical activity, and exercise, have positive effects in terms of preventing emotional problems (Carek, Laibstain, & Carek, 2011; Jacka, Kremer, Leslie et al., 2010; Roohafze, Sadeghi, Shirani et al., 2009). A recent study in Mauritius explored the dietary intake, fruit, vegetable and energy intake and lifestyle behaviours among Mauritian children aged 6 to 12 (Bundhun, Rampadarath, Puchooa et al., 2018). It was found that children consumed less nutritious foods, had low physical activity levels, were exposed to media for longer periods of time and they regularly consumed fast food. The results highlighted the need for improving the habits and quality of life of Mauritian children.

In recent years, processed foods have become more available and popular among children and adolescents relative to traditional food alternatives. Research reports associations between quality of nutrition and mental health outcomes (Oddy, Robinson, Ambrosini et al., 2009; Oellingrath, Svendsen, & Hestetun, 2014). Modernized foods such as a high intake of snacks and animal-based foods have been found to be associated with emotional problems, while a high intake of traditional foods has been associated with a decreased likelihood of emotional problems (Weng, Hao, Qian et al., 2012). Moreover, both high-nutrient and poor-nutrient foods are related to an increase in the likelihood of adolescents displaying emotional problems (Jacka et al., 2010; Oddy et al., 2009), and healthy dietary and nutrition patterns improve mental health (Khalid, Williams, & Reynolds, 2016).

Together, anxiety and depression can also significantly impact physical health. Experiencing internalizing problems may be stressful for youth and, in turn, these problems then contribute to poorer physical health outcomes such as problematic eating behaviours (Chardon, Janicke, Carmody et al., 2016), low physical activities (Zach, Zeev, Dunsky et al., 2013), absenteeism (Kearney, 2008) and fluctuations in Body Mass Index (BMI) (Brook, Zhang, Saar et al., 2009). A longitudinal study (Jamnik & DiLalla, 2019) found that increased internalising problems were related to heightened health problems at different time points from childhood and adolescence. Emotional problems in early childhood (age 5) predicted increased overeating and health problems by adolescence. Moreover, at follow-up between the ages of 12 and 20, these same adolescents reported increased internalizing issues which were positively related to health problems and negatively related to physical activity behaviours. A gender effect also emerged, with girls reporting higher emotional and health problems at follow-up.

Adolescent emotional problems and its association with substance use is also a complicated mental health hazard. For example, adolescents with high levels of anxiety and depression may engage in more substance use (e.g. alcohol and/or drugs) as a way of coping with their anxious/depressed feelings and symptoms (Comeau, Stewart, & Loba, 2001; Ohannessian, 2014; Rudolph, Flynn, & Abaied, 2008). Moreover, research indicates that youth with emotional problems often try to alleviate interpersonal problems through participating in substance use with peers. While adolescents with more depressive symptoms seem to have more friends who smoke, drink alcohol, and use marijuana (Siennick, Widdowson, Woessner et al., 2016). On the other hand, positive peer networks, that is, a protective set of close friends who are engaged in prosocial activities and who provide instrumental and emotional support, seem to provide a buffering effect against depression and substance use (Fredricks & Eccles, 2008). Hence, risk factors such as a negative lifestyle and

substance use, and protective factors such as peer or familial support, can either negatively or positively affect a child's developmental trajectory and thus increase or decrease the risk of emotional problems and substance use disorders in later adolescence and early adulthood (Scott, Wallander, & Cameron, 2015).

4.3.4. Sleep

A significant proportion of youth with elevated levels of emotional problems experience sleep problems (Ivanenko, Barnes, Crabtree et al., 2004; Johnson, Chilcoat, & Breslau, 2000; Morrison, McGee, & Stanton, 1992). Optimal sleep quantity and quality is essential for adolescent emotional wellbeing and proper functioning (Hirshkowitz, Whiton, Albert et al., 2015; Ohayon, Wickwire, Hirshkowitz et al., 2017). According to recommendations from the American Academy of Sleep Medicine (AASM), adolescents less than 18 years old should sleep 8 to 10 hours per 24-hour period on a daily basis to promote optimal health (Paruthi, Brooks, D'Ambrosio et al., 2016). However, 30% to 50% of adolescents sleep less than this recommended sleep time (Kosticova, Geckova, Dobiasova et al., 2019) and 10% to 20% of young people experience sleep difficulties, as manifested in difficulties falling asleep (De Zambotti, Goldstone, Colrain et al., 2018; Thumann, Bornhorst, Michels et al., 2019; Verkooijen, de Vos, Bakker-Camu et al., 2018).

Evidence suggests that the indicators of good sleep quality in adolescence not only includes 8 to 10 hours of daily sleep, but also sleep onset latency of less than 30 minutes and maximum awakening of no more than 5 minutes per night (Ohayon et al., 2017). However, recent studies are noting an increasing trend of sleep difficulties with a consistent decline in sleep duration across adolescence (Matricciani, 2013; Norell-Clarke & Hagquist, 2017; Keyes, Maslowky, Hamilton et al., 2015). Such sleep disturbances over time will contribute to problems in emotional regulation and increase the risk of psychopathology (Sadeh,

Tikotzky, & Kahn, 2014; Schmidt & der Linden, 2015). Indeed, sleep problems have been evidenced in specific emotional problems of anxiety and depression (Bauducco, Flink, Jansson-Frojmark et al., 2016; Ojio, Nishida, Shimodera et al., 2016; Silvertsen, Harvey, Pallesen et al., 2015). Poor sleep not only disrupts the emotional realm of youth, but also impacts their cognitions and behaviours by increasing risk-taking behaviours, aggression, suicidality and poor academic performance (Hirshkowitz et al., 2015; Owens, 2014; Sadeh et al., 2014).

Risk of developing anxiety and/or depression is significantly higher in discreet age groups of children and adolescents (Verkooijen et al., 2018). For instance, the presence of sleep problems in childhood (age 4 to 6) has significantly predicted internalising anxiety and depressive symptoms in adolescents (age 11 to 15) (Johnson et al., 2000; Gregory & O'Connor, 2002). These data indicate important longitudinal links between poor sleep in childhood and the later development of emotional problems. More specifically, sleep problems in early childhood have been found to be more closely linked to anxiety, whereas sleep problems in adolescence are more closely associated with depression (Alfano et al., 2009). Conversely, anxiety and depression appear to be stronger predictors of sleep disturbances in children and adolescents, hence suggesting that the above associations might be causal and bidirectional.

4.3.5. Cognitive Emotion Regulation

Cognitive emotion regulation, which plays a major role in emotional problems, is understood as the process or activities by which individuals can track, evaluate, and influence the nature, course and expression of emotions (Gross, 1998; Nolen-Hoeksema, 2012). A recent meta-analysis of 212 studies provided a clear base of evidence for the association of emotion regulation with symptoms of internalising psychopathology among adolescents

(Compas, Jaser, Bettis et al., 2017). Arguably, young people who repeatedly fail to regulate their emotions in accordance to the demanding situation, are at greater risk of developing internalising problems of anxiety and depression (Barlow, Allen, & Choate, 2004). When adolescents perceive a situation as uncontrollable and/or a strong unwanted feeling occurs, this leads the person to initiate emotion regulation efforts. If the emotion regulation that occurred remains ineffective, this creates an increase in the unwanted feelings, which may then lead the person again into a negative cycle with increasing psychological distress and poor attempts at emotion regulation. This repeated cycle of failure to downregulate unwanted feelings through poor emotional regulation skills leads to an increased risk of anxiety and depression in adolescence (Feng, Keenan, Hipwell et al., 2009; Kim-Spoon, Cicchetti, & Rogosch, 2013; Schneider, Arch, Landy et al., 2018).

Children with anxiety problems have reported more emotion dysregulation compared to a control group of non-anxious children (Suveg & Zeman, 2004). Likewise, both children and adolescents with depression have also reported the use of less effective emotion regulation strategies (Siener & Kerns, 2012). In a non-clinical sample of children and adolescents, a lack of positive strategies to regulate emotions, as well as the presence of negative emotion regulation strategies, were associated with both anxious and depressive symptoms (Lovaas, Sund, Patras et al., 2018). Indeed, a meta-analysis of 114 studies confirmed that maladaptive strategies seem to be more strongly and consistently connected to internalised psychopathology than adaptive strategies, and that anxiety- and depressive-related problems are more strongly connected to emotion regulation strategies than other mental health problems (Aldao et al., 2010).

4.3.6. School Settings

As discussed in Chapter Two, the period of adolescence is a critical phase for development of emotional problems, hence, schools seem to be a natural setting to support the accumulation of both positive and negative experiences. The school environment forms part of the child's broader environment. Schools can serve as protective factors, moderate the effects of internalising problems and promote mental health (Osher, Dwyer, Jimerson et al., 2012; Suldo, Gormley, & DuPaul, 2014; Weist & Murray, 2008). However, young people may often experience anxiety and depression symptoms in school settings due to experiences of demands for skills they may not have and/or due to unsuccessful interactions with peers (Stormont, Herman, & Reinke, 2015). Psychosocial maladjustment in schools may make students more anxious, depressed and lonely and it may lead to severe emotional problems (Sourander, Helstela, Helenius et al., 2000). Adolescents with internalising problems have been found to exhibit relatively high frequencies of emotional symptoms, with these same individuals being more physically inactive and having poorer self-assessed health than others (Laukkanen, Shemeikka, Notkola et al., 2002).

Moreover, both symptoms of anxiety and depression may negatively impact school performance and academic achievement (Pedersen, Hoen, Lydersen et al., 2019). For instance, youth with anxiety withdraw from school prematurely compared to their peers, stating that they feel too nervous in school, feel uncomfortable leaving home, or feel intimidated by teachers and peers (Van Ameringen, Mancini & Farvolden, 2003). Depression, on the other hand, manifests in poor academic achievement, secondary to school phobia and behavioural problems (James-Palmer, Anderson, Zucker et al., 2020; Pedersen et al., 2019). Overall, associations between school functioning and levels of internalizing symptoms have been documented bidirectionally in both cross-sectional and longitudinal

studies (Duchesne, Vitaro, Larose et al., 2008; Gustafsson, Allodi, Westling et al., 2010; Riglin, Petrides, Frederickson et al., 2014).

4.4. The Present Study

The above findings draw on emotional problems research carried out across HICs and LMICs, along with research into the possible risk factors of emotional problems of anxiety and depression. To the best of knowledge, however, there is no research available on emotional problems prevalence, nor an understanding of associated risk factors among adolescents in the low- and middle-income island of Mauritius. This is therefore one of the first studies on emotional problems such as anxiety and depression, and associated risk factors, in Mauritius.

4.4.1. Identifying Adolescents At Risk

Brief, low-cost screening instruments, like the Strengths and Difficulties Questionnaire (SDQ), may help identify young people at risk of mental health issues and help build a national database of youth mental health needs (Sharan & Sagar, 2008). High reliability for the SDQ measure has been demonstrated in a study conducted in five LMICs in Southeast Asia and sub-Saharan Africa (Escueta, Whettern, Ostermann et al., 2014). According to many studies conducted globally, the total difficulties score of the SDQ is reported to be a psychometrically comprehensive measure of overall emotional problems in adolescents (DeVries et al., 2018; Goodman, Lamping, & Ploubidis, 2010). The distributions of raw scores obtained in the SDQ measure may serve as a basis for determining recommended bandings and defining cut-offs to identify a range of normal, borderline and clinical scores among Mauritian adolescents. The original UK cut-off points were derived by classifying approximately 10% of the normative sample with the most extreme scores in the

“abnormal” banding, the next 10% in the “borderline” banding and the remaining 80% in the “normal” banding categories. Likewise, percentile bandings of SDQ scores above the 90th percentile are classified as abnormal, those in the 80th to 90th percentile range as ‘borderline’, and those below the 80th percentile as ‘normal’ (Goodman, 1997).

Goodman et al. (1998, 2000) originally suggested that the cut-offs of the SDQ could act as useful “warning signals” that the adolescent might have a mental health disorder. The use of UK cut-off scores may not always be suitable when the SDQ is used in different countries and contexts (Goodman, 1997). Hence, to avoid overestimation of prevalence in LMICs (Goodman, Heiervang, Fleitlich, Alyahri et al., 2012), specific cut-off norms should be adjusted across different cultures and different samples (Crinjen, Achenbach, & Verhulst, 1997; Goodman et al., 1998). Revised cut-off values have been calculated for a number of countries, including China (Du et al., 2008), India (Bhola et al., 2016) and the Democratic Republic of Congo (Kashala et al., 2005). Hence, in accordance with the percentile thresholds and the UK original cut-off points (Goodman, 1997), cut-off scores are also examined for the Mauritian sample in this study.

4.5. Research Aims

Firstly, this study aims to explore the prevalence of emotional problems in a sample of Mauritian adolescents. Secondly, this research aims to examine potential risk factors which can predict emotional problems. This research provides an original contribution to knowledge by examining emotional problems such as anxiety and depression in a previously unresearched culture. Furthermore, this study will advance understanding by providing new insights into the range of risks associated with emotional problems of anxiety and depression that have not yet been explored among adolescents in Mauritius. This knowledge will thus allow a greater understanding of prevalence of emotional problems and assist in the

identification of those most clearly at risk of emotional difficulties. It will also eventually help assess the adaptation of the CBT-based intervention programme, SSL.

The research questions for the current study are as follows:

1. What is the prevalence of overall emotional problems among adolescents in Mauritius?
2. What cut-off points should be recommended based on the study sample in Mauritius?
3. Are there gender or age differences on emotional problems among adolescents?
4. Is there any relationship between sleep quality, lifestyle and cognitive emotion regulation and emotional problems among adolescents?

4.6. Method

4.6.1. Participants

Participants were 818 adolescents (434 [53.1%] females and 384 [46.9%] males) recruited via an opportunity sample from six secondary schools across Mauritius. The mean age of the sample was 13.60 ($SD = 1.49$), with participants ranging from 12 to 17 years of age. Four of the schools were public (state schools) and two of the schools were private (government-aided schools). 99.3% of participants recorded their nationality as Mauritians while four participants identified as Indians and two participants identified as Europeans. The sample was representative of the ethnic backgrounds of the Mauritian population (primarily Hindu, Creole and Muslim). These ethnic groups are also identified as religious groups in Mauritius. For further participant details, see Table 3.

The sample was divided into two age groups: a lower age group of 12-14 years and a higher age group of 15-17 years. This division was made according to the education system

of lower secondary (12-14 years) and upper secondary education (15-17 years). Older children of 11 years from primary schools make the transition to secondary schools at the age of 12 years. At the age of 15 years, they go through the transition into different classes in relation to their chosen subjects for upper secondary education. Therefore, the fact that young adolescents make an early school transition at the age of 12, and then again these adolescents change their social environment at the age of 15 years, was seen as an appropriate reason for dividing the sample into these two age groups. The mean age of the lower age group (12-14 years; $n = 610$) was 12.87 ($SD = .81$) while that of the higher age group (15-17 years; $n = 208$) was 15.75 ($SD = .82$).

Table 3.

Participant demographics in Study 2 (N = 818)

	Girls <i>n</i> (%)	Boys <i>n</i> (%)	Girls & Boys <i>n</i> (%)
	(<i>n</i> = 434)	(<i>n</i> = 384)	(<i>n</i> = 818)
Age groups			
12 – 14 years	334 (40.9%)	100 (12.2%)	434 (53.1%)
15 – 17 years	276 (33.7%)	108 (13.2%)	384 (64.9%)
Nationality			
Mauritians	431 (52.7%)	381 (46.6%)	812 (99.3%)
Indians	3 (0.4%)	1 (0.1%)	4 (0.5%)
Europeans	2 (0.2%)	-	2 (0.2%)
Ethnicity			
Hindu	217 (26.5%)	184 (22.5%)	401 (49.0%)
Creole	98 (12.0%)	108 (13.2%)	206 (25.2%)
Muslim	72 (8.8%)	68 (8.3%)	140 (17.1%)
Chinese	36 (4.4%)	20 (2.4%)	56 (6.8%)
European	11 (1.3%)	4 (0.5%)	15 (1.8%)

Schools			
State	303 (37.0%)	260 (31.8%)	563 (68.8%)
Government-aided	131 (16.0%)	124 (15.2%)	255 (31.2%)
Districts			
West	69 (8.4%)	79 (9.7%)	148 (18.1%)
East	84 (10.3%)	72 (8.8%)	156 (19.1%)
South	61 (7.5%)	55 (6.7%)	116 (14.2%)
North	77 (9.4%)	55 (6.7%)	132 (16.1%)
Central A	67 (8.2%)	57 (7.0%)	124 (15.2%)
Central B	76 (9.3%)	66 (8.1%)	142 (17.4%)

4.6.2. Recruitment and Procedure

After ethical approval for the present study was received from the University of Roehampton (Appendix 1), the 3 school directorates, who manage all secondary schools in Mauritius, were invited to participate in this study (see Appendix 4). Two school directorates gave their approval for their participation in this study (see Appendices 5 and 6) while the other school directorate declined the offer with reasons related to mental health stigma. Mauritius is comprised of nine districts and study approval was received for one school in six different districts, three being in a rural area and three in an urban area. Following study approval in April 2019, meetings were held with the school rectors to discuss details of the study. Testing times during day lessons at schools were specified and opt-out letters for parental consent (see Appendix 7) were sent out to parents one week prior to planned testing. Parents were informed that they could withdraw their child from the study at any time (this was made clear in the opt-out consent letter) by contacting the researcher and asking for the child's data to be removed (though it was noted that data may still be used in a collated form).

Secondary Education in Mauritius is a 7-year cycle from grade 7 to grade 13. Students from grade 7 to grade 12 were approached for this study while grade 13 was not recruited given that most of these students are aged 18 and above. Furthermore, grade 13 students aged below 18 were mostly absent from schools for exams revision during the research period. From each school, one class from grade 7 to grade 12 was selected (random selection was made if there was more than one class per grade level); a total of 42 classrooms were selected for this study. Each class had a capacity of approximately 20 to 30 students. Students who had parental consent to opt-out of the study did not take part in this study.

Data collection took place in May 2019 with an 82% response rate. The questionnaires were administered by the researcher to allow independent answering of the questionnaires, and to answer any questions that the students may have had. The questionnaires were answered anonymously and upon completion of the questionnaire, participants were given a debrief letter with information regarding withdrawal from the study and contact details of support services for any concerns or feelings of distress. The entire procedure involved a single session lasting 45 minutes. Participants were verbally debriefed following the completion of the questionnaires and they were also given a debriefing form with details (see Appendix 8).

4.6.3. Measures

All the measures used in the present study were standardised instruments in the English language. Cronbach's alpha values for each scale have been reported below to show the internal consistencies of these measures.

4.6.3.1. Emotional and behavioural difficulties and positive attributes

The *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997), comprising 25 items plus impact supplement, measured children's general difficulties and positive attributes: emotional symptoms ($\alpha = .70$), conduct problems ($\alpha = .44$), hyperactivity ($\alpha = .43$), peer problems ($\alpha = .38$), and prosocial behaviour ($\alpha = .61$) (see Appendix 9). Each item was rated on a 3-point scale, ranging from 0 (*not true*) to 2 (*certainly true*); higher scores indicate greater difficulties or problem behaviours. Subscales are also combined to measure overall internalising behaviours, ($\alpha = .74$), overall externalising behaviours ($\alpha = .66$), total difficulties ($\alpha = .73$) and the total impact of these difficulties on their everyday lives ($\alpha = .88$). The SDQ has been found to have good psychometric properties in a variety of cultures and languages (Hoosen, Davids, de Vries et al., 2018; Husky, Otten, Boyd et al., 2018).

The SDQ subscales and total difficulties score generated from conduct problems, hyperactivity, emotional symptoms and peer relationship problems, are divided into a three-band categorisation of normal, borderline and abnormal scoring system of symptoms. Percentile bandings of SDQ scores above the 90th percentile are classified as abnormal, those in the 80th to 90th percentile range as 'borderline', and those below the 80th percentile as 'normal' (Goodman, 1997). In the present study, the plan was to calculate cut-offs from scores derived from the study sample based on the percentile thresholds, with the aim of identifying adolescents at increased risk of emotional problems.

4.6.3.2. Anxiety and Depression

The short-version of the *Revised Children's Anxiety and Depression Scale* (RCADS-25; Ebesutani, Reise, Chorpita et al., 2012) measured DSM-IV relevant symptoms of anxiety and depression (see Appendix 10). It consists of 25 items scored on a 4-point scale ranging from 0 (*never*) to 3 (*always*); higher scores indicate more severe symptoms. Although

specific anxiety subscales were not included in this version, the items comprising the anxiety total scale included the 5 anxiety-related content domains from the original RCADS. The total 25 items comprised combined anxiety and depression ($\alpha = .89$), while scores from 15 items determined broad anxiety ($\alpha = .81$) and scores from 10 items determined broad depression ($\alpha = .82$). The psychometric properties of the RCADS-25 have proven sufficient across several studies of the young population (Eusutani et al., 2012; Klaufus, Verlinden, Van Der Wal et al., 2020).

4.6.3.3. *Sleep Quality*

The quality and patterns of sleep were measured using the *Pittsburgh Sleep Quality Index* (PSQI; Buysse et al., 1989) (see Appendix 11). This measure differentiates “poor” from “good” sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month. It consists of 19 items scored on a 4-point scale ($\alpha = .77$) ranging from 0 (*not during the past month*) to 3 (*three or more times a week*). Good psychometric evaluations over the years have displayed acceptable applicability across many young samples (Manzar, Zannat, Moiz et al., 2016; Zhang et al., 2020).

4.6.3.4. *Lifestyle and Habits*

The *Lifestyle and Habits Questionnaire-Brief* (LHQ-B; Dinzeo et al., 2013) measures lifestyles and habits of adolescents (see Appendix 12). It is comprised of 21 statements on a 5-point scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Separate scores for each of the four lifestyle domains, namely health and exercise ($\alpha = .88$), substance use ($\alpha = .77$), nutrition ($\alpha = .74$), and sense of purpose ($\alpha = .80$), and total scores for the four domains

($\alpha = .88$), were calculated. Good psychometric properties were reported (Dinzeo, Thayasivam & Sledjeski, 2014).

4.6.3.5. Cognitive emotion regulation strategies

The *Cognitive Emotion Regulation Questionnaire–short version* (CERQ-short; Garnefski et al., 2001) measured cognitive emotion regulation (ER) strategies that adolescents use in response to their experience of threatening or stressful life events (see Appendix 13). The CERQ-short is comprised of 18 items, two items for each of the nine subscales of CERQ. Items are rated on a 5-point scale from 1 (*almost never*) to 5 (*almost always*), with higher scores indicating more pronounced use of the ER strategy. The maladaptive ER subscale ($\alpha = .74$) consisted of self-blame, rumination, catastrophising and other-blame strategies, while the adaptive ER subscale ($\alpha = .74$) consisted of acceptance, positive refocusing, planning, positive reappraisal, and putting into perspective. The psychometric properties of the measure were considered adequate across several studies, in both clinical and non-clinical populations (Abdi et al., 2012; McKinnon et al., 2020; Jermann et al., 2006; Zhu et al., 2008).

4.7. Results

4.7.1. Data cleaning

Prior to data analysis, data were screened for missing values, outliers and normality of distribution. According to Tabachnick and Fidell (2013), if less than 5% of data are missing and follow a random pattern within a large dataset, that is, Missing Completely at Random (MCAR), then this is said to pose relatively few problems for analysis, and missing values can be dealt with via imputation methods. In this study, 28 participants were excluded as

either more than 5% of responses were missing or the same choice had been selected throughout the whole questionnaire (Tabachnick & Fidell, 2018). A missing values analysis was undertaken on the rest of the data which had less than 5% of missing values ($n = 818$) and Little's MCAR test indicated that the data were missing at random, $\chi^2 = 4019.65$, $p = .937$. Therefore, the missing data were resolved using Expectation-Maximisation algorithms for maximum-likelihood estimation, as recommended by Tabachnick and Fidell (2013).

4.7.2. Data analysis

The following statistical tests were used to analyse the data.

- i) Descriptive statistics were calculated to examine the SDQ cut-off scores and prevalence rates of emotional problems of anxiety and depression.
- ii) Chi-square tests and one-way ANOVAs were performed to examine age and gender differences groups of children and adolescents with emotional problems.
- iii) Pearson's correlations were calculated to explore the relationship between emotional problems and risk factors.
- iv) Regression analyses were performed to examine whether risk factors could predict emotional problems in adolescents. Firstly, a binary logistic regression was conducted to predict the odds of being in the at-risk group, using the normal group as the reference group. Secondly, separate hierarchical multiple regression analyses were carried out to examine the predictors of emotional problems, while aiming to isolate predictors which have significant influence on emotional problems of anxiety and depression.

4.7.3. SDQ cut-off points

To explore the distribution of 'caseness' of SDQ data, SDQ scores were grouped (banded) into the three categories as presented by Goodman et al. (2000). Firstly, the banding

of the sample scores were grouped according to the three-group categorisation ('normal', 'borderline' and 'abnormal') alongside the UK norms (www.sdqinfo.com). Secondly, Mauritian cut-offs were generated to classify the 80th–90th percentile band (borderline) and > 90th percentile band (abnormal) in an 80–10–10 distribution (see Table 4). For the overall difficulties, a cut-off score of 19 equated to the 80th percentile (borderline), and a cut-off score of 22 to the 90th percentile (abnormal). These percentiles are often selected as the threshold for various child mental health screening tools (Goodman et al., 2000; Dagvadorj et al., 2019). Hence, the Mauritian sample was classified within the SDQ categories of normal, abnormal and borderline bandings by firstly, using the UK cut-off norms and then secondly, using the Mauritian cut-off norms.

Table 4.

Percentage of the Mauritian sample within the SDQ 3-band categorisation classified according to the UK cut-offs and the Mauritian cut-offs.

	SDQ 3-band categorisation	UK cut-off norms		Mauritius cut-off norms	
		Range of SDQ scores	%	Range of SDQ scores	%
Total Difficulties	Normal	0 – 15	57.7	0 – 18	76.4
	Borderline	16 – 19	23.6	19 – 21	13.2
	Abnormal	20 – 40	18.7	22 – 40	10.4
Emotional Problems	Normal	0 – 5	80.4	0 – 5	80.4
	Borderline	6	7.7	6	7.7
	Abnormal	7 – 10	11.9	7 – 10	11.9
Conduct Problems	Normal	0 – 3	69.8	0 – 4	85.6

	Borderline	4	15.8	5	7.2
	Abnormal	5 – 10	14.4	6 – 10	7.3
Hyperactivity	Normal	0 – 5	65.6	0 – 6	84.9
	Borderline	6	19.3	7	8.7
	Abnormal	7 – 10	15.0	8 – 10	6.4
Peer Problems	Normal	0 – 3	48.0	0 – 5	87.8
	Borderline	4 – 5	39.7	6	7.1
	Abnormal	6 – 10	12.2	7 – 10	5.1
Prosocial Behaviour	Normal	6 – 10	82.5	6 – 10	82.5
	Borderline	5	10.4	5	10.4
	Abnormal	0 – 4	7.1	0 – 4	7.1
Impact	Normal	0	65.9	0	65.9
	Borderline	1	9.4	1-2	18.7
	Abnormal	2 – 10	24.7	3 – 10	15.4

4.7.4. Prevalence of Adolescent Overall Emotional Problems

The prevalence of overall emotional problems and mean SDQ scores across normal and abnormal groups are presented in Table 5. In this study, the abnormal group included both borderline and abnormal SDQ scores ≥ 19 , representing the sample above the 80th percentile. The prevalence of overall emotional problems was 23.6%, with 193 adolescents being categorised to the abnormal group (i.e. having significantly higher levels of overall difficulties). Specifically, in the abnormal group, 19.6% of emotional problems, 15.0% of hyperactivity, 14.4% of conduct problems, 12.2% of peer problems and 17.5% of prosocial behaviour, were reported. The emotional and peer problems subscales were summed yielding a total internalising score, while the conduct and hyperactivity subscales were summed yielding a total externalising score. The adolescents in the abnormal group had a prevalence rate of 31.8% of internalising symptoms and 29.5% of externalising symptoms. Moreover,

34.1% of them reported that the emotional and behavioural problems they faced caused them substantial distress, impairments and interferences in their lives.

Importantly, across the whole study sample, it was common for adolescents to have experienced emotional and behavioural difficulties over the past six months. The mean number of total difficulties experienced was 14.80 ($SD = 5.06$), which falls within the intermediate borderline range and is suggestive of clinical concern (Goodman, 1997). Hyperactivity symptoms were highly reported ($M = 4.78$, $SD = 1.74$), followed by peer relationship problems ($M = 3.79$, $SD = 1.43$), emotional problems ($M = 3.33$, $SD = 2.45$), and lastly, conduct problems ($M = 2.90$, $SD = 1.58$). The sample mean scores for specific anxiety was 14.93 ($SD = 7.35$), 9.30 ($SD = 5.56$) for specific depression, and the mean for total anxiety and depression was 24.22 ($SD = 12.08$).

Table 5.

SDQ scores categorised in the Normal and Abnormal groups

Subscales	Normal Group ($n = 625$)		Abnormal Group ($n = 193$)	
	%	$M (SD)$	%	$M (SD)$
Total Difficulties	76.4	12.62 (3.28)	23.6	21.85 (2.91)
Total Impact	65.9	2.34 (3.00)	34.1	5.44 (3.74)
Total Internalising	68.2	5.91 (2.27)	31.8	11.05 (2.40)
Total Externalising	70.5	6.72 (2.05)	29.5	10.80 (2.27)
Emotional problems	80.4	2.46 (1.88)	19.6	6.13 (1.93)
Conduct problems	85.6	2.45 (1.25)	14.4	4.38 (1.62)

Hyperactivity	85.0	4.27 (1.50)	15.0	6.42 (1.42)
Peer problems	87.8	3.44 (1.19)	12.2	4.92 (1.56)
Prosocial behaviour	82.5	7.63 (1.96)	17.5	7.24 (2.06)

4.7.5. Prevalence of Adolescent Emotional Problems across Gender

The prevalence of overall emotional problems within the abnormal group was further examined across genders. Results from the analysis of the broader domains of the SDQ scale indicated that, compared to boys, girls reported a higher percentage of general difficulties (14.1% vs. 9.5%) and a higher rate of distress and impairments (31.3% vs. 23%) in their lives. Within the specific subscales, girls had higher prevalence rates of emotional problems (12.6% vs. 7%) and hyperactivity (8.1% vs. 7%) compared to boys. In contrast, boys experienced higher conduct (7.7% vs. 6.7%) and peer problems (6.7% vs. 5.5%) but exhibited more prosocial behaviour (10.5% vs. 7%) than girls. Overall, the most common experienced difficulty among girls was emotional problems, while among boys it was conduct problems.

4.7.5.1. Gender effects on overall Emotional Problems

No significant associations were found between gender and participants' ethnicity, age groups, nationality, schools and districts (all $ps > .05$). However, a significant association between gender and the normal and abnormal groups was found, $X^2(1, N = 818) = 4.32, p = .038$. To further explore gender effects on overall emotional problems across the abnormal group and the whole sample, separate between-subjects Analysis of Variance (ANOVA) tests were conducted.

4.7.5.2. Gender effects across the Abnormal group

Across the abnormal group, significant gender effects were revealed on the broad SDQ category of total impact, and the specific subscales of emotional and conduct problems. Girls reported significantly more emotional problems and impact of distress and impairments than boys. While boys reported significantly more conduct problems than girls (see Table 6). Effect sizes for the significant variables were relatively large.

Table 6.

Gender effects on overall emotional problems in adolescents across the Abnormal Group

Overall Emotional Problems	Girls <i>n</i> = 115		Boys <i>n</i> = 78		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<i>SDQ Broad categories</i>							
Total Difficulties	21.82	2.66	21.90	3.25	.035	.85	.001
Total Impact	3.44	3.53	2.66	3.32	4.80	.03*	.025
Internalising Problems	15.17	2.17	10.86	2.70	.802	.37	.004
Emotional Problems	6.41	1.90	5.72	1.91	6.11	.01*	.031
Externalising Problems	10.64	2.15	11.04	2.43	1.41	.24	.007
Conduct Problems	4.16	1.42	4.71	1.83	5.46	.01*	.028
Hyperactivity	6.49	1.47	6.33	1.35	.543	.46	.003
Peer Problems	4.77	1.48	5.14	1.66	2.71	.10	.014
Prosocial Behaviour	7.29	2.05	7.18	2.10	.125	.72	.001

Note. **p* < .05

4.7.5.3. Gender effects across whole sample

Across the whole study sample, significant gender differences were revealed for emotional problems, conduct problems, prosocial behaviour, total internalising problems and total impact. Girls reported significantly more emotional problems, internalising symptoms, significant impairments and distress and more prosocial behaviour than boys, whereas boys reported more conduct problems than girls. No significant gender differences emerged for SDQ variables of total difficulties, externalising problems, hyperactivity, peer problems and RCADS variables of anxiety, depression, and total anxiety and depression (see Table 7). Effect sizes for the significant variables ranged from medium to large.

Table 7.

Gender effects on adolescent overall emotional problems across the whole sample

Overall Emotional Problems	Girls <i>n</i> = 434		Boys <i>n</i> = 384		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<i>SDQ Broad categories</i>							
Total Difficulties	15.06	5.15	14.51	4.94	2.35	.13	.003
Total Impact	3.44	3.53	2.66	3.32	10.50	< .01	.013
Internalising Problems	7.46	3.22	6.73	3.08	10.75	< .01	.013
Emotional Problems	3.71	2.54	2.89	2.27	23.78	< .001	.028
Externalising Problems	7.60	2.73	7.78	2.71	.91	.34	.001
Conduct Problem	2.78	1.44	3.04	1.71	5.39	< .05	.007
Hyperactivity	4.81	1.80	4.74	1.67	.366	.55	.001
Peer Problems	3.74	1.40	3.85	1.47	1.03	.31	.001
Prosocial Behaviour	7.78	1.89	7.27	2.06	13.25	< .001	.016
<i>RCADS</i>							
Anxiety	15.11	7.13	14.72	7.59	.595	.44	.001

Depression	9.59	5.45	9.07	5.67	1.12	.29	.001
Total Anxiety and Depression	24.60	11.66	23.79	12.53	.92	.34	.001

4.7.6. Age effects on overall Emotional Problems

Age effects of the sample (lower age group of 12-14 years [$n = 610$] and higher age group of 15-17 years [$n = 208$]) on overall emotional problems were examined.

4.7.6.1. Age effects across the Abnormal Group

Across the abnormal group, a significant age effect emerged only for the broad SDQ category of total impact, $F(1, 191) = 12.93, p < .001, \eta^2 = .06$. The higher age group (15-17 years) ($M = 6.81, SD = 3.81$) reported significantly more impact of distress and impairments than the lower age group (12-14 years) ($M = 4.79, SD = 3.54$).

4.7.6.2. Age effects across whole sample

Significant differences between the age groups were reported with respect to all broader categories of SDQ total difficulties, total impact and internalising and externalising problems. Significant age group differences also emerged for subscales of emotional problems and hyperactivity. The older age group of 15 to 17 years scored significantly higher on these factors. For the significant variables, the effect sizes ranged from medium to large (refer to Table 8).

Table 8.

Age effects on adolescent Overall Emotional Problems

Overall Emotional Problems	12 – 14 year group (<i>n</i> = 610)		15 – 17 year group (<i>n</i> = 208)		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<i>SDQ Broad categories</i>							
Total Difficulties	14.44	4.94	15.85	5.27	12.19	.00**	.015
Total Impact	2.80	3.30	3.87	3.75	15.10	.00***	.018
Internalising Problems	6.90	3.06	7.76	3.41	11.54	.00**	.014
Emotional Problem	3.16	2.36	3.83	2.64	11.78	.00**	.014
Externalising Problems	7.54	2.65	8.09	2.89	6.34	.01*	.008
Conduct Problem	2.85	1.55	3.05	1.65	2.51	.11	.003
Hyperactivity	4.69	1.69	5.04	1.85	6.26	.01*	.008
Peer Problems	3.74	1.40	3.93	1.52	2.69	.10	.003
Prosocial Behaviour	7.56	1.97	7.48	2.04	.292	.59	.001
<i>RCADS</i>							
Anxiety	15.06	7.34	14.52	7.39	.837	.36	.001
Depression	9.09	5.49	9.88	5.73	3.07	.08	.004
Total Anxiety and Depression	24.16	12.07	24.40	12.12	.062	.80	.001

Note. **p* < .05 , ***p* < .01 , ****p* < .001

4.7.7. Risk factors for overall Emotional Problems

To explore the relationship between risk factors and overall emotional problems, Pearson’s correlations were calculated (Table 9 and Table 10). In relation to emotion regulation (ER) (Table 9), results revealed significant positive relationships between all maladaptive ER strategies (self-blame, rumination, other-blame and catastrophising), the SDQ total difficulties, and total impact. They correlated most strongly with the subscale of emotional problems. Putatively maladaptive ER strategies also positively correlated with anxiety and depression separately and most strongly, with total anxiety and depression.

Catastrophising ER strategy in particular was significantly associated with overall emotional problems. The SDQ subscale of prosocial behaviour positively correlated with adaptive emotion regulation strategies, and in particular, with refocus on planning, positive reappraisal and acceptance. It also shared weak negative relationships with rumination, other-blame and catastrophising strategies. No significant relationships emerged between adaptive ER strategies and SDQ outcomes, but they significantly correlated with anxiety and depression.

Overall, correlations between quality of sleep and overall emotional problems displayed positive relationships (Table 10). In particular, sleep quality was most strongly correlated with emotional and behavioural difficulties, especially emotional problems, suggesting that poor scores of sleep quality are related to emotional problems. Sleep quality also shared a weak negative relationship with prosocial behaviour.

Significant correlations emerged between lifestyle risk factors and overall emotional problems (Table 10). Media usage was positively correlated with emotional problems, being most strongly related to conduct problems and depression. Health and exercise were negatively correlated to emotional problems except conduct problems and were mostly negatively correlated with depression. Substance use shared mostly weak negative relationships with anxiety, depression, and total anxiety and depression, suggesting less substance use was negatively to emotional problems. Nutrition also had a weak positive relationship with prosocial behaviour but was most negatively related to depression. Sense of purpose was negatively related to overall emotional problems and was most strongly related to depression and shared a weak positive relation with prosocial behaviour.

Table 9.

Pearson's Correlations between Cognitive ER Strategies and Overall Emotional Problems

	Total Difficulties	Total Impact	Emotional Problems	Conduct Problems	Hyperactivity	Peer Problems	Prosocial Behaviour	Anxiety	Depression	Total Anxiety and Depression
Acceptance	.07*	.093**	-.095**	-.015	.055	.042	.089*	.196***	.137***	.182***
Positive Refocusing	.046	.054	.011	.052	.007	.079*	.047	.134***	.012	.087*
Refocus on Planning	-.028	-.037	-.046	-.001	-.026	.013	.150***	.066	-.071*	.007
Positive Reappraisal	-.015	.052	-.010	-.034	.007	.039	.138***	.102**	.017	.070*
Perspective Taking	.130***	.014**	.104**	.058	.123***	.067	.036	.216***	.149***	.200***
Self-Blame	.322***	.254***	.285***	.146***	.261***	.173***	.023	.362***	.382***	.396***
Rumination	.247**	.195***	.219***	.108***	.145***	.202***	-.079*	.339***	.302***	.345***
Other- Blame	.178***	.121**	.063*	.186***	.120***	.169***	-.101**	.269***	.279***	.292***
Catastrophising	.350***	.283***	.316***	.194***	.230***	.204***	-.014***	.368***	.401***	.409***
Adaptive CERQ	.064	.067	.045	.017	.049	.071*	.139***	.213***	.071*	.162***
Maladaptive CERQ	.392***	.305***	.320***	.222***	.269***	.264***	.000	.474***	.483***	.511***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 10.

Pearson's Correlations between Sleep and Lifestyle and Overall Emotional Problems

	Global PSQI	Media Usage	Health and Exercise	Substance Use	Nutrition	Sense of Purpose
SDQ						
Total Difficulties	.41***	.126***	-.192***	-.061*	-.105**	-.140***
Total Impact	.334***	.075*	-.187***	-.020	-.121***	-.122***
Emotional Problem	.370***	.093***	-.201***	-.020	-.007	-.113**
Conduct Problem	.241***	.148***	-.036	-.051	-.125***	-.122***
Hyperactivity	.308***	.125***	-.135***	-.024	-.139***	-.074*
Peer Problems	.169***	-.032	-.131***	-.094**	-.051	-.079*
Prosocial Behaviour	-.074*	-.010	.116***	.067*	.163***	.117***
RCADS						
Anxiety	.202***	.041	-.283***	-.167***	-.213***	-.209***
Depression	.313***	.150***	-.346***	-.176***	-.287***	-.288***
Total Anxiety and Depression	.267***	.094***	-.332***	-.183***	-.262***	-.260***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

4.7.8. Predictors of Overall Emotional Problems in Adolescents

The last stage of analysis explored whether risk factors were able to predict overall emotional problems of adolescents. Firstly, it was investigated whether certain risk factors could potentially predict the chance of adolescents being classified within the at-risk group (abnormal group) compared to the normal group. Secondly, the analysis explored whether certain risk factors predicted emotional problems of anxiety and depression separately.

4.7.8.1. Predictors of Abnormal group membership

A binary logistic regression was conducted to predict the odds of being in the at-risk group using variables of gender, age range, sleep quality, emotion regulation strategies, and lifestyle domains as predictors. All risk factors were entered in a single step predicting the two normal and abnormal mental health levels, comparing the at-risk group (abnormal level) against the normal group (the reference category). A test of the final model was significant, indicating that the predictors as a set, significantly predicted the odds of being in the at-risk group, $\chi^2(17) = 139.78, p < .001$.

As seen in Table 11, increases in maladaptive ER strategies of self-blame and catastrophising and poorer quality of sleep were associated with greater odds of being at-risk for mental health problems compared to normal adolescents. When comparing the at-risk group to the normal group, odd ratios for significant effects ranged from OR = 1.12 (95% CI [1.02, 1.23]) for self-blame to OR = 1.23 (95% CI [1.15, 1.32]) for poor sleep quality. These results indicated that for every one-unit increase in risk factors of self-blame, catastrophising and poor sleep quality, the odds of experiencing mental health problems were between 1.12 and 1.23 times greater.

Moreover, as the scores of adaptive ER strategy of positive reappraisal increased (i.e., greater positive self-reappraisal), the odds of being in the at-risk group for mental health problems decreased. Every one-unit increase in positive reappraisal rating resulted in a 12% decreased risk of being in the abnormal group for mental health problems compared to the normal group (OR = 0.88, 95% CI [0.80, 0.97]).

Table 11.

Binary Logistic Regression model predicting abnormal group by risk factors

Predictor	<i>b</i> (SE)	Wald	OR	95% CI for OR
Normal vs. Abnormal group				
Gender	-0.36 (0.19)	3.35	0.70	[0.48, 1.03]
Age Range	0.15 (0.21)	0.48	1.16	[0.76, 1.76]
Self-Blame	0.12 (0.05)	5.76*	1.12	[1.02, 1.23]
Rumination	0.06 (0.05)	1.62	1.07	[0.97, 1.18]
Other-Blame	0.04 (0.05)	0.67	1.04	[0.94, 1.15]
Catastrophising	0.14 (0.05)	8.91**	1.15	[1.05, 1.25]
Acceptance	0.04 (0.05)	0.83	1.05	[0.95, 1.15]
Positive Refocusing	0.05 (0.05)	1.22	1.05	[0.96, 1.15]
Refocus on Planning	-0.06 (0.05)	1.49	0.95	[0.86, 1.04]
Positive Reappraisal	-0.12 (0.05)	6.20*	.88	[0.80, 0.97]
Perspective Taking	-0.02 (0.05)	0.16	.98	[0.89, 1.08]
Health & Exercise	-0.02 (0.02)	1.10	.98	[0.94, 1.02]
Substance Use	-0.01 (0.01)	0.18	1.00	[0.97, 1.02]
Nutrition	-0.01 (0.03)	0.05	0.99	[0.93, 1.06]
Sense of Purpose	0.01 (0.03)	0.02	1.01	[0.94, 1.07]
Media Usage	-0.02 (0.10)	0.03	.98	[0.81, 1.20]
Poor Sleep Quality	0.21 (0.04)	35.28***	1.23	[1.15, 1.32]

Note. *b* = unstandardised beta coefficient; OR = odds ratio; CI = confidence interval.

$R^2 = .16$ (Cox & Snell), $.24$ (Nagelkerke). Model $\chi^2(17) = 139.78, p < .001$.

* $p < .05$, ** $p < .01$, *** $p < .001$

4.7.9. Predictors of Anxiety and Depression

Separate hierarchical multiple regression analyses were carried out to examine the predictors of anxiety and depression. Only variables that were significantly correlated with anxiety and depression were included in the analyses. Firstly, a four-stage hierarchical multiple regression was conducted with anxiety (Table 12) as the outcome variable. The first step consisted of age and gender to control for demographic effects, if any. Sleep quality was

entered at step 2 and lifestyle variables of health and exercise, substance use, nutrition, and sense of purpose entered at step 3. The maladaptive ER strategies were entered at step 4. The overall regression model accounted for approximately 29% of variance in anxiety, $R^2 = .29$, $F(8, 808) = 41.15$, $p < .001$. Age and gender did not emerge as significant predictors in step 1, while sleep quality predicted approximately 2.4% of variance in anxiety. In step 3, the lifestyle variables explained an additional 9.7% of the variance in anxiety, though only health and exercise, and sense of purpose were significant (negative) predictors of higher anxiety. After controlling for variables from step 1 to step 3, finally at step 4, maladaptive ER strategies positively predicted higher anxiety, accounting for 16.7% of the variance in anxiety.

Table 12.

Hierarchical Multiple Regression analysis of risk factors predicting Anxiety

	<i>B</i>	<i>T</i>	<i>R</i> ²	ΔR^2	<i>F</i> Change
Predictors					
Step 1			0.002	0.002	0.67
Age Group	-0.09	-.3.01**			
Gender	-0.02	-.0.52			
Step 2			0.026	0.024	20.03***
Sleep Quality	0.03	0.89			
Step 3			0.123	0.097	22.39***
Health & Exercise	-0.15	-4.54***			
Nutrition	-0.06	-1.70			
Substance Use	-0.05	-1.58			
Sense of Purpose	-0.07	-1.96*			
Step 4			0.289	0.167	189.61***
Maladaptive ER Strategies	0.43	13.77***			

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

The same hierarchical regression analysis was conducted with depression as the outcome variable (Table 13). The final regression model predicted approximately 35% of the variance in depression, $R^2 = .35$, $F(8, 809) = 55.29$, $p < .001$. As with anxiety, age and gender did not emerge as significant predictors of depression in step 1. Sleep quality accounted for approximately 6.5% of variance in depression. In step 3, the lifestyle variables explained 13.8% of the variance in depression, though only health and exercise, nutrition, and sense of purpose were significant (negative) predictors of higher depression. After controlling for variables from step 1 to step 3, finally at step 4, maladaptive ER strategies positively predicted higher depression, accounting for 14.5% of the variance in depression.

Table 13.

Hierarchical Multiple Regression analysis of risk factors predicting Depression

	<i>B</i>	<i>T</i>	<i>R</i> ²	ΔR^2	<i>F</i> Change
Predictors					
Step 1			0.005	0.005	2.18
Age Group	-0.01	-0.35			
Gender	-0.03	-0.99			
Step 2			0.067	0.065	57.08***
Sleep Quality	0.13	4.37***			
Step 3			0.202	0.138	35.27***
Health & Exercise	-0.17	-4.96***			
Nutrition	-0.11	-3.26**			
Substance Use	-0.03	-0.89			
Sense of Purpose	-0.12	-3.68***			
Step 4			0.353	0.145	181.57***
Maladaptive ER Strategies	0.40	13.48***			

Note. ** $p < .01$; *** $p < .001$

4.8. Discussion

The primary aim of this study was, firstly, to explore emotional problems among adolescents aged 12 to 17 years in Mauritius. Secondly, the study aimed to examine potential risk factors which can predict emotional problems in these adolescents. The prevalence rate was 31.8% for overall emotional problems among adolescents. The prevalence rate of this study seems comparable to the prevalence rate of emotional problems (41%) across LMICs, as ascertained by the systematic review in Chapter 3 and also across different HICs (Deighton et al., 2019; Dessauvagie et al., 2020; Lawrence et al., 2015; Phillips & Yu, 2021). However, due to most adolescents living in LMICs, these prevalence rates translate into an enormous number of affected youth. The prevalence rate leads to major youth mental health implications and the impact may be detrimental to youth in LMICs, given the stigma, poor living conditions, discrimination and limited access to mental health care services in LMICs (Heim et al., 2018; Getanda et al., 2017; Patel et al., 2016).

The second research question examined the percentage of the adolescent sample vulnerable to being at risk of overall emotional and behavioural difficulties. Findings of the study suggest that 23.6% of the adolescent sample were at-risk, having levels of total difficulties in the abnormal range. Cut-off points were explored in this study by deriving percentile norms of the 80–10–10 distribution of the Mauritian sample. These were then calculated and compared to the original UK cut-offs scores.

Application of the UK cut-off values to the Mauritian sample could have led to extremely high rates of abnormal scores for total difficulties, conduct problems, hyperactivity and peer problems scores. Using UK cut-off values, 42% of the adolescent sample were rated as being in the ‘abnormal’ range for total difficulties, in contrast to the normative expectation of 20%. Using the UK cut-off values, there may therefore be a temptation to interpret these findings as indicative of higher mental health problems and lead to post-hoc hypotheses that

Mauritian adolescents may have a particular predisposition to mental health problems as a result of various genetic or environmental factors such as poverty or cultural factors.

However, as Goodman et al. (2012) very astutely suggested, the estimation of emotional problems can be difficult to ascertain across countries, particularly when population-specific norms are absent, as is the case with Mauritius. Hence, the new Mauritian cut-off values found (based on the same 80–10–10 proportions used by Goodman et al. [2000] in the UK sample) in the current study, can be used as a research indicator for further exploration and follow-up in Mauritius.

In relation to the third research question, both gender and age effects on emotional problems emerged across the sample of adolescents, though small. In the abnormal group, significant gender differences were found. Female adolescents reported greater emotional problems and impact of distress than males, whereas male adolescents reported more conduct problems. The same trend was also observed across the whole sample, where female adolescents additionally reported higher prosocial behaviour than males. This finding is consistent with empirical research that has argued for a gender effect on emotional problems in general. Over the years and across different countries and varying contexts, emotional problems seem to affect young girls to a greater extent than young boys (Fink et al., 2015; Tick et al, 2008; Torikka et al., 2014; Van Droogenbroek et al., 2018; West & Sweeting, 2003; Wiklund et al., 2012; WHO, 2001).

Furthermore, the findings of the study indicate that in the abnormal group, the older group of adolescents (15-17 years) experienced more impact of distress and impairments in their lives due to the overall emotional and behavioural difficulties they faced than the younger adolescents (12-14 years). In addition, across the whole sample, the older adolescents also reported greater overall difficulties, total impact, internalised problems, externalised problems, emotional problems and hyperactivity, compared to the younger

adolescents. Research has shown that both emotional problems tend to increase during adolescence (e.g., Cohen et al., 1993; Woodward & Fergusson, 2001) and adolescents with comorbid emotional problems tend to be older than those with specific anxiety or depression (Marikangas & Avenevoli, 2002).

Interestingly however, the demographic effects of gender and age on emotion problems significantly decreased in the presence of other risk factors such as sleep quality, health and exercise and maladaptive ER strategies. This suggests that these demographic effects on emotional problems may not be static and fixed features in individuals but are mediated by complex interactions with the environment. It may be a plethora of biological, environmental, cultural and experiential underpinnings that provide a useful window into the mechanisms of risk factors in emotional problems (Altemus, Sarvaiya, & Epperson, 2014). Studies indicate that during childhood and adolescence, the acquisition of skills to regulate emotions is closely related to the neurobiological maturation that shapes different levels of organisation at a physiological, cognitive and behavioural level (Chaplin & Aldao, 2013; Cole, 2014). However, certain characteristics of the context in which children and adolescents develop, modulate the skills with which each child learns to express and regulate emotions (Sanchis-Sanchis, Grau, Moliner et al., 2020). The modulation of emotion problems may also relate to cognitive vulnerabilities of children and adolescents. As children grow, they are confronted with more stressful life experiences, build more negative beliefs about the self, negative attributional styles, dysfunctional attitudes, cognitive distortions and rumination (Jacobs, Reinecke, Gollan et al., 2008; Nolen-Hoeksema, 2000; Rudolph, Hammen, & Daley, 2006). Given these cognitive vulnerabilities, interpersonal difficulties may also arise with peers, family and teachers, exacerbating their emotional difficulties (Nolan et al., 2003).

The last research question examined the predictors of emotional problems among the sample of adolescents. Firstly, the specific predictors of belonging to the at-risk (abnormal) group was poor sleep and the maladaptive ER strategies of self-blame and catastrophising. Moreover, increased adaptive ER strategy of positive reappraisal decreased the probability of being in the at-risk group. Secondly, the specific predictors of anxiety were poor lifestyle variables of health and exercise and sense of purpose, and the use of maladaptive ER strategies. Lastly, the specific predictors of depression were poor sleep, poor lifestyles variables of health and exercise, nutrition and sense of purpose, and the use of maladaptive ER strategies.

One emerging main predictor of emotional problems in this study was unhealthy lifestyle behaviours. Research has documented that these behaviours contribute to poorer health-related quality of life and they have a prolonged negative influence on psychological wellbeing (Dumuid, Olds, Lewis et al., 2017; O'Neil, Quirk, Housden et al., 2014; Wu, Zhuang, Li et al., 2019). Better nutrition is associated with better mental health (Dimov, Mundy, Bayer et al., 2021) and increased exercise has been linked to fewer depressive symptoms (Kremer, Elshaug, Leslie et al., 2014). However, 90% of youth across the world do not meet the required nutrition consumption guidelines, leading them to be at risk of experiencing emotional problems (Boylan, Hardy, Drayton et al., 2017; Houghton, Hunter, Rosenberg et al., 2015). More than half (55%) of overweight children lived in LMICs, with Africa and Asia accounting for the largest shares of global burden (LBD Double Burden of Malnutrition Collaborators, 2020). Unhealthy eating habits have been found to be prevalent among Mauritian children (Bahadoor, Toorabally & Subratty, 2016; Bundhun et al., 2018) and this unhealthy lifestyle can worsen emotional and health problems, if programs addressing healthy lifestyle are not implemented by policy-makers in Mauritius (Rambaree, Mousavi, Magnusson et al., 2020).

Furthermore, sleep also emerged as a significant predictor of emotional problems, especially depression. Sleep quality and duration in adolescents has been found to decrease sharply with age (Maslowsky & Ozer, 2014; Olds, Maher, Blunden et al., 2010; Ohida, Osaka, Doi et al., 2004; Matricciani, Blunden, Rigney et al., 2013). Adolescents tend to stay up late at night and then have to wake up early for school. Later bedtimes lead to a lack of sleep in adolescents which impacts their mood. Indeed, poor sleep is associated with deficits in functioning across a wide range of indicators of psychological, interpersonal, and somatic well-being (Roberts & Duong, 2014). For example, adolescents with disturbed sleep report more depression, anxiety, anger, inattention, conduct problems, drug and alcohol use, impaired academic performance, and suicidal thoughts and behaviours (Fredriksen, Rhodes, Reddy et al., 2004; Roberts, Roberts, & Xing, 2011). They also have been reported to have more fatigue, less energy, worse perceived health, and symptoms such as headaches, stomach aches, and backaches (Carskadon, 2002; Roberts, Roberts, & Chan, 2009).

There is now compelling evidence for linkages between sleep difficulties, regulation of emotions, cognitive biases and the development of emotional problems of anxiety and depression (Brand, Kirov, Kalak et al., 2016; Weems, Berman, Silverman et al., 2001; Weems, Costa, Watts et al., 2007). For example, cognitive factors, such as cognitive errors and control beliefs linked with anxiety and depression, have been found to be associated with sleep disturbances among adolescents (Alfano et al., 2009). Some pre-sleep thought activities such as negative interpretation biases and negative emotional regulation strategies like rumination and worry may take place at night and interfere with sleep onset, sleep quality and sleep duration in youth with elevated internalizing symptoms. Indeed, adolescents with poor sleep patterns display negative mood and decreased ability to control negative emotions (Baum, Desai, Field et al., 2014; Reddy, Palmer, Jackson et al., 2017; Short & Louca, 2015). Several studies have argued that adverse changes in regulation of emotions and more use of

maladaptive emotion regulation strategies might be a risky pathway by which sleep problems increase the risk of emotional problems or vice versa (Brand et al., 2016; Chaput & Janssen, 2016; Hildenbrand, Daly, Nicholls et al., 2013). Hence, emotion dysregulation and cognitive biases may exacerbate sleep problems, thereby increasing the risk of emotional problems among children and adolescents, leading to significant long-term negative consequences for emotional wellbeing and functioning (Alfano et al., 2009; Kosticova, Husarova, & Dankulincova, 2020).

Adolescence is a crucial developmental window with vast opportunity to foster functional emotion regulation (Stegge & Meerum Terwogt, 2007). However, because adolescence is often compromised by heightened experiences of negative emotions and stress, adolescents may be at a greater risk for dysfunctional emotion regulation (Ahmed et al., 2015). Indeed, in the present study, maladaptive ER strategies have emerged as the most significant predictors of comorbid emotional problems and specific anxiety and depression among the sample of adolescents. The findings also suggest that more psychopathology of emotional problems was observed in adolescents using maladaptive ER strategies like self-blame and catastrophising and less psychopathology was observed in adolescents using the more adaptive strategy of positive reappraisal. These results add support to findings of previous studies where similar relationships were found (e.g. Garnefski, Hossain, & Kraaij, 2017). For example, a meta-analytic review of 35 studies (Schafer, Naumann, Holmes et al., 2017) also found empirical support for the link between ER strategies and depressive and anxiety symptoms in adolescence. Importantly, more frequent use of maladaptive ER strategies has been linked to more psychopathological outcomes. Hence, the present study shows that the maladaptive ER strategies predicting emotional problems of anxiety and depression in an unresearched developing country like Mauritius, do not differ from the findings of maladaptive strategies predicting emotional problems in economically more

developed countries. This underlines the universal importance of cognitive emotion regulation strategies as associated factors of emotional problems.

4.9. Limitations

The current study has a few limitations to be considered. Firstly, the study made use of self-report questionnaires. Therefore, there might have been a possibility that adolescents provided socially desirable responses. Adolescents may have provided responses that they believed were consistent with Mauritian social norms and expectations. There is stigmatisation associated with mental illnesses in Mauritius, for instance, people with mental illnesses are often labelled as ‘mad people’. Hence, while bearing in mind this stigma, adolescents may refrain from expressing their true feelings and emotions in relation to their mental health. However, given that the questionnaires were completely anonymous, there might have been reduced likelihood of social desirability bias occurring. The methodology might be improved by combining self-ratings with parent- or teacher-ratings. Mauritius being a multi-lingual country, makes use of English language in teaching in educational settings. Hence the questionnaires, in standardised English language were used in the study. However, language may have introduced biases in subtle ways. Mental and verbal switching in different languages is very common in Mauritius, hence when filling in the questionnaires, participants may mentally translate certain English words into French or Creole words which do not carry the same meanings. For this reason, a language-based bias might have occurred and this area would benefit more from empirical exploration. Secondly, no diagnostic assessment was used along with the rating scales. However, given that in Mauritius population-specific norms were non-existent, estimation of emotional problems was difficult. It was hence not possible to determine the sensitivity and specificity of the proposed cut-off scores which was based on the 80–10–10 distribution. An ideal next step would be to perform population-based studies

among Mauritian young people to provide clinical evaluations of measures and establish population-specific diagnostic criteria.

4.10. Conclusion

The findings of this study provide evidence for emotional problems among adolescents of Mauritius. A significant number of Mauritian adolescents are at risk of mental health problems. Significant age and gender effects have been found, with older adolescents and girls reporting greater emotional problems than younger adolescents and boys, respectively. Poor quality of sleep was a predictor of being in the at-risk group and being depressed. Poor health and exercise, and sense of purpose, significantly predicted both anxiety and depression, while nutrition significantly predicted depressive symptoms only. Maladaptive ER strategies significantly predicted anxiety and depression and increased the risk of being in the at-risk group. This is the first study examining the prevalence rates of emotional problems in Mauritian adolescents. Further studies could consider replicating the findings in a different population, that is, clinical adolescents. Both a clinical and non-clinical population could benefit from a transdiagnostic intervention programme, particularly aiming at prevention of emotional problems of anxiety and depression and emotion regulation.

4.11. Summary

To the best of knowledge, this study provides an original contribution to knowledge by examining the prevalence of emotional problems and determining cut-off points of the sample at risk of emotional problems, in the previously unresearched culture of Mauritius. Importantly, findings of this study have added support to the high prevalence of emotional problems found among youth in LMICs (as previously discussed in Study 1). This study has found that there is a high prevalence of youth emotional problems in Mauritius and cognitive

maladaptive ER strategies are significant risk factors of emotional problems. Hence, given that now there is evidence of mental health problems among youth in Mauritius, there is an urgent need for intervention programmes. The next chapter will examine the literature on CBT-based transdiagnostic interventions and the transportability of such interventions across different populations, contexts and culture in LMICs.

Chapter 5:

Cognitive Behaviour Therapy interventions for the treatment and prevention of emotional problems in low- and middle-income countries (LMICs)

5. Overview

The last chapter examined the literature on emotional problems and the associated risk factors that could contribute to the development of emotional problems such as anxiety and depression in young people. However, most of the empirical evidence emerged from high-income countries (HICs), with limited evidence from LMICs. This chapter aims to identify CBT-based interventions along the continuum of care that promote positive mental health, that strive to prevent the onset of emotional problems as well as provide treatment for emotional problems. Interventions that specifically target risk factors will be addressed.

5.1. Context

Given the long-term negative impact of emotional problems, countries across the globe struggle to keep up with the mental health needs of their adolescent populations. Nevertheless, high-income countries (HICs) lead the way in the development of intervention programmes for the prevention and treatment of emotional problems. Systematic reviews, predominantly from HICs, have evidenced that comprehensive youth mental health interventions across schools, families and communities, lead to improvements not only in mental health but also in social functioning, academic performance, and general health behaviours (Durlak & Wells, 1997; Hosman & Jan-Llopis, 1999; Jane-Llopis, Barry, &

Hosman, 2005; Herman, Saxena, & Moodie, 2005; Nores & Barnett, 2010; Baker-Henningham & Lopez Boo, 2010; Weare & Nind, 2011). Despite the recognition of the importance of mental health interventions for children and adolescents, mental health interventions remain a neglected public health issue in LMICs compared to HICs. The gap between the burden of mental health problems and available evidence-based services is staggering in LMICs (Whiteford, Degenhardt, Rehm et al., 2013), with a treatment gap as high as 90% (Docerty, Shaw, Goulding et al., 2017). Whereas one out of every five persons with emotional problems receives minimally adequate care in HICs, only one out of ten receives care in upper-middle income countries, and one out of 27 in lower-middle income countries (Thornicroft, Chatterji, Evans-Lacko et al., 2017). One of the main differences between HICs and LMICs lies in the stigma associated with mental illness (Heim, Korht, Koschorke et al., 2018). In LMICs, there is high levels of stigma associated with mental health problems that result in delayed help seeking, reduced access to health services, suboptimal treatment, poor outcomes and an increased risk of individuals' human rights violations (Javed, Lee, Zakaria et al., 2021). Mental health stigma challenges the individual, the societal and the mental health care systems in LMICs (Mascayano, Armijo & Yang, 2015). Even if individuals with mental illness try to overcome barriers to seek help, they are still at risk of being confronted with stigmatising beliefs, negative attitudes and discrimination, which hinders their help-seeking behaviour and ultimately their right to adequate mental health care.

Other differences between HICs and LMICs pertain to the organisation of mental health services, where poorer resourced countries have little or no mental health service structures (Purgato, Uphoff, Singh et al., 2020). There is a high and persistent scarcity of skilled human resources, large inequities and inefficiencies in resource distribution and utilisation, limited community awareness of mental health, poverty and social deprivation

associated with mental illness (Barber, Gronholm, Ahuja et al., 2019), which act as major barriers to closing the treatment gap. Moreover, despite 70% of global mental illnesses occurring in LMICs (Vigo, Thornicroft & Atun, 2016), most LMICs spend less than 1% of their health budget on mental health care (Lima, Bernadi, Yamada et al., 2021). Recently, researchers have advocated for scaling up evidence-based interventions and the cultural adaptation of these interventions (Heim et al., 2018; Mascayano, Toso-Salman, Ho et al., 2020), increasing the mental health budget allocation (Javed, Khan, Nasar et al., 2020) and task-shifting of mental health interventions to non-specialists as key strategies for closing the treatment gap (Patel, Saxena, Lund et al., 2018; Purgato et al., 2020).

The above key challenges of treatment gap in LMICs also seem to be applicable to the LMIC of Mauritius. Mauritius spends approximately 2% of the GDP on health with government expenditure per capita on mental health being less than 4 Mauritian rupees, which works out to be less than 0.01% of the health GDP on mental health (Musango, 2021). Due to high levels of stigmatisation of mental illness and absence of mental health prevention framework in Mauritius, WHO (2020) has projected that one in four Mauritian people will be affected by a mental health problem at some point in their lives. Hence, a priority setting approach is mandated in Mauritius with legislations and policies that focus on adequate funding allocation, resources and evidence-based awareness programmes on mental health.

5.2. Evidence-based Interventions for Emotional Problems

Efforts to address the mental health needs of children and adolescents, especially in LMICs, remain a neglected issue (Zhou, Ouyang, Nergui et al., 2020). The Mental Health Gap Action Programme (mhGAP) was launched to scale up mental health care while emphasising on providing evidence-based interventions in non-specialised healthcare settings in LMICs (WHO, 2010). It was advocated that evidence-based interventions be transported

from high-income settings (HICs) to low-and middle-income settings (LMICs) and be further developed and adapted to the geographical and cultural demands of the resource-limited countries (WHO, 2007; Patel, Chowdhary, Rahman et al., 2011). Recent systematic reviews and meta-analyses (Bradshaw, Gericke, Coetzee et al., 2021, Caldwell, Davies, Hetrick et al., 2019; MacKenzie & Williams, 2018) have indicated mixed findings on the suggestibility of adapting evidence-based psychological intervention approaches from HICs to LMICs. Interventions in LMICs have specifically addressed emotional problems of children and adolescents across different cultures, and often via non-specialist delivery models (Brown, Graaff, Annan et al. 2017; Jordans, Pigott & Tol, 2016; Pedersen, Smallgange, Coetzee et al., 2019), however, inconsistencies in findings remain and these will be addressed in the sections below.

5.3. Cognitive Behaviour Therapy (CBT)

A landmark evidence-based approach to treating emotional problems in youth has been cognitive behaviour therapy (CBT), being the most empirically researched and supported psychological intervention (Cristea, Stefan, Karyotaki et al., 2017; David, Cristea, & Hofmann, 2018; DeRubeis & Lorenzo-Luaces, 2017). CBT is the generic term for therapy techniques based on cognitive and behaviour models of human behaviour to help alleviate psychological distress (Laidlaw, Thompson, Gallagher-Thompson et al, 2003). CBT interventions, involving a range of therapeutic strategies, aim to modify patterns of dysfunctional behaviour and distorted/maladaptive thoughts that cause and maintain emotional distress and problematic behaviours. For instance, CBT interventions may include cognitive restructuring through thought identification, monitoring and challenging, alongside a behavioural element which can include behaviour activation, activity scheduling, graded exposure tasks and emotional management strategies, such as relaxation and problem-solving

skills training (Hofmann, 2011). Over the years, CBT has been considered the gold standard treatment of choice for emotional problems of anxiety and depression (David et al., 2018; Kendall et al., 2012), with a large amount of research confirming its efficacy. For instance, meta-analyses during the 1980s (Dobson, 1989), the 1990s (Hollon, Shelton, & Loosen, 1991; Gloaguen, Cottraux, Cucherat et al., 1998), the 2000s (Butler et al., 2006; Cuijers, van Straten, Andersson et al., 2008), the 2010s (Cristea et al., 2017; Hofmann et al., 2012; Grist, Croker, Denne et al., 2019) and 2020's (Riise, Wergeland, Njardvik et al., 2020) have found substantial support for the efficacy of CBT over time.

One of the first CBT programmes for the prevention and intervention of childhood anxiety was the “Coping Cat” programme, originated from HIC of US (Kendall, Kane, Howard et al., 1990; Kendall, 1994) which was subsequently updated in a 16-week manual-based CBT treatment (Kendall & Hedtke, 2006). The Coping Cat programme has demonstrated efficacy in RCTs across cultures and settings (Keehn, Lincoln, Brown et al., 2013; Smith, McLeod, South-Gerow et al., 2017; van Starrenburg, Kuijpers, Kleinjan et al., 2017) and has also been found to be effective in the maintenance of treatment gains over time (Kendall, Safford, Flannery-Schroeder et al., 2004; Wolk, Kendall & Beidas, 2015).

Adapted from the “Coping Cat” programme (Kendall, 1994), the “Friends For Life” programme (Barrett, 2004) originating from HIC of Australia, was developed as an anxiety prevention programme that integrated cognitive behavioural approach with social and emotional learning. This evidence-based programme was endorsed by the WHO (2004) for its efficacy in the prevention of anxiety in children and adolescents. The “Friends For Life” programme utilizes CBT techniques to promote emotional resilience in young people. It uses behavioural, physiological, and cognitive strategies to teach children practical skills to identify their feelings and emotions, to learn to relax, to identify unhelpful thoughts, and how to face and overcome challenges in daily life. Effectiveness studies across different countries

have provided evidence for its efficacy in decreasing symptoms of emotional problems, not only immediately after completion of the programme, but also at long-term follow-up (Ahmarian, Khodabakhsh-Koolae, Taghvaei et al., 2020; Essau, Conradt, Sasagawa et al., 2012; Kusters, Chinapaw, Zwaanswijk et al., 2012; Lizuka, Barrett, Gillies et al., 2015; Waldron, Stallard, Grist et al., 2018). Studies have also evidenced the programme in helping build resilience, increases awareness of anxiety, and also allows teachers and parents to meet the mental health needs of young people. This intervention has been successfully adapted for use in numerous languages and across targeted and even indigenous populations (WHO, 2004; Liddle & Macmillan, 2010).

Around the same emergence time of the above two programmes, the “Cool Kids” programme, also originating from Australia was developed. This programme uses a CBT-based approach for the prevention of anxiety in young people (Rapee, Lyneham, Schniering et al., 2006). It is an evidence-based intervention with structured 10-sessions for the treatment of anxiety in children that also involve parents. A systematic review indicated that youth receiving the Cool Kids intervention has superior improvement in anxiety outcomes as compared to controls (Mychailyszyn, 2017) and this finding has been confirmed in several RCTs (Arendt, Hougaard & Thastum, 2016; Chronis-Tuscano, Novick, Danko et al., 2021; Hudson et al., 2013; Kapci, Uslu, Sukhodolsky et al., 2012).

A first limitation of the above CBT programmes is their relatively low effect sizes (Haugland, Haaland, Baste et al., 2020; Higgins & O’Sullivan, 2015; Lenz, 2015). In fact, a recent systematic analysis concluded that CBT-based programmes are no more effective than non-CBT active control or treatment-as-usual groups where only about 50% of the children and adolescents responded to CBT treatment (James, Reardon, Soler et al., 2020). Examining the temporal changes (time trends) in the treatment effects of CBT, a meta-analysis (Johnsen & Friborg, 2015) has found a declining treatment effect of CBT across time, with

contemporary CBT treatments showing a lower efficacy than some of the therapies used decades ago. Weak to none CBT effects have also been reported for youth depression and anxiety (Ale, McCarthy, Rothschild et al., 2015; Southam-Gerow, Weisz, Chu et al., 2010; Weisz, Kuppens, Ng et al., 2017).

A second limitation of the above CBT-based programmes is that they have a common disadvantage of being diagnostic-specific interventions and they tend to rely on a categorical approach such as the DSM-5 to determine whether the individual meets the diagnostic criteria of a particular disorder. These treatment interventions tend to focus on disorder-specific symptomatology, while other comorbid diagnoses do not receive sufficient attention (McManus, Shafran & Cooper, 2010). Many children and adolescents have subthreshold symptoms, i.e., symptoms below the clinical range and that do not meet all the criteria for a disorder. The prevalence of subthreshold anxiety may affect up to 32% of the youth population (Balazs, Miklosi, Keresztesy et al., 2013). However, disorder-specific intervention protocols frequently do not target subthreshold symptoms that did not meet diagnostic thresholds for one disorder or another and this is imperative to be addressed in a treatment (Barlow, Allen, & Choate, 2016). One major potential reason for this decline in therapy effect may relate to the fact that the CBT approach used to treat emotional problems of anxiety and depression has typically been disorder-specific, that is, the specific CBT has focused on treating one disorder at a time without paying therapeutic attention to comorbid conditions.

As discussed in Chapter 2, comorbidity is a clear threat to the efficacy and effectiveness of diagnosis-specific CBT. Within disorder-specific interventions for anxiety and depression, individuals with comorbid anxiety and depression are often traditionally excluded (Ehrenreich-May, Bilek, Queen et al., 2012). In some studies, diagnosis-specific treatments have shown post-treatment reductions in additional comorbid anxiety or

depression that were not specifically addressed, however, these outcomes were found to not be durable and consistent (Norton & Philipp, 2008). Likewise, the efficacy of CBT protocols for specific anxiety or depression in youth seem to be weaker when comorbid depression or anxiety, respectively, is present (Ehrenreich-May et al., 2012). Most adolescents treated with disorder-specific CBT have experienced symptom recurrence and slower response to the specific intervention. For example, poorer intervention responses were found in youth with anxiety (Ginsburg, Becker, Keeton et al., 2014) and depression (Cummings et al., 2013). Hence, with emotional problems of anxiety and depression, comorbidity is more the norm than the exception, and this represents a major limitation to diagnosis-specific CBT. There is an urgent need to refine current CBT approaches to the prevention and treatment of childhood and adolescence to acknowledge comorbid anxiety and depression.

5.3.1. Transdiagnostic CBT (tCBT)

Given that disorder-specific CBT approaches to anxiety or depression tend to focus on its specific symptom reduction, they do not target the shared pathology that plays a significant role in the formation and continuity of anxiety and depressive symptoms (Norton & Barrera, 2012). In contrast while addressing these limitations, transdiagnostic CBT (tCBT) for emotional problems has emerged as a new therapeutic approach that targets psychopathological processes common to both anxiety and depression. It refers to a family of interventions that combine a variety of approaches, such as cognitive, behavioural, and emotion-focused techniques (Hofmann et al., 2012). Hence, in general, transdiagnostic approaches offer an integrated model of treatment that explicitly targets shared transdiagnostic processes in therapy in order to facilitate change across several diagnoses. That is, treatment protocols of tCBT target the core underlying mechanisms (i.e. automatic thoughts, core beliefs, avoidance) that maintain the symptoms across different emotional

disorders and include efficacious CBT techniques found in traditional disorder-specific CBT protocols. It is thus conceptualised as a therapeutic intervention inclusive of broad symptomatology (Barlow, Farchione, Sauer-Zavala et al., 2017; Norton, 2012a; McManus, Shafran, & Cooper, 2010).

The efficacy of a transdiagnostic approach is underpinned by substantial empirical support demonstrated in literature reviews (e.g. Craske, 2012; McEvoy, Nathan, & Norton, 2009), clinical trials (e.g. Barlow et al., 2017; Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010; Gros, 2014; Harris & Norton, 2019) and meta-analytic reviews (e.g. Garcia-Escalera, Chorot, Rosa et al., 2016; Newby, McKinnon, Kuyken, Gilbody, & Dalgleish, 2015; Pearl & Norton, 2017). Clinical trials have demonstrated strong treatment tCBT effects. For example, compared to control groups, moderate to large effects on anxiety and depression have been found, and these effects have remained consistent at follow-up (Norton & Philipp, 2008; Reinholt & Krogh, 2014). A meta-analysis by Newby et al. (2015) found that transdiagnostic interventions not only had a large treatment effect on anxiety and depression but also on quality of life. Moderate increases in quality of life ratings demonstrated the positive impact of transdiagnostic interventions on improving quality of life. Hence, mounting evidence suggests that tCBT is an evidence-based approach to the treatment of emotional problems, regardless of high rates of comorbidity (Farchione et al., 2012; Norton et al., 2013; Pearl & Norton, 2017).

5.3.2. tCBT intervention programmes

Early intervention programmes are necessary and beneficial for children and adolescents as they help to prevent the development of emotional disorders such as anxiety and depression. Effective intervention efforts will not only help reduce the likelihood of anxious and/or depressive symptoms in young people, but they will also promote healthy

functioning. Numerous evidence-based transdiagnostic intervention programmes have been transported and culturally adapted from HICs to resource-limited LMICs (Yatham et al., 2017). However, evidence-based research to guide such a process is limited, with only 3-5% of published research on youth transdiagnostic programmes emanating from LMICs (Patel & Sumathipala, 2001; Saxena, Paraje, Sharan et al., 2006). A strategic framework model composed of key elements of training, supervision, leadership and service evaluation on a long-term duration may help meet the mental health treatment gap among youths in LMICs (Beck, Nadkarni, Calam et al., 2015). A systematic review of the effectiveness of tCBT-based interventions for young people in LMICs has evidenced the successful implementation of evidence-based interventions in LMICs which were adapted from HICs (Barry, Clarke, Jenkins et al., 2013). This evidence highlights the potential of such interventions when adapted to meet the cultural needs of young people in LMICs.

Contemporary tCBT interventions are increasingly placing an emphasis on the role that emotion dysregulation plays in the development and maintenance of emotional problems (Gross & Jazaieri, 2014; Hofmann, Sawyer, Fang, & Asnaani, 2012; Tracy, Klonsky, & Proudfit, 2014). As such, ER is now a focal point of newer, emotion-focused versions of transdiagnostic programmes and is being embedded across several tCBT treatment modalities given its evidence as a putative mechanism of change in the therapy process (Barlow et al., 2010; Mennin & Fresco, 2013; Watkins, Mullan, Wingrove et al., 2011). In a recent systematic review analysing the involvement of ER across intervention modalities and disorder presentations, ER emerged as an important construct both in the expression and treatment of psychopathology (Sloan, Hall, Moulding et al., 2017). Hence, distinct tCBT treatments for a number of different emotional disorders, that do not directly target ER, can in fact produce meaningful change in this construct and more likely to produce clinical change in psychopathology symptoms. Overall, emotion regulation can be viewed as a translational

framework in the transdiagnostic CBT-based therapy process, that is, interventions improving ER along with emotional problems can be promoted in real-life contexts to promote treatment and intervention.

Despite the potential benefits of transdiagnostic preventive interventions, there are only three transdiagnostic theory-driven CBT protocols to prevent emotional problems of anxiety and depression. These tCBT were developed and preliminarily evaluated for young children: (a) the Unified Protocols for Transdiagnostic Treatment of Emotional Disorders in Children and Adolescents (UP-C and UP-A; Ehrenreich-May, Kennedy, Sherman et al., 2018); (b) EMOTION: “Coping Kids” Managing Anxiety and Depression (Kendall, Stark, Martinsen, O’Neil, & Arora, 2013) and (c) Super Skills for Life (Essau & Ollendick, 2013).

Firstly, the Unified Protocols for the Transdiagnostic Treatment of Emotional Disorders for children and adolescents (UP-C; UP-A; Ehrenreich-May et al., 2018) are a downward extension of the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP; Barlow, Farchione, Bullis et al., 2017). This tCBT programme focuses on addressing core emotion dysregulation such as negative affect and emotional difficulties. The UP targets commonalities between emotional disorders by seeking to improve specific areas of emotional functioning, such as increasing mindful awareness (i.e., non-judgmental acceptance) of emotional experiences, enhancing cognitive flexibility (i.e., cognitive appraisal and reappraisal), and identifying and reducing patterns of emotional and behavioural avoidance (Barlow et al., 2017). Studies investigating the effects of the UP programme have found evidence for its effectiveness on treating anxiety, depression and a variety of emotional difficulties (Barlow et al., 2017; Farchione et al., 2012), across children and adolescents (Ehrenreich-May et al., 2018; Kennedy, Bilek, & Ehrenreich-May, 2018), and with positive outcomes consistently maintained over time (Bullis, Fortune, Farchione et al., 2014). Furthermore, it has been adapted for use in different cultural settings across HICs

and LMICs, such as Colombia (Ametaj et al., 2018), Japan (Ito et al., 2016), Spain (Castellano, Osma, Crespo et al., 2015) and Brazil (de Ornelas Maia, Nardi, & Cardoso, 2015). A recent meta-analysis of the UP (Sakiris & Berle, 2019) found large effect sizes for comorbid symptoms of anxiety and depression when UP was delivered in both individual and group formats with significant improvements in functional impairment and quality of life.

However, the studies implementing the UP programme are limited to participants who met the diagnostic criteria for an internalising disorder, thereby questioning the generalisability of the findings as to whether similar outcomes would be achieved with sub-clinical populations. Adults seem to benefit more from UP treatments than children and adolescents despite protocol adaptations (Carlucci, Saggino & Balsamo, 2021). The parental component in the UP-A may contribute to a lack of significant effects (Garcia-Escalera, Valiente, Sandin et al., 2020), especially when family factors are strongly associated with emotional problems (Toumbourou, Thomas, Catalano et al., 2005). Children and adolescents experience difficulties in communicating distress or negative emotions and parents of these children could inadvertently reinforce these intense negative emotions, and ultimately increase the use of dysfunctional coping strategies (Ehrenreich-May et al., 2018).

Secondly, the evidence-based programme, the EMOTION “Coping Kids” Managing Anxiety and Depression (Kendall, Stark, Martinsen et al., 2013), is a transdiagnostic intervention aimed at reducing anxiety and depressive symptoms in children and adolescents, and the likelihood of them being at risk for developing emotional disorders. Specifically, this programme targets internalizing symptoms and focuses on improving children’s emotional regulation skills, psychoeducation, behavioural activation, cognitive restructuring, building of a problem hierarchy, and gradual exposure to feared or avoided situations (Barlow et al., 2010; Martinsen, Kendall, Stark et al., 2014). The EMOTION programme seems to be suitable for studying potential changes in the underlying mechanism of emotion regulation.

This transdiagnostic programme has shown the potential for both short-term and long-term reductions in anxiety and depressive symptoms in children (Martinsen, Rasmussen, Wentzel-Larsen et al., 2018; Loevaas, Lydersen, Sund et al., 2020). Moreover, the EMOTION intervention has been found to be effective in improving children's general emotion regulation capacity and to create lasting improvements in children's strategies for managing anxiety (Loevaas, Sund, Lydersen et al., 2019). However, the treatment effects of the EMOTION programme are relatively small, in line with similar prevention programmes such as Friends for Life (Loevaas et al., 2020). Researchers suggest that there is room for further studies using the EMOTION programme given that it is still at a nascent stage and that there are uncertain results as to the effect of EMOTION on transdiagnostic treatment such as depressive symptoms.

5.3.3. Super Skills for Life Intervention Programme

The evidence-based intervention programme, Super Skills for Life (SSL; Essau & Ollendick, 2013) for emotional problems among children and adolescents seem to address the limitations of the above two tCBT programmes. Firstly, the SSL does not use any structured diagnostic interviews to assess eligibility of a participant, as it is based on referrals from staff/teachers of children who they think would benefit from the intervention. Secondly, the SSL gets closer to a universal indicated prevention approach in reaching children and adolescents who would otherwise fall below subthreshold levels. In fact, this intervention is considered to be a resilience-building programme that is based on CBT principles for the treatment of anxiety and its comorbid problems such as depression, low self-esteem and poor social skills. Thirdly, the SSL is the first CBT-based protocol that integrates social skills training, behavioural activation and video-feedback with cognitive preparation as part of the intervention programme (Essau et al., 2014).

More precisely, the SSL intervention protocol targets emotional difficulties such as anxiety and depression in children and adolescents through 8 sessions of manualised CBT. The SSL is unique such that it has five core principles: (1) it is based on a transdiagnostic approach to emotional problems by targeting common risk factors (e.g. low self-esteem, poor social skills of emotional and behavioural problems (Rohde, 2012); (2) it is based on the principles of CBT to help children develop skills to cope with challenging or anxiety-provoking situations; (3) it uses video-feedback with cognitive preparation to help children enhance their self-perception (Harvey et al., 2000). For instance, during the intervention period, children are asked to do 2-min speeches facing a video camera on 3 occasions (first session, last session and the follow-up session); (4) it uses the principle of behavioural activation by encouraging participation in different positive and rewarding activities aiming to improve children's social skills and overall self-esteem; (5) and it actively teaches children basic skills to cope with stressful situations and makes use of relaxation techniques. The SSL is also able to investigate the impact of treatment as related to emotion regulation and executive function, that is, it can examine the extent to which social, emotional and cognitive development can be influenced as a result of SSL.

Importantly, the SSL is intended to help children deal with emotional difficulties, while aiming to reduce the likelihood of developing anxiety and/or depressive disorders. The SSL delivers a range of skills and strategies that are relevant for transdiagnostic prevention of emotional problems of anxiety and depression. As mentioned above, it specifically targets shared vulnerabilities and risk factors; for example, withdrawal/avoidance behaviours being addressed through social skills training and behavioural activation, maladaptive thoughts and negative automated cognitive processing through cognitive restructuring and self-monitoring, and stress impact and adaptive coping addressed through problem-solving skills training and relaxation techniques. Hence, the SSL is the first transdiagnostic intervention that consists of

a wider integration of not only CBT techniques such as behavioural activation, social skills training and video-feedback with cognitive preparation, but it also incorporates a set of skills and strategies such as psychoeducation, emotional awareness, cognitive restructuring, problem-solving, self-monitoring and training in relaxation and social competence to help children combat emotional problems and build emotional resilience, all part of the treatment (Essau et al., 2014).

In the pioneering SSL studies in the UK, the intervention was found to be not only effective in reducing anxiety and depressive symptoms, (Essau et al., 2014; 2019), but also in decreasing transdiagnostic behavioural difficulties such as hyperactivity and peer problems and improving self-esteem and social competence post intervention and at follow-up (Essau et al., 2014). Interestingly, the SSL was found to reduce the transdiagnostic emotional problems in children and behavioural symptoms in children, even though the programme was not designed to target these behavioural issues. Following the evidence of the positive impact of the SSL in reducing emotional problems of young people, the SSL has been translated, culturally adapted and validated in several high-income countries in Europe (such as Germany, Cyprus, Greece, Portugal, Poland, Spain) and in middle-income countries (such as Turkey and Malaysia). The SSL has two versions, one for children (SSL-C) and one for adolescents (SSL-A) and the intervention modalities can be group-based or individual-based. Recent SSL studies have been carried out among children (SSL-C) and adolescents (SSL-A), implemented in different countries and different settings (such as school settings, pupil referral units, clinical settings, juvenile homes) while using different methodologies (group or individual format; implemented by mental health professionals, staff or teachers). Table provides details on the SSL studies which have examined the efficacy of the SSL intervention on primary and secondary outcome variables related to emotional problems. Altogether, the SSL research indicates positive effects of the intervention on emotional problems and

comorbid factors such as behavioural difficulties and psychosocial impairments in both the short-term (post-SSL intervention) and the long-term (up to 12 months after the SSL intervention) (see Table 14).

Overall, the SSL is the most widely used transdiagnostic treatment interventions that also targets comorbid symptoms to emotional problems, and it has proved efficacious in treating emotional problems and helping build skills and emotional resilience in children and adolescents. Importantly, transdiagnostic CBT-based psychological treatments target shared underlying mechanisms across all emotional problems and thereby offer a single treatment that can be implemented across the common clinical representations. Given the unmet demand for youth mental health care in LMICs, combined with the lack of clinicians trained in evidence-based treatments, the transdiagnostic indicated prevention such as the SSL can be researched for its potentiality to improve the potential future of youth mental health care in LMICs, as it represents one of the best approaches to increasing access to evidence-based care and impacting youth mental health.

Table 14.

Studies examining outcome variables following the SSL intervention

Study	Sample	Groups & Assignment	Change in Primary Outcomes	Change in Secondary Outcomes	Comments
1. Essau, Olaya, Sasagawa et al., 2014	8 – 10 years (70.49% male) Primary school children were recruited from 4 regular schools in UK	Children were referred by teachers as displaying emotional problems; open clinical trial study ($n = 61$); pre-test, post-test and 6-months follow-up	Reduction in anxiety symptoms (generalised anxiety, social phobia and separation anxiety) at post-intervention and follow-up	Positive effects on hyperactivity, conduct and peer problems at follow-up; improved behavioural indicators of anxiety at follow-up	SSL-C; Open clinical trial; small sample size; no control group
2. Essau, Sasagawa, Jones et al., 2019	8 – 12 years (48.29% male) Primary school children were recruited from 27 regular schools in UK	Children were referred by teachers as displaying emotional problems; open clinical trial study ($n = 205$); pre-test, post-test and	Reduction in total anxiety and generalised anxiety at post-intervention; reduction in total anxiety, separation anxiety, generalised anxiety, panic at follow-up	Gender difference: on self-reports, girls reported higher anxiety, overall emotional and peer problems and prosocial behaviour than boys; based on teaches' report, boys reported higher	SSL-C; Open clinical trial; no control group

		6-months follow-up		hyperactivity and lower prosocial behaviour Improvement in behavioural assessment of anxiety (eye gaze, vocal quality, speech, manifestation of comfort, and conversational flow) at post-intervention		
3.	Orgilés, Fernández-Martínez, Espada et al., 2019	8 – 12 years (57.1% male) Primary school children were recruited from 9 regular schools in Spain	Children were selected based on SDQ-P emotional symptoms subscale scores (scores ≥ 4); quasi-experimental study ($n = 119$); pre-test, post-test and 12-months follow-up	Reductions in symptoms of SDQ emotional problems, generalized and separation anxiety, depression, negative self-esteem and dysphoria at post-intervention and at 12-months follow-up (except for generalised anxiety)	Reductions in symptoms of interference of anxiety with children's life, including both inside and outside the home and SDQ total difficulties symptoms	SSL-C; Quasi-experimental design; no control group
4.	Fernández-Martínez, Morales,	6 – 8 years (55.3% male)	Children were selected based on SDQ-P	Reductions in symptoms of depression, overall anxiety,	Reduction in physical injury fears,	SSL-C; Cluster randomised-controlled trial design; small sample;

	Espada et al., 2019	Primary school children were recruited from 10 regular schools in Spain	emotional symptoms subscale scores (scores ≥ 4 categorised as borderline/abnormal); randomised-controlled trial ($n = 123$); pre-test and post-test	social anxiety, and SDQ emotional problems (i.e., both anxiety and depression)	interference of anxiety at home	only parent-report measures of emotional problems were used
5.	Fernández-Martínez, Orgilés, Morales et al., 2020	6 – 8 years (55.3% male) Primary school children were recruited from 10 regular schools in Spain	Children were selected based on SDQ-P emotional symptoms subscale scores (scores ≥ 4 categorised as borderline/abnormal); randomised waitlist-controlled trial design ($n = 123$); pre-test and 1-year follow-up	Reductions in symptoms of depression, overall anxiety, social anxiety, panic and SDQ emotional problems (i.e., both anxiety and depression) and total difficulties at 1-year follow-up	Reduction in overall child-anxiety related-interference of anxiety at home and outside home and parent life interference at 1-year follow-up	SSL-C; Cluster randomised waitlist-controlled trial design; small sample; only parent-report measures of emotional problems were used
6.	Orgilés, Melero,	8 – 11 years (68.4% male)	As part of SSL, children	Improvements	Improvements in social performance	SSL-C; Small sample size;

Fernández-Martínez, et al., 2020a	Primary school children were recruited from 9 regular schools in Spain	participated in 2-min video-speech pre- and post-treatment; children were assessed for improvements in social performance through video-feedback ($n = 57$)	in children's social performance, prosocial behaviours and communication skills at post-SSL treatment; reduction in children's behavioural signs of anxiety in social situations at post-SSL treatment	was greater for boys than girls at post-SSL ; social self-concept mediated the effects of SSL on social anxiety symptoms	no control group
7. Orgilés, Garrigós, Espada, et al., 2020b	8 – 12 years (60.5% male) Primary school children were recruited from 9 regular schools in Spain	Children were selected based on: (a) SDQ emotional symptoms subscale scores (scores ≥ 4 categorised as borderline/abnormal); (b) SCARED Separation Anxiety subscale (cut-off scores ≥ 5); quasi-experimental design ($n = 86$);	Reductions in symptoms of separation anxiety at post-SSL intervention and 12-month follow-up	Reduction in symptoms of depression, dysphoria and SDQ's subscale of emotional problems, internalising problems and total difficulties at post-SSL intervention and 12-month follow-up; improved scores on academic and physical measures of self-concept at post-SSL intervention and 12-month follow-up;	SSL-C; Quasi-experimental design; small sample; no control group

		pre-test, post-test and 12-months follow-up		improvements not observed in variables at post-test were significant at 12-month SSL follow-up (negative self-esteem, externalizing, behavioural and peer problems, and social and emotional self-concept)	
8. Fernández-Martínez, Morales, Espada, et al., 2020	6 – 8 years (68.4% male) Primary school children, recruited from 10 regular schools in Spain	As part of SSL, children participated in 2-min video-speech pre- and post-treatment; children were assessed for improvements in social skills through video-feedback (<i>n</i> = 67)	Improvements in children's behavioural social performance scores related to gaze, vocal quality, length of speech, discomfort, conversation flow, behavioural assessment of social performance (total SPRS), micro-behaviours, nervous behaviours and overall global impression during the speech at post-SSL intervention	Depression acted as a mediator of change in pre- to post-intervention scores of generalized anxiety symptoms	SSL-C; Small sample size; no control group

9. Orgilés, Espada & Morales, 2020c	<p>$M = 43.5$ years ($SD = 5.14$) (17.7% male)</p> <p>Parents of children aged between 6 to 12 years were recruited through social networks (Facebook and Twitter)</p>	<p>Parents of children who received the SSL program before COVID-19 home confinement ($n = 48$) were compared with an equivalent control sample of children who did not attend the program ($n = 48$); parents completed measures assessing their children's immediate psychological reactions to confinement and their coping styles ($n = 96$)</p>	<p>The control group reported higher symptoms of anxiety, mood problems, sleep problems, cognitive alterations and more use of emotion-oriented strategies during confinement as compared to the SSL intervention group</p>	<p>SSL-C; Online survey; Small sample size;</p>	
10. de la Torre-Luque, Fiol-Veny, Essau et al., 2020	<p>$M = 13.76$ years ($SD = 0.32$) (45.3% male)</p>	<p>Adolescents were selected based on: (a) anxiety symptoms</p>	<p>SSL-A changed the natural course of anxiety symptoms with significant reduction in social</p>	<p>Improvements in adolescents' behavioural social performance related</p>	<p>SSL-A; experimental design with 3 groups (intervention, placebo and waitlist-control); small</p>

	Secondary school adolescents were recruited from regular schools in Majorca island, Spain	(RCADS) and temperament (EATQ-R); (b) MINI-kid screening for anxiety disorders; a randomised control trial design ($n = 61$) to intervention, placebo and waitlist groups; pre-test (assessment done twice before the intervention with an interval of 6 months), post-test and 6-months follow-up	phobia and generalised anxiety symptoms at 6-months follow-up for the SSL intervention group	to vocal quality and lower discomfort at post-SSL intervention; improvement in physiological (cardiac) function during the stressful speech tasks	sample; high drop-out rate in the placebo group
11. Melero, Morales, Espada, et al., 2021	8 – 11 years (58.6% male) Primary school children were recruited from 28	Children were selected based on the SDQ-P emotional symptoms subscale scores (scores ≥ 4	Improvements in children's behavioural social performance on all outcomes of SPRS (gaze, vocal quality, length of speech, discomfort, conversation flow, total	The impact of the SSL program seemed greater for boys on gaze-related variables at post-test; improvements in discomfort, total	SSL-C implemented in one-to-one format; Small sample size; no control group

	regular schools in Spain	categorised as borderline/abnormal). As part of SSL, children participated in 2-min video-speech pre- and post-treatment; children were assessed for improvements in social skills through video-feedback ($n = 70$)	SPRS, and OPQ-C outcomes of micro-behaviours, nervous behaviours and overall global impression at post-SSL intervention	social performance and speech adequacy was greater for girls	
12. Allan, Uzun & Essau, 2021	11 – 14 years (59.8% male) Secondary school adolescents were recruited from a mainstream school ($n = 1$) and a pupil referral unit ($n = 1$) in UK	Adolescents were referred by teachers as having internalizing and externalizing problems; a randomised waitlist-controlled trial design ($n = 112$); pre-test, post-test and 6 months follow-up	Reductions in symptoms of total internalizing problems and subscales of somatic complaints, withdrawn and anxious/depressed symptoms from pre-test to follow-up assessments; reduction in symptoms of total externalizing problems and subscale of aggressive behaviour from	Gender, age and school setting moderated the SSL intervention outcome; that is, males, younger adolescents and adolescents from mainstream schools showed a significant reduction over time on both internalizing	SSL-A; a randomised waitlist-controlled trial design; small sample size

			pre-test to follow-up assessments	and externalizing problems	
13. Melero, Orgilés, Fernández-Martínez, et al., 2021a	8 – 12 years (57.1% male) Primary school children were recruited from 9 regular public and private schools in Spain	Children were selected based on SDQ-P emotional symptoms subscale scores (scores ≥ 4 categorised as borderline/abnormal); a quasi-experimental design ($n = 119$); pre-test, post-test and 12-months follow-up; the sample was divided into two groups: high fidelity group (HFG) ($n = 32$) and low fidelity group (LFG) ($n = 87$), according to the degree of fidelity with	High implementation fidelity of the SSL with high adherence and acceptance; at post-test, HFG presented lower depression, anxiety, total difficulties, and externalizing symptoms, and higher academic and family self-concept than LFG; at follow-up, LFG presented higher depression, total difficulties, and internalizing symptoms, and lower academic, social, and family self-concept.	All post-test self-concept dimensions had a significant impact at follow-up on internalizing symptoms. Academic, social and physical self-concept dimensions impacted externalizing symptoms.	SSL-C; quasi-experimental design; small sample; implementation fidelity measured by self-reports only; lack of randomisation

		which the intervention was implemented			
14. Melero, Orgilés, Espada et al., 2021b	8 – 11 years (58.6% male) Parents and school-children were recruited through (a) 28 public, private, and charter schools (b) and through social networks in Spain	Children were selected based on SDQ-P emotional symptoms subscale scores (scores ≥ 4 categorised as borderline/abnormal); a quasi-experimental and intragroup design ($n = 70$); participants received the SSL intervention in an individual format; parents of participating children completed pre-test and post-test assessments	Reduction in symptoms of depression, overall anxiety, separation anxiety, social phobia, panic attack/agoraphobia, generalized anxiety, and anxiety interference at home, total SDQ-P difficulties, internalized and externalized problems, emotional symptoms, peer problems, and hyperactivity/inattention at post-SSL intervention	Parents observed improvements in all variables evaluating their children's emotional state; both boys and girls obtained lower scores on all variables of emotional symptoms and higher scores on prosocial behaviour in the post-SSL intervention	SSL-C implemented in individual format; an open clinical trial; no control group; small sample size

15. Melero, Morales, Espada et al., 2021c	8 – 12 years (65% male) Primary school children were recruited from 37 public, private, and charter schools in Spain	Children were: (a) referred online by parents as having emotional symptoms and (b) selected based on the SDQ-P emotional symptoms subscale scores (scores ≥ 4 categorised as borderline/abnormal; children ($n = 140$) received the SSL in two treatment modalities (group format and individual format); pre-test, post-test and 1-year follow-up	Both modalities were effective in enhancing social relationships in children, however children in individual modality group presented fewer peer problems (less social isolation and rejection, greater social acceptance, more friends) and greater prosocial behaviours (helping, empathy, kindness, and sharing) compared to children in group modality, both at post-SSL and 1-year after SSL intervention	SSL-C implemented in both group and individual formats; small sample size	
16. Zakaria, Sasagawa & Essau., 2021	13 – 19 years (68.5% male) Adolescents recruited from 8	Children were referred by their teachers as displaying high levels of anxiety	Reductions in symptoms of emotional problems and increase in prosocial behaviour after the SSL-A intervention.	Adolescents reported less substance use and less use of maladaptive emotion regulation strategies	Open clinical trial design; small sample size; 6-month follow-up assessments could not be carried out

juvenile homes and reform schools across Malaysia	and depression and problematic substance use; (<i>n</i> = 108)	following the SSL-A intervention. Females compared to males showed more treatment gains (i.e., reduction in loneliness and improvement in psychological health and self-esteem) after the SSL-A intervention	due to school closure following COVID-19
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Note. SDQ-P = Strengths and Difficulties Questionnaire – Parent version (Goodman, 1997); SDQ = Strengths and Difficulties Questionnaire – child version (Goodman, 1997); SSL-C = Super Skills for Life programme for children (Essau and Ollendick, 2013); SSL-A = Super Skills for Life programme for adolescents (Essau and Ollendick, 2013); SPRS = Social Performance Rating Scale (Fydrich et al., 1998; Essau et al., 2014); EATQ-R = Early Adolescence Temperament Questionnaire, Revised version (Ellis & Rothbart, 2001); MINI-Kid = Mini-International Neuropsychiatric Interview for Children and Adolescents (Sheehan et al., 1998); RCADS = Revised Child Anxiety and Depression Scale (Chorpita et al., 2000)

5.4. The transportability of tCBT

For the proper dissemination and implementation of tCBT interventions, issues of transportability should be addressed in order to maximize the likelihood of adoption, utilization and maintenance (Schoenwald & Hoagwood, 2001; Southam-Gerow et al., 2008). Factors influencing the compatibility of a treatment include the degree to which it meets perceptions of how the therapy works, the infrastructure and existing practices of the provider setting, the intervention's fit to the needs of the targeted population, and the ability of an intervention to be modified while maintaining the core principles of treatment. Additionally, compatibility is likely enhanced by tCBT treatments that may be administered in settings with which children are familiar, such as schools, community settings and residential care institutions. Importantly, a tCBT treatment should be able to adapt to the constraints of a particular setting, as well as best serve the population within that setting.

5.4.1. tCBT interventions in school settings

School settings provide a forum for promoting not only academic learning, but also emotional and social competence, and they offer a convenient location to deliver interventions to improve mental health (Fazel et al., 2014b; Kern et al., 2017; Patel et al., 2013). Schools offer a unique natural environment for supporting children and young people, in developing good mental health and resilience, in preventing emotional problems, and in supporting the effective treatment of existing conditions. Schools are increasingly being recognised as ideal settings for implementing and evaluating youth mental health programmes. Over the years, numerous systematic reviews and meta-analyses have investigated the effectiveness of school-based mental health interventions at both the universal (delivered to all students irrespective of perceived need) and targeted (delivered to

vulnerable or ‘high risk’ students only) levels. Overall, research findings indicate mixed results regarding the efficacy of CBT-based interventions in school settings.

On one hand, evidence from HICs has suggested that school-based CBT programmes that start at an early age to address emotional and behavioural problems, and promote early life skills and social and emotional learning, display long-term benefits for children and adolescents who experience improved emotional and social functioning, positive health behaviours, and improved academic performance (Fazel, Hoagwood, Stephan et al., 2014a; Wells, Barlow & Stewart-Brown, 2003; Tennant, Goens, Barlow et al., 2007). Moreover, CBT-based programmes in schools have been found to be effective in alleviating anxiety and depressive symptoms and severity, reducing cognitive biases, and improving overall functioning (Bernstein et al., 2008; Masia-Warner et al., 2005; Neil & Christensen, 2009). Evidence of school-based tCBT has also emerged in the treatment of ethnically diverse and socioeconomically disadvantaged populations (Bennett, Flett & Babbage, 2016; Ginsburg, Lee & Boyd, 2008; Graham, Sorenson & Hayes-Skelton, 2013). However, despite universal school-based interventions in HICs showing improved social, emotional and educational outcomes in school settings (Merry, Hetrick, Cox et al., 2011; Tennant et al., 2007; Weare & Nind, 2011), the effect sizes of these positive outcomes tend to be small (Corrieri, Heider, Conrad et al., 2014; MacKenzie & Williams, 2018). This evidence of a small effect size questions the overall generalisability of school-based interventions in the literature to real-world settings. It is recommended that future research takes a more holistic approach to wellbeing by including wellbeing and resilience indicators (MacKenzie & Williams, 2018; Reavley, Bassilos, Ryan et al., 2015).

Research on school-based interventions in LMICs is limited with less than 10% of RCTs conducted in LMICs (Skeen, Laurenzi, Gordon et al., 2019). Despite a paucity of evidence, few results suggest that school-based interventions in LMICs can have significant

positive effects on promotion of mental health, students' emotional and behavioural wellbeing and coping skills (Barry, Clarke, Jenkins et al., 2013; Fazel, Patel, Thomas et al., 2014b; Murphy, Abel, Hoover et al., 2017). Moreover, the long-term impact and target population of school-based interventions have been questioned. Despite some immediate postintervention effects of mental health prevention programmes in schools, these effects do not seem to be sustained over time (Kidger, Araya, Donovan et al., 2012; Merry, Hetrick, Cox et al., 2011). A network meta-analysis of interventions to prevent anxiety and depression in young people found insufficient evidence to indicate that school-based interventions are effective in the prevention of emotional problems in children and adolescents (Caldwell et al., 2019). Importantly, the above finding was supported by a recent narrative synthesis that found a lack of evidence for the effectiveness of universal school-based mental health interventions in LMICs (Bradshaw et al., 2021).

A potential reason may relate to the school professionals lacking the necessary training or support needed to implement the CBT-based programmes in LMICs educational settings (Beidas, Barmish, & Kendall, 2009). Indeed, research indicates that school professionals do not routinely receive CBT training and often report low confidence in their ability to deliver CBT-based treatments (Koschmann, Fitzgerald, & Kilbourne, 2017; Nadeem, Gleacher, & Beidas, 2013; Beidas, Mychailyszyn, Edmunds et al., 2012). As overt signs of internalizing problems in young people may be less recognizable than externalizing problems, teachers and parents may often disregard that internalizing problems are significant stressors for children and adolescents (Ginsburg et al., 2008). Moreover, in countries where youth mental health is less spoken about, school professionals, teachers and parents may often be hesitant about involving children in school-based interventions due to fears that the school or the children will be stigmatized, or due to concerns about missed class time (McLoone et al., 2006). Hence, the applicability of school-based mental health interventions

conducted in HICs to LMICs remains unclear. Future research in LMIC of Mauritius should consider the adaptability and feasibility of these interventions for young people, while focusing on raising awareness of mental health problems and reducing the associated stigmatisation.

5.4.2. tCBT interventions in community settings

Community-based interventions emerged on the premise that emotional problems experienced by young people are determined by interactional individual, environmental, familial and parental factors. Community-based mental health approaches focus on the principles of de-stigmatizing internalising problems, promoting positive emotional wellbeing and educating the community to recognise early signs of mental health issues. They also address risk factors in the whole population, target young people who are at risk of emotional problems and provide early intervention or preventive programmes for young people in those communities (Catalano, Berglund, Ryan et al., 2004). The efficacy of CBT-based programmes for youth emotional problems has been demonstrated in several RCT studies conducted in community settings in different countries (Barrington, Prior, Richardson et al., 2005; Bodden, Bogels, Nauta et al., 2008; In-Albon & Schneider, 2007; Lau, Chan, Li et al., 2010; Maaik, Nauta, Scholing et al., 2003; Southam-Gerow, Weisz, Chu et al., 2010; Wergeland, Fjermestad, Marin et al., 2014). Globally, community-based mental health programmes have demonstrated positive effects on youth behavioural changes, self-confidence, self-esteem, levels of knowledge, and physical activity (Das, Salam, Lassi et al., 2016).

Community-based interventions carried out in LMICs vary from family-based strengthening programmes for parents and their children, multidimensional programmes for life, health and recreational skills and combined HIV and mental illness prevention

interventions (Bell, Bhana, Petersen et al., 2008; Brady, Assaad, Ibrahim et al., 2007; Jewkes, Nduna, Levin et al., 2008; Vasquez, Meza, Almandarez et al., 2010). For example, a community-based youth health intervention in India found significant decreases in youths' depressive symptoms and suicidal thoughts, and significantly improved knowledge and attitudes about mental health (Balaji, Andrews, Andrew et al., 2010). Likewise, parent-youth community-based interventions in South Africa and Honduras resulted in significant increases in positive parenting communication and behaviours, parental self-esteem, and family relations (Bell et al., 2008; Vasquez et al., 2010). Moreover, there is increasing evidence for the effectiveness of mental health interventions delivered by non-specialists in community platforms in LMICs (Kohrt, Asher, Bhardwaj et al., 2018).

Collectively, results of these studies indicate the significant positive effect of community-based mental health promotion interventions on young people's emotional and social wellbeing. However, despite being effective within the community, some findings indicate that CBT-based treatments may lose some of their efficacy when transferred to the community (Jonsson, Thastum, Arendt et al., 2015). This may relate to a lack of clarity with regards to models of care at individual, community and policy levels. For instance, implementation approaches may lack structured guidelines and practices for evaluating competency, fidelity and quality of the intervention. There may be poor adherence to treatment in community settings due to mental health stigma in the population. Some community programmes may have high economic costs with limited training and supervision in the programme delivery leading to lack of motivation among non-specialists. Moreover, a lack of screening methods, number of sessions to be carried out and follow-ups of the intervention undermine the fidelity of community-based programmes. Identifying these gaps in practice and knowledge is imperative to improve the effectiveness of community-based strategies.

5.4.3. tCBT interventions in residential care settings

Residential care settings signify a government care system that represent any non-family-based group settings such as places of safety with residential care facilities. These residential care institutions (RCIs) act as safe care for minority-age children and adolescents who have been victims of abuse, neglect or abandonment. Children and adolescents who cannot grow up with their parents for whatever reason are an especially vulnerable group (Fernández-Daza & Fernández-Parra, 2012). Worldwide, there is an increasing number of young people who are being placed in RCIs, which puts the care system in a difficult situation (Petrowski et al., 2017). While deinstitutionalisation has been taking place in many HICs, the situation is alarming in LMICs, with an increasing number of young people being placed in RCIs. RCIs provide different levels of care and individualised attention to children's basic needs (Fernández-Daza & Fernández-Parra, 2012), but they frequently ignore their emotional needs (Eapen, 2009). There is evidence that many residential care providers from HICs have begun implementing specific evidence-based treatments using CBT techniques (James, Thompson, Sternberg et al., 2015; James, Thompson, & Ringle, 2017). With limited research on residential care in LIMCs, a question that arises is whether the vulnerable young group in RCIs are receiving adequate evidence-based psychological treatment in LMICs.

Research evidence indicates that children and adolescents in residential care face more internalizing, externalizing and various mental health problems than children and adolescents living with their own families (e.g. Campos, Barbosa-Ducharne, Dlas et al., 2019; Erol, Simsek, & Munir, 2010; Gearing, Schwalbe, MacKenzie et al., 2014). Despite the high prevalence of emotional problems in RCIs experienced by young people, there are a lack of mental health services and evidence-based programmes for youth in institutional care in

LMICs, which is particularly disconcerting (Chen, Olin, Stirman et al., 2017; James, 2017; Gray, Pence, Ostermann et al., 2015). Psychosocial support services based on tCBT are essential to children and adolescents living in residential care to mitigate against the effects of previous experiences of maltreatment and other traumas such as being removed from family settings and being placed in residential care (Morantz, Cole, Ayaya et al., 2013; Morantz & Heymann, 2010; Meintjes, Moses, Berry et al., 2007; Powell, 2006). However, given the fact that social and cultural factors influence symptom perception and treatment engagement (Bhikha, Farooq, Choudhry et al., 2012), tCBT interventions need to be tailored to the socio-cultural needs of youth in that specific country. Converging evidence indicates a strong benefit to culturally adapting tCBT interventions (Chowdhary, Sikander, Atif et al., 2014; Smith & Griner, 2006; Rathod, Gega, Degnan et al., 2018).

5.4.4. tCBT intervention format

Transdiagnostic treatments, evaluated in randomized controlled trials in either group (e.g., Gros, 2014; Norton & Hope, 2005), individual (Farchione et al., 2012; Schmidt et al., 2012), or computer and/or web-based format (e.g. Kaltenthaler, Parry, & Beverley, 2008; Khanna & Kendall, 2010), have been found to remain efficacious in any format. Equivalent treatment effects have been demonstrated when compared with disorder-specific CBT (Barlow, Farchione, Bullis, et al., 2017; Norton & Barrera, 2012), and when compared with other transdiagnostic treatments (Newby et al., 2015; Pearl & Norton, 2017). However, in order to increase access to treatment in LMICs, several studies have evaluated the effectiveness of CBT-based programmes in group formats (e.g. McMullen & McMullen, 2018; Khanna & Singh, 2019; Gallegos, Linan-Thompson, Stark et al., 2013; Zhao, Yu, Wu et al., 2019), and group-based tCBT has been found to be an efficacious transdiagnostic treatment when compared with waitlist controls. Paulus, Hayes-Skelton, and Norton (2015)

also found that in multicultural societies, ethnic/racial similarities in transdiagnostic groups may have some impact on group cohesion and outcome. Transdiagnostic group treatment is more likely to offer opportunities for normalization, positive peer modelling, reinforcement, social support and exposure to social situations (Masassis, Mendlowitz, Scapillato et al., 2002) and may also be more cost-effective (Flannery-Schroeder, Choudhury, & Kendall, 2005). A more recent systematic review of adolescent mental health interventions (Bradshaw, Gericke, Bronwyne et al., 2021) found that group-based implementation was the most effective mode of intervention delivery in low-resource LMIC settings. Hence, the potentially more cost-effective and less resource intensive group-based tCBT (Hoddinott, Allan, & Avenell, 2010; Tucker & Oei, 2007) could give mental health care providers an opportunity to increase the availability of evidence-based treatment among youth in LMICs.

5.5. Summary

Evidence-based treatments such as traditional CBT have indeed revolutionized the field of mental health. However, increased evidence of the role of emotion dysregulation in the onset, maintenance, and exacerbation of emotional problems such as anxiety and depression have led the research of transdiagnostic programmes to adopt an emotion regulation framework in the treatment model (Aldao et al., 2010; Kring & Sloan, 2009). Moreover, as research has mainly investigated the effect of youth mental health intervention across school and community settings, few have transported tCBT-based programmes in residential care settings despite the high treatment gap for children and adolescents in RCIs. Therefore, a further aim of this project is to transport the established CBT-based transdiagnostic programme, the Super Skills for Life, in RCIs in Mauritius, to examine its feasibility and cultural adaptability in RCIs which are devoid of intervention programmes for young people living there.

Chapter 6:

Study 3: Cultural adaptation, acceptability and feasibility of an intervention programme, Super Skills for Life (SSL), among children and adolescents in Residential Care Institutions of Mauritius

6. Overview

The prevalence study in Chapter 5 indicated a high prevalence of emotional problems among young people in the LMIC of Mauritius. This finding demonstrates that Mauritius is not only an important LMIC for youth mental health research but there are important implications on the design and adaptation of youth mental health intervention. As previously discussed in Chapter 6, most CBT-based intervention programmes are carried out in Western countries, especially with youth in school settings, while young people in residential care remain a neglected population of research for mental health intervention. To improve emotional wellbeing of this vulnerable population who are from diverse cultural and sub-cultural backgrounds, there is a need for cultural adaptation of evidence-based interventions. Hence, this study will specifically aim to examine the cultural adaptation, acceptability and feasibility of the evidence-based intervention programme, Super Skills for Life (SSL), among children and adolescents in living in residential care institutions (RCI) in the multicultural Mauritius.

6.1. Introduction

Globally, a rapid expansion of residential care institutions (RCIs) emerged as a significant response to child protection and welfare of young people. In an attempt to estimate the number of children and adolescents living in such settings, Petrowski and colleagues (2017) reported a global estimate of 2.7 million young people under state residential care. However, this estimate was only based on official government reported data, and noteworthily, official data from low-income countries were practically non-existent. It is important to note that not all countries record the number of young people living in institutions and even if official records are present, access to such data or quality of data are often a great concern (Petrowski et al., 2017, UNICEF, 2009; Williamson & Greenberg, 2010). A recent systematic review of peer-reviewed data from 191 countries across the world indicated that the global estimate of young people living in RCIs was 7.5 million (Desmond, Watt, Saha et al., 2020).

Up to 80% of the world's population of children and adolescents aged between 0 to 17 years have been found to live in the global South, that is, mostly in sub-Saharan Africa and Southern and South-East Asia (Whetten et al., 2009). Importantly, low- and middle-countries within sub-Saharan Africa and South Asia have the highest estimates of numbers of young people living in RCIs (Desmond et al., 2020). The estimates indicate that these countries seem overburdened with the high number of young people in RCIs, and RCIs still constitute the most frequent way of caring for young people without their family or parents (Li, Naar-King, Barnett et al., 2008; Neimetz, 2010; Rygaard, 2010). What is clear is that millions of young people continue to live in RCIs across many LMICs, and without adequate mental health care (Hodgkinson, Godoy, Beers et al., 2017). Such evidence is alarming and has important implications for the mental health of these young people living in RCIs.

Upfront mental health planning in terms of prevention or intervention is therefore of paramount priority for the wellbeing of children and adolescents living in institutional care.

6.2. What are Residential Care Institutions (RCIs)?

The United Nations Convention on the Rights of the Child (UNCRC) postulates that every child has the right to “a standard of living adequate for the child’s physical, mental, spiritual, moral and social development” and requires that parents or legal guardians “have the primary responsibility for the upbringing and development of the child” so as to “secure, within their abilities and financial capabilities, the conditions of living necessary for the child’s development” (United Nations General Assembly, 1989, Article 18 and 27).

However, under many conditions of food, clothing, shelter, health care, education and protection, many parents or legal guardians find themselves unable or unwilling to fulfil these obligations, hence violating the rights of the child by rendering them without proper parental care and protection. Furthermore, young people may be separated from their families following parental death and this may lead them to a loss of parental care and protection. In such situations, the State may intervene to remove the child. The UNCRC stipulates that the State is responsible for ensuring alternative care arrangements in situations where children and young people are “temporarily or permanently deprived of his or her family environment” (United Nations General Assembly, 1989, Article 20).

Acting in the best interest of the child is the fundamental principle that should guide local, national, and international policy, programming, research and care for children in every country. An ‘institution’ for young people can be defined as a group living arrangement of more than ten children, without parents or legal guardians, in which care is provided by a much smaller number of paid adult carers. Residential care implies an organised, routine and impersonal structure to the living arrangements for young people, that is, all children sleep,

eat and carry out daily activities at the same time and there is the presence of a professional relationship, rather than parental relationship, between the caregivers and children (Browne, 2009).

There are differences across RCIs. One unit may differ from another within an institution, and there may even be variability in the care individual children receive within and across institutions (Groark, Muhamedrahimov, Palmov et al., 2005; Gunnar, Bruce & Grotevant., 2000; Smyke, Koga, Johnson et al., 2007). There are certain modal features of institutional care that have characterized these differences in settings across RCIs. These include: generally high child to caregiver ratios; caregivers with low wages; little education or training of caregivers; minimal number of caregivers who work rotating shifts; regimented and non-personalised care of children; and an overall lack of psychological investment in the children (Dozier, Zeanah, Wallin et al., 2012; Zeanah, Nelson, Fox et al., 2003). These institutional care characteristics present challenges to children's development (Nelson, 2007; Zeanah, Smyke & Settles, 2006). For example, inadequate staff-to-child ratios, regular change in caregivers, and limited caregiver interactions with young people in RCIs, have important implications for child well-being (Groark et al., 2005; McCall, van Ijzendoorn, Juffer et al., 2011). Interactions with consistent and committed caregivers can be key to the healthy development of young children in RCIs. For instance, researchers (Groark et al., 2005; Smyke, Dumitrescu & Zeanah, 2002) have found that when certain conditions (i.e., increased caregiver-child interactions) in RCIs were improved, positive changes in child mental health outcomes were noticed. While on the other hand, findings also indicate that even when certain conditions in RCIs were improved (i.e. adequate caregiver-child ratio and adequate cognitive stimulation activities), institutional care still had deleterious effect on young people's development (Gunnar & van Dulmen, 2007; Rutter, Colvert, Kreppner et al., 2007).

Deinstitutionalisation was globally promoted following early evidence from Europe that institutional care was detrimental to the cognitive, behavioural, emotional, and social development of young children (Marcovitch, Goldberg, Gold et al., 1997; O'Connor, Rutter, Beckett et al., 2000; Rutter, 1998). Deinstitutionalization is the process of replacing institutional care for children with care in a family or family-like environment in the community such as community settings or foster care settings. It is the process of preventing the placement of children in institutions and creating new opportunities for children and families to receive support in the community. A recent systematic review found compelling evidence that institutional care is associated with negative developmental outcomes for young people (van Ijzendoorn, Bakermans-Kranenburg, Duschinsky et al., 2020). The results indicated that the negative effects were greatest with regard to the cognitive development and physical growth of young children (including brain growth as indexed by head circumference) and in relation to attention problems (e.g., attention deficit and hyperactivity problems). However, these effects appeared to vary as a function of the type of institutional care, that is, the duration of time spent and the quality of the care. Such findings led to a belief that all RCIs across the world must have the same poor characteristics and are detrimental to young people (Juffer & Series, 2008).

The extent to which RCIs negatively affect children's physical, cognitive, and psychosocial well-being became a central debate affecting many LMICs who have a large number of young people in institutional care (Whetten, Ostermann, Pence et al., 2014; Hynh, 2019). Interestingly, studies carried out in LMICs within broad cultural and situational contexts have found nuanced results. A systematic review (Merz, McCall & Groza, 2013) found that executive functions were lower among infants in institutional care, however this trend was not observed among lower income countries such as Ethiopia, Kenya and Eritrea. Young people in RCIs from Kenya and China reported better psychosocial wellbeing than

their family-based comparisons (Braitstein, Ayaya, Nyandiko et al., 2013; Hong, Li, Fang et al., 2011). One possible explanation for this finding may relate to the fact that the under-resourced countries such as Kenya, Ethiopia and Eritrea have high rates of food insecurity and malnutrition. When children from these countries are institutionalised, their nutritional and health status improve and this may impact in better psychosocial outcomes than their family or community-based comparisons (Braitstein et al., 2013).

Likewise, across several LMICs, young people in RCIs have been found to fare as well as, or better than, those in community-based settings (Embleton, Ayuku, Kamanda et al., 2014; Huynh, Limber, Gray et al., 2019; Merz et al., 2013; Whetten et al., 2014). These findings across LMICs contradict claims of studies from HICs that, universally, institutional care adversely affects children's wellbeing, and in fact, this contradiction was evidenced in a longitudinal study among RCIs in five LMICs (Whetten et al., 2014). Whetten et al. (2014) argued that the greatest variability in children's wellbeing resides within the care settings, regardless of whether it is institutional care or family care.

Indeed, evidence suggests that the psychosocial well-being of children in RCIs is no different from those based in their families, rather it is the availability of certain components of quality of care within the settings that make a difference (Huynh et al., 2019). For instance, higher levels of the four components of quality of care (food security, quality of shelter, quality of caregiving, and access to health care services) seemed to significantly predict more positive psychosocial well-being. The principal functions of residential care in LMICs may be more focused on meeting children's most basic and essential needs. Meeting these basic, survival needs help children move toward more complex needs and develop positive child outcomes such as better psychosocial well-being. These findings should not be taken to mean that residential care settings are the better care setting for vulnerable children, but rather that community-based care settings may perhaps not be all that different when it comes to

predicting child psychosocial well-being. Primordially, the mental health of children in LMICs remains relatively neglected and interventions to address child and adolescent mental health in LMICs also remain scarce (Lu, Li & Patel, 2018). New research evidence indicates that “one size fits all” approach will not work to address these issues (Omari, Chrysanthopoulou, Embleton et al., 2021). It is crucial that the States in LMICs make provisions for policies and practices that effectively support the improvement of quality of care with effective mental health interventions across all institutional care settings.

Many LMICs, as at yet, do not have national child mental health strategies (Shatkin, Balloge, & Belfer, 2008; WHO, 2020), therefore children in RCIs are unlikely to be conceptualized as requiring different or additional interventions and service resources after basic care and child welfare needs have been met (Vostani, 2010). Few RCIs have implementing culturally adapted interventions in their settings. For instance, by implementing evidence-based intervention programmes in RCIs while aiming to improve emotional and behavioural health outcomes, children’s emotional wellbeing, behavioural and overall mental health and development, were significantly improved (Bakermans-Kranenburg, van Ijzendoorn, & Juffer, 2008; Hermenau, Hecker, Ruf et al., 2011; Hermenau, Kaltenbach, Mkinga et al., 2015). Worldwide, there continues to be ongoing cross-cultural shared efforts in designing and adapting interventions that are effective in building children’s resilience and providing them with multiple opportunities to progress to the full limit of their developmental and mental potential (Whittaker, Holmes, del Valle et al., 2016).

6.2.1. Who are those children living in RCIs?

Placing a child in an RCI is treated as a ‘last resort’ decision after unsuccessful protection actions have been taken to combat risk of harm to the child. Across LMICs, a range of factors and circumstances influence young people’s entry into RCIs. Firstly, when a

child is orphaned following the death of their parents and when the extended family is unwilling or unavailable to act as immediate caregivers, the child is placed under institutional care. Secondly, young people commonly enter institutional care when parents are found to be unable or unwilling to provide primary care to children in terms of safety, food and shelter which represents a risk of harm to the child. Lastly, young people are often placed in RCIs when they have been subject to child abuse, maltreatment, neglect, or abandonment and they are assessed to be at further risk of harm. Hence, young people in RCIs have experiences of adversity, including removal from family, neglect, domestic violence or physical, emotional and sexual abuse. Evidence from representative samples indicate that 67% of young people have experienced at least four types of adverse childhood experiences (Briggs, Greeson, Layne et al., 2012; Chambers, Saunders, New et al., 2010; Salazar, Keller, Gowen et al., 2013). These adverse life experiences have the potential to be highly distressing for young people in RCIs and can cause substantial emotional disturbances with a lasting impact across a range of functioning (Ford, Vostanis, Meltzer et al., 2007; Morris, Salkovskis, Adams et al., 2015; Newbury, Arseneault, Moffitt et al., 2018).

6.2.2. Interventions for young people in RCIs

Building resilience and improving the emotional wellbeing of children who have experienced complex adversities will give children the capacity to resist or bounce back and improve their life outcomes. Ameliorating the self-esteem, the capacity to reflect and plan for the future, the capacity to be both autonomous and to seek help can support children to develop the ability to cope with challenges across different environments. To compensate for many children's exposure to abuse and neglect, and to reduce the psychological impact of these experiences, the care system must maximise the protective factors in children's lives. Concluding evidence from reviews indicate that the emotional wellbeing of children in RCIs

can be ameliorated through the use of research-informed and supported approaches to treatment, and through a combination of evidence-based therapeutic modalities (Hambrick, Oppenheim-Weller, N'zi et al., 2016; Leve, Harold, Chamberlain et al., 2012; Strijbosch, Huijs, Stams et al., 2015). Moreover, mental health outcomes are also significantly improved via the use of adaptations of 'mainstream' interventions typically used in community and school settings (Hambrick et al., 2016; Taussig & Raviv, 2014).

The variability in emotional and behavioural difficulties presented by young people in residential care settings is often challenging to care providers who frequently struggle to provide appropriate and evidence-supported services to address the needs of this vulnerable population (Kessler et al., 2005). Indeed, there is limited utilization of evidence-based practices in care settings (Landsverk, Burns, Stambaugh et al., 2006). Few studies have evidenced the use of evidence-based mainstream treatments among young people in care. For example, when evidenced-based engagement strategies were combined with CBT techniques in intervention programmes for children in care, children's internalising (anxiety and depressive symptoms) and externalising difficulties were significantly improved (Dorsey et al., 2014). Interestingly, they were also more likely to complete the programme's sessions and were less likely to drop out of treatment prematurely. Hence, the finding that using strategies that address barriers in treatment can lead to higher rates of successful treatment completion seems to be critically important.

Further evidence suggests that the therapy type is not more paramount than the experience of being 'heard and understood' in the setting that emotional problems occur as this lays the foundation of therapeutic responsiveness (Davies & Wright, 2008). A good way to address the mental health needs of children in RCIs is to listen to the voice of these children in the culturally-sensitive setting, in relation to their experiences of the interventions and what works best for them. A systematic review by Worrall-Davies and Marino-Francis

(2008) indicated that young people in RCIs should have a meaningful role in research and it is important to develop culturally appropriate adaptation of interventions as this is an effective way in improving mental health in specific cultures and in leading to changes in services that young people receive (Cook-Cottone & Beck, 2007; Eide & Winger, 2005).

6.2.3. Why the need for a cultural adaptation of CBT-based programme?

CBT, like most modern psychotherapies, is underpinned by Western cultural values (Naeem et al., 2019; Stone et al., 2018). There are numerous challenges when adapting CBT treatments to non-Western cultural groups (Jalal, Kruger & Hinton, 2018). For instance, CBT involves exploring, challenging and modifying core beliefs and thought patterns. However, these core beliefs, their content and underlying assumptions do vary across cultures (Tam et al., 2007). The values underpinning CBT might conflict with the cultural values and beliefs of individuals from non-Western cultures. For example, health-related illnesses are often rooted in local cultural and/or religious beliefs and values which may influence beliefs and perceptions about wellbeing, cause of illnesses and their cure, help-seeking behaviours and healing systems (Hagmayer & Engelmann, 2014; Naeem et al., 2016). There is growing evidence base to suggest that culturally adapted interventions are effective (Rathod, Gega, Degnan et al., 2018). Results from systematic reviews and meta-analyses indicates that there is a need for adapting evidence-based interventions to the local cultural context to improve treatment efficacy. For instance, adapted treatments have been found to be more effective than unadapted treatments, leading to 4 times stronger effects (Benish, Quintana & Wampold, 2011; Crumlish & O'Rourke, 2010; Griner & Smith, 2006).

Culturally adapting a CBT-based programme may be the best way that access to an evidence-based therapy be improved for non-Western communities where more than 80% of the world population lives (Naeem, 2019). Understanding the cultural context and its

influences when applying CBT-based intervention in a new cultural setting is likely to lead to better outcomes (Gaytandjieva and Bontcheva, 2013). Working towards a cultural adaptation of a CBT-based programme is arguably aiming to make adjustments in how the therapy is delivered, that is, the programme is implemented through the lens of acquisition of awareness, knowledge, and skills related to a given culture, without compromising on the theoretical underpinnings of CBT (Naeem, 2012). Studies across different cultures have found that despite little disagreement with the principles of CBT-based programmes, the therapy mostly seemed to conflict with either personal, social, familial or religious values and beliefs of individuals across countries such as India (Sinha & Chatterji, 2021), Pakistan (Naeem, 2014), Turkey (Acarturk, Cetinkaya, Gulen et al., 2019), China (Li, 2017) and the Middle East (Algahtani, Almulhim, Alnajjar et al., 2019). Normalising symptoms in culturally sensitive ways and working towards a cultural grounding of CBT intervention improves effectiveness by increasing acceptability and positive expectancy (Acarturk et al., 2019).

As previously discussed, Mauritius is a multi-cultural country where the concept of cultural creolisation is prevalent, that is, there is the intermingling and mixing of several discrete traditions or cultures that leads to mixed set of Mauritian values and beliefs. Undeniably, the mixed values and beliefs may contribute to the myths and misconceptions of mental illness in Mauritius. Despite the efforts of the Mauritian government to increase number of mental health professionals across psychiatric hospitals in recent years, many people still choose not to seek treatment (WHO, 2020). There are a number of possible factors that could contribute to this disparity. For instance, mental illness stigma continues to be a major barrier for individuals with mental illness. Mauritians tend to blame mental illness as the person's fault, these individuals are looked down upon with labels of "being mad or crazy" and that they should be locked away in asylums. Moreover, across religious beliefs,

mental illnesses are often viewed to be caused by magic spells, black magic or evil eye. For example, an adolescent with depressed mood with constant crying, social alienation or talking about death will be concluded to be possessed by evil spirits. In fact, many cultures have been found to have cultural syndromes that are related to supernatural concerns (Acarturk et al., 2019; Jalal, Simons-Rudolph, Jalal et al., 2014; Jalal & Hinton, 2015).

It is also assumed that people with depressive or anxiety problems are not religious enough, that is, they do not pray enough. It is often more acceptable to firmly believe these reasons than cope with the reality of the person being mentally unwell. Hence, perceptions of family honour, shame, fear of admission to psychiatric services, and cultural unacceptance lead many families to hide family members with mental illness within their homes. The fear of stigmatisation prevents people from seeking mental health care and support. Instead, people seek immediate solutions from spiritual/religious healers to remove the perceived magic spell or evil spirit.

There is a great lack of awareness of mental illnesses and what constitute mental illnesses in the Mauritian culture. Many people live with some mental health problems without being aware of them or how to describe them. For instance, there is no Mauritian Creole word for 'anxiety'. This word can be translated into French language however, but there are no translations to Creole language. Many people may have never heard of these words nor have an understanding of the meaning of anxiety. This may worsen the conditions of individuals given that the anxiety problems are not only unseen but also unheard in Mauritius. Hence, a cultural adaptation of the SSL programme will help educate the vulnerable children and adolescents in RCIs and the staff about emotional problems especially anxiety, the symptoms and skills to deal with them.

6.2.4. Context for the Present Study

In Mauritius, institutional care of young people lies under the aegis of the Ministry of Gender Equality and Family Welfare. Mauritius currently has 20 RCIs catered for children aged 0 to 17 years. The majority of children and adolescents admitted to the RCIs in Mauritius are found to be at risk of harm and have been subject to abandonment, neglect, maltreatment or abuse. Children and adolescents may reside in RCIs for varying periods of time, ranging from days or weeks to months and years up to the age of 18. Their discharge from RCIs depends on whether the childcare system is able to trace available family members and social networks and establish their reliability and ability to take care of the child. Over the past 5 years, there has been an alarming increase of 20% of young people being admitted to institutional care and approximately two to three new residential institutions opening on a yearly basis. Despite the increasing number of children and adolescents under institutional care, RCIs in Mauritius are currently devoid of interventions or preventative programmes for youth mental health and wellbeing. Mauritius is therefore in urgent need of addressing mental health needs of young people in RCIs.

In view of the evidence of both short-term and long-term transdiagnostic effects of the SSL as previously displayed in Table 14, it can be suggested that the integrated skills and strategies used in the intervention may be beneficial to children in several ways and hence the SSL is a promising intervention for young people with emotional problems. So far, the SSL intervention has been successfully implemented in school and community settings (Essau et al., 2014; Fernandez-Martinez et al., 2019; Orgiles et al., 2020). However, no study has been conducted in residential care settings with children and adolescents vulnerable to emotional problems.

The impact of evidence-based transdiagnostic interventions in residential care is required. There is a need for the use of both quantitative and qualitative methods to obtain

data from these children in RCIs receiving interventions, and to identify what aspects of an intervention they value and can be culturally adapted. Qualitative data may offer a richer explanation of the broad findings that emerge from quantitative data, by offering an insight into participants' views of the intervention and what works for them. Such insightful information would help the residential care system better support young people who would benefit from mental health interventions, as this is not understood or acknowledged from the perspectives of the vulnerable young people living in RCIs in LMICs.

6.2.5. Research Aims

The objective of this study is to determine the cultural adaptation, acceptability and feasibility of the transdiagnostic SSL intervention programme for emotional problems among children living in RCIs in Mauritius. The current research utilised both quantitative and qualitative methods to explore the views of young people and staff in RCIs after trialling of the evidence-based SSL intervention. In this study, the mixed-method data were used to address the question of cultural adaptation, acceptability, feasibility and level of impact of the SSL intervention for this population. Specifically, this study aimed to address the study design, such as the adequacy of the methods of recruitment and data collection for the treatment outcome. That is, how willing children are to participate, time needed to collect data, reasons for non-participation or dropping out of the programme, optimal outcome measures, and children's cultural acceptability of the programme. Another aim of the study was to get a preliminary estimate of the impact of the SSL intervention directly post-intervention and at 6-weeks follow-up. The ultimate objective of the study was to help optimize the possibility of a subsequent randomised controlled trial study as recommended by literature on feasibility studies on the adaptation of CBT programmes to new settings (Eldridge, Bond, Campbell et al., 2013; Eldridge, Chan, Campbell et al., 2016). Overall, this

study hopes to significantly contribute towards the knowledge and availability of appropriate and accessible interventions for young people in RCIs experiencing emotional difficulties, and thereby potentially improve their emotional wellbeing.

The study addressed the following research questions:

1. Is an empirical evaluation of the use of the SSL intervention in RCIs in Mauritius feasible in terms of recruitment, attendance, attrition, response rates to data collection as well as the way treatment outcomes are measured?
2. Is the use of the SSL intervention in RCIs in Mauritius culturally adaptable, acceptable and feasible in terms of treatment adherence and engagement to workbook content and techniques?
3. Is the use of the SSL intervention experienced as useful by the Mauritian children in RCIs and are there any perceived barriers to implementation?
4. Does there appear to be an impact of the SSL intervention on emotional problems (anxiety/depression) at post-intervention and at follow-up?

6.3. Method

6.3.1. Research Design

Feasibility and acceptability of the SSL intervention programme among children living in residential care settings was evaluated utilising a mixed-methods design, encompassing both qualitative and quantitative data collection. The guidelines for good reporting of a mixed method study and for complex interventions (Creswell & Clark, 2017; Craig et al., 2008) was used. This design is appropriate to evaluate an intervention before it is introduced in a clinical setting (Bowen, Kreuter, Spring et al., 2009). Quantitative data

comprised of self-reported measures assessing emotional problems collected at three different time points: pre-intervention (T1), post-intervention (T2) and at follow-up 6 weeks following the intervention (T3). The aim of measuring treatment outcomes at the different time points was to examine the feasibility of the manner in which the treatment outcomes are measured. Qualitative data involved semi-structured interviews with a selection of young people living in RCIs to explore their experience of the intervention programme, and focus group discussions with the staff of RCIs to obtain their views about the feasibility and effectiveness surrounding the delivery of the intervention programme.

This study focused on an early stage of feasibility research with a primary interest in the cultural adaptation and feasibility of the intervention and context surrounding implementation, for example, support from the RCI authorities and views of the staff towards an evidence-based and manualised intervention. Moreover, it was also aimed to examine whether there was a preliminary effect of the intervention on children and an exploration of what factors may contribute to, or impede, the successful delivery of the intervention programme. Lastly, the results of the feasibility study helped determine whether a future randomised controlled trial with waitlist control was required to assess the effect of the intervention.

6.3.2. Procedure

6.3.2.1. Ethical Approval

Ethical approval to conduct this study was received by the University of Roehampton Ethics Committee (see Appendix 1). Approval for this study was also sought and granted by the Ministry of Gender Equality and Family Welfare in Mauritius (see Appendices 14 & 15). In Mauritius, RCIs fall under the aegis of Ministry of Gender Equality and family Welfare, with a few of the RCIs being run by the government while most of the RCIs are run by NGOs who work in close collaboration with the government. Informed consent for participation was

received from two RCIs which were situated in two different sub-regions of Mauritius. These two RCIs catered for mixed gender children and adolescents up to the age of 18.

Following informed consent from the respective RCIs, verbal consent was also sought from the children of each RCIs before commencing the study. Children were introduced to the study and informed about their participation in the programme. Consent information was provided to the children by outlining the aims and importance of the research, the potential risks of harm, its voluntary nature and it was highlighted that confidentiality and anonymity would be assured and the right to withdraw from the research study would be respected.

6.3.2.2. Recruitment

Each RCI was approached with details of the study. The procedure for screening of participants must also be tested for feasibility, since most of the time, the identification of children and adolescents at risk of emotional problems requires a screening procedure. However, this screening procedure must be seen as acceptable to the new setting being examined. In Mauritius, being at an early stage of research on mental health, screening procedures of entire groups of young people in RCIs is neither seen as usual nor acceptable. Screening the entire group of young people in the RCIs was therefore not an option. As an alternative screening method (Fazel, Hoagwood, Stephan et al., 2014), RCI staff were approached and asked to identify children and/or adolescents they considered to be displaying emotional problems. RCI staff selected the children/adolescents based on their own experience of working with them, and in fact, most of the young people living in the RCIs were referred for the SSL programme. Thus, these selected children were considered most likely to benefit from the SSL intervention programme.

The SSL programme was delivered by the researcher, a clinical child psychologist with at least 5 years of experience in working with children/adolescents with mental health problems in Mauritius. The researcher was checked and cleared by the disclosure and barring service (DBS) in the UK, and the DBS's equivalent service in Mauritius (morality certificate), before the commencement of the programme. The data was collected by a research assistant (a Psychology graduate with appropriate morality certificate in Mauritius) who was blind of the condition allocation of the children. Before implementing the programme in Mauritius, the researcher received intensive training by the principal author of the SSL programme and also worked as a facilitator in implementing the SSL programme in the UK. The aim of doing this was to ensure fidelity of protocol commitment and to overcome potential challenging situations during the implementation phase of the programme and data collection. The training received covered topics related to anxiety and depression and their risk factors, principles of prevention, organization, ethical issues and group-process skills. Moreover, the content and organisation of each session of the SSL were reviewed, along with the activities to be conducted. Additionally, the researcher received a leader's manual, which provides a detailed outline of each session of the SSL programme. Weekly online supervisions were provided by the lead author of the SSL to address any implementation concerns in Mauritius.

All selected children gave verbal consent and expressed their wish to be part of the programme. The participants were provided with instructions and assistance with the completion of the session tasks or questionnaires. Prior to the intervention, children completed questionnaires which were also completed immediately post-intervention and at follow-up 6 weeks later. The children were informed that their responses would remain confidential and that there were no right or wrong answers. Young people and staff in each RCI were offered the opportunity to participate in individual interviews (children) and focus

group discussions (RCI staff) following the intervention at T3. The researcher carried out the interviews and focus group discussion, which were audio-recorded to support the transcription of data. A time schedule was organised with the help of the RCI staff to ensure that the programme be conducted at a fixed time convenient to the RCI and the children. There were three groups of children in each RCI, with 6 participants in each SSL group. Data collection and the SSL sessions were conducted after school hours and on Saturdays. During the delivery of the SSL, the facilitator was assisted by one staff member of the RCI. The whole study took place during a period of five months, from October 2019 to February 2020.

6.3.3. Participants

36 participants, 53% female and 47% male, with an average age of 11.06 years ($SD = 1.87$, range 9 to 14) participated in this study. All participants were Mauritian nationals with the most self-reported ethnic groups being Creole (68%), Hindu (27%) and Muslim (5%). All the children were attending regular schools and had lived in the RCIs from 1 to 8 years ($M = 4.06$; $SD = 1.53$). All the children were placed in the RCIs following child maltreatment and 39% of them were living in the RCIs together with their siblings.

The selection criteria of participants were: (a) to be aged between 9 to 14 years; (b) to present/report difficulties in managing emotions or emotional symptoms as identified by RCI staff; (c) to report a willingness to attend assessments and SSL sessions; (d) not to be undergoing active psychiatric treatment and/or concurrent psychological treatment and (e) not be in the process of leaving the RCI. Following the SSL intervention at T3, participants were invited to participate in semi-structured interviews. Eight participants (two from each SSL group; five females; $M = 11.88$ years; $SD = 1.73$) volunteered to be interviewed at the end of the intervention. A focus group discussion was also carried out with five staff from both RCIs (all females; $M = 35$ years; $SD = 4.12$).

6.3.4. The cultural adaptation of Super Skills for Life (SSL)

The last Chapter examined research on SSL that indicated the efficacy of the intervention as an indicated prevention and treatment of emotional problems among children and adolescents. The following section will focus on the cultural adaption of the SSL in the Mauritian context.

6.3.4.1. Linguistic adaptation and translation of SSL

The SSL intervention programme was originally developed by Essau and Ollendick (2013) in the English version. Prior to conducting the feasibility study, two bilingual translators, who were also psychologists in Mauritius, translated the original SSL programme (both the workbook and the manual) into French language. The back-translation method was used to validate the quality of the translated materials. Discrepancies were identified and addressed by the translators for reconciliation and changes, if required, to be made. The linguistic translation took into account the cultural adaptation of the SSL to the Mauritian culture (see Table 15).

Table 15.

Linguistic adaptations of the SSL

Adaptation Principle: Language	Examples of cultural adaptation in SSL	Rationale
Translation into French language	Linguistic and semantic appropriateness was taken into	It was ensured that the same descriptions of all key terms

	<p>consideration during the translation to ensure that the semantic meaning of words was culturally relevant, with the text content being simplified phrasing and wording. Some key words were challenging in the translation such as ‘skills’, ‘anxiety’, ‘distress’ and ‘self-esteem’. These words were easily translated into French language however, these words were often unheard of in the Mauritian culture with no existing Creole translation of these words. Children were taught about these words with the aid of definition characteristics, symptoms or the most-closed synonyms were used without compromising the semantic meaning.</p>	<p>were used throughout the programme so as to maintain consistency in language and hence enhance comprehension of children.</p>
<p>Use of local idioms</p>	<p>Use of local idioms, for example: “thinking a lot” (psychological distress) “feeling stressed and panic with body shaking” (anxiety/panic) “I don’t feel well emotionally” (emotional problems)</p>	<p>These concepts are associated with general psychological distress and common emotional problems in Mauritius. Making use of these local idioms made sure that</p>

	<p>“I am afraid my heart stops” (panic attack)</p> <p>“I wish I could sleep and not wake up” (depression)</p>	<p>materials/content related to mental health and/or illness are easily understood and help in the promotion of mental health wellbeing among children.</p>
<p>Technical terms replaced by colloquialisms</p>	<p>Anxiety is more closely associated with ‘traka’, (stress; tension), ‘per’ (fear), ‘latete fatiguer’ (disturbed brain), while depression is commonly known as ‘dépression’ itself, with the same literal and semantic translation in French and Creole languages.</p> <p>Anxiety referred to as ‘traka’ (stress); distress referred to as ‘senti pa bien’ (not feeling well); skills referred to as ‘competence’; ‘dan seki zot bon’ (things that you are good at); self-esteem referred to as ‘sentimen ki zot vau kitsoz’ (feeling that you are worthy of something’.</p>	<p>These terms were identified as most relatable and appropriate in the Mauritian context, given the limited use of mental health words in the Mauritian context.</p>

6.3.4.2. *Adaptation of the SSL content*

The SSL consisted of eight elaborate sessions. Table 16 presents the description of the session topics, the original SSL concepts and activities of each session and the cultural adaptation of SSL concepts, while taking into account local idioms and cultural syndromes.

In the first and last sessions (sessions 1 and 8), children were given 2-minute video-recorded speech tasks. Firstly, in the initial session, children were provided with an opportunity to introduce themselves and understand the purpose of being part of the programme. Given that the children were well-acquainted with each other, they were then immediately requested to present themselves during a 2-minute video recording in front the group. They were encouraged to talk about anything they would like to share with their group and these videos were then viewed as a group in the next session while focusing on positive aspects and features of the child's presentation. For the remaining sessions that followed, children were introduced to topics as described in Table 16 with the aim of helping children develop the appropriate skills and strategies they have been taught. In the last session (session 8), for the video-recorded speech task, children were encouraged to say something about what they had learned from participating in SSL and about the skills they found most helpful. In both speech tasks, before the children were shown their video, they were instructed to pay attention to the way in which they appeared during the speech and not on how they felt.

Table 16.

Super Skills for Life: Session Topics, original SSL concepts and activities and cultural adaptation of SSL concepts

Session Topics	SSL Concepts & Activities	Cultural adaptation of SSL concepts
Session 1: Introduction	<ul style="list-style-type: none"> • Introducing Super Skills for Life • Getting to know each other • Introducing session rules and reward system • 2-minute video presentation • Introduction to concept of self-esteem • Teaching children ways to improve their self-esteem through scenarios and activities 	<ul style="list-style-type: none"> • At the beginning, it was important discuss the aim of the programme given that this was one of the occasions where children were exposed to an emotional resilience building programme. • ‘Passing the ball’ game was used to get to know each other and their hobbies. • Mauritians are not emotionally-expressive and children did not find it common to talk about their emotions. • Examples of pictures of different facial expressions of emotional states were shown to children and socio-emotional experiences were shared by the facilitator.

		<ul style="list-style-type: none">• Children were encouraged to use the session as a platform to discuss about their emotions, emotional experiences (e.g. happy/sad/panic) and the symptoms of emotional problems and how common they can be.• Children were asked to write down their strengths and keep it a secret. The papers were collected and each quality was read out one at a time by the facilitator and children had to guess who it was.• Children were shy but receptive to the video-speech task.• Video-speech tasks were deemed acceptable by most children and this related to the fact that the children had limited access to technology.• Building a positive self-image by imagining an inner-guiding famous local personality.• Appreciation of their efforts by clapping and congratulating the children helps in building their self-esteem and positive self-image.
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<p>Session 2: Feelings</p>	<ul style="list-style-type: none"> • Introduction to concept of feelings • Recognising different feelings through signs (facial expressions, body postures) • Feelings detective game – role-playing various feelings • Feelings thermometer to describe intensity of feelings being experienced • 2-minute presentation video-feedback 	<ul style="list-style-type: none"> • In Mauritius, it tends to be shameful to talk about mental illnesses. “Mental illnesses” (<i>malade mentale</i>) are viewed with negative attitudes and are spoken about in derogatory and prejudiced manner. They are viewed to be occurring to other individuals and their families but not to oneself or one’s family. • Scenarios of experiences of emotional problems by close friends (fictitious names) were enacted and children were encouraged to express the feelings felt by the characters through verbal and nonverbal signs. • Local proverbs such as “everybody has their own troubles” (<i>saken senti so douler</i>), “do not hurt others” (<i>pa fer lekel fermal</i>) were used to normalise emotional problems and address stigma. • Children were enthusiastic to watch their own videos and were receptive to video-feedback.
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<p>Session 3: Thoughts</p>	<ul style="list-style-type: none"> • Introduction to concept of thoughts • Recognising helpful and unhelpful thoughts • Discussing consequences of having helpful and unhelpful thoughts • Detecting and challenging unhelpful thoughts • Building goals and setting targets • Role-playing positive feelings and thoughts 	<ul style="list-style-type: none"> • Symptoms of emotional problems may be attributed to local cultural syndromes and this attribution may produce catastrophic cognitions. • Children were asked about unhelpful thoughts (catastrophic cognitions) related to experience of symptoms. For example, children reported feelings and thoughts (cultural syndromes) of “going crazy” “thinking a lot” “dying during sleep” and “attacked by evil spirits/evil eye”, which may escalate their anxiety and depression symptoms. • Addressing these unhelpful thoughts that reinforce stigmatisation helps modify the key catastrophic cognitions and increases treatment adherence. • During the last 5 minutes of the sessions, children were encouraged to engage in folklore play activities.
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		<ul style="list-style-type: none"> • Children participated in the “telephone game”, whereby a message is given to the first person in line and then they are instructed to pass the message on by whispering it in the ear of the next person in line. • This game illustrates how quickly a message can be altered even when passed from person to person in a relatively short line.
<p>Session 4: Linking Thoughts, Feeling and Behaviour</p>	<ul style="list-style-type: none"> • Explaining the link between thoughts, feelings and behaviours • Understanding how thoughts, feelings and behaviours are linked in different situations and how they can be challenged – role-playing scenarios • Recognising and differentiating body signals – nervousness/anxiety 	<ul style="list-style-type: none"> • The ABC model was used to demonstrate the relationship between thoughts, feelings and behaviour. • In small groups, children were asked to enact local context scenarios linking thoughts, feelings and behaviour and other groups had to depict the nonverbal cues. • Using examples of culturally salient TV programmes or recent local social situations, children were taught

		<p>emotion regulation and the ability to re-focus their attention on positive aspects in life instead of their fears.</p> <ul style="list-style-type: none"> • Applying local play activity – “1-2-3-Sun”, whereby a pair of children would enact different facial expressions and try to make the rest of the group laugh. The rest of the children should try and avoid laughing or moving.
<p>Session 5: Learning to Relax</p>	<ul style="list-style-type: none"> • Explaining the importance of relaxation – being in relaxed state • Practicing various relaxation strategies – deep breathing, visualisations, humour, progressive muscle relaxation 	<ul style="list-style-type: none"> • Relaxation techniques were deemed as acceptable to children and short relaxation techniques were carried out at the beginning of each session. • Specifically, session 5 was carried out in the garden of the RCIs, where children were taught relaxation skills and how to apply them in their daily lives. • Local therapeutic practices such as yoga and meditation were also encouraged to children.

		<ul style="list-style-type: none"> • Most children reported praying and seeking peer support as major aids that helped improve their resilience when facing struggles.
<p>Session 6: Social Skills</p>	<ul style="list-style-type: none"> • Explaining various types of social skills • Understanding friendly and unfriendly behaviours • Role play on various social interactions such as on how to introduce oneself, joining and maintaining a conversation, how to end conversations politely, and using nonverbal skills such as eye contact and safe distance 	<ul style="list-style-type: none"> • Social Skills Training was well-accepted by children who were receptive and enthusiastic to carry out the role-plays. • The first part of the session included role-plays depicting social scenarios within the Mauritian context such as meeting with people at markets, hospitals, schools, funerals and parties. • The second part of the session included giving the children the opportunity to visit other houses in the RCIs and interacting with the caregivers and staff, while applying the social skills learnt.

<p>Session 7: Problem-Solving Steps</p>	<ul style="list-style-type: none"> • Introduction to learning to cope with conflicts with peers and other social problems • Teaching problem-solving steps in problem resolution • Role-play of common conflict situations and applying the problem-solving steps 	<ul style="list-style-type: none"> • Problem-Solving Training was given to children who were introduced to adaptive and maladaptive problem-solving orientation using specific scenarios such as friends asking to elope from RCI. • Children were taught to use core problem-solving skills such as problem formulation, brainstorming solutions, decision-making about the best solution and solution implementation and evaluation. • The session ended with a local folklore play activity, “la marelle” (hopscotch).
<p>Session 8: Review</p>	<ul style="list-style-type: none"> • Overview of all the previous sessions • Review of all learnt skills during the programme • Video feedback 	<ul style="list-style-type: none"> • A review of the sessions was done. • The video-speech task was carried out, where children were asked to talk about their strengths and learnt SSL skills for 2 minutes.

		<ul style="list-style-type: none">• Play activities were organised for the children in the RCI gardens such as treasure hunt and musical chair with music and dance.• Certificate of participation and light snacks were given to the children to thank them for their participation.
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6.3.4.3. *Adaptation of the SSL Implementation Protocol*

The eight sessions of the SSL programme were implemented once a week for the duration of eight weeks. Each session lasted approximately 45 minutes, however, an additional 15 minutes were taken if required. A total number of six groups of children participated in the SSL, with 6 children in each group. Each group was assigned a specific day and time of the week for the SSL programme. Participants were asked to complete the T1, T2 and T3 questionnaires at the relevant time points, directly before the first session (T1), directly after the eighth session (T2), and following the six-week waiting period after the eighth session (T3).

The researcher made use of the SSL's manual to adhere to the step-by-step instructions that were clearly outlined. The instructions outlined the main aims and strategies to be used for each session; the desired outcomes, and the exercises to be used in order to meet these outcomes. Hence, the manual was used as a guide to ensure consistency across each session. Adherence to the SSL manual was monitored by completion of attendance log and session-specific checklist of all required materials and activities (see Appendix 16). The researcher also recorded in writing the degree of application of each session, for example, participants' level of engagement, whether home activities were completed, and any other relevant feedback on each session; these records allowed an assessment of the implementation fidelity of the programme.

Children were given a workbook with detailed content of each session containing its main concepts, exercises, activities and homework. The workbook assisted the in-session lessons and enabled the children to refer to them to implement the skills in real-life situations. Practical and enjoyable scenarios, role-plays and activities adapted to the Mauritian culture (see Table 16) were used to ensure that the cognitive, emotional, behavioural and

physiological experiences of the children are accentuated. During the sessions, the researcher continuously reinforced the participants' positive behaviour (e.g., attendance, being on time, participation, trying/completing homework, helping their friends with homework) through social reinforcement, stickers of different colours and shapes or putting colourful stickers on the activity sheets. In order to practice the contents covered in the first seven sessions, children were encouraged to complete their Super-Task (homework) (e.g. talking to a new person using the skills learned, doing an enjoyable activity, etc). After each session, RCI guardians of the children were met with and verbally informed about the homework, the skills learned and guidelines on how to reinforce them with the children. Before the start of a session, a review of the previous session and its tasks were discussed. Children who missed a session needed to complete an individual session with the researcher before they could join the next group session. At the end of the programme, all participants were given a certificate for completion of the programme and an acknowledgement of their participation.

6.3.5. Measures

6.3.5.1. *Quantitative Measures*

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Appendix 9), was used to measure emotional and behavioural symptoms and positive attributes of children (see Table 17). Higher scores on the scale indicating greater difficulties or problem behaviours. Subscales were combined to measure overall internalising behaviours and overall externalising behaviours. The official translation for the French version of the SDQ was used in the present study (<http://www.sdqinfo.com/>).

The Revised Children's Anxiety and Depression Scale (RCADS; Chorpita et al., 2000; see Appendix 17) was used to measure DSM-IV relevant symptoms of major

depressive disorder and anxiety disorders (see Table 17). Higher scores on the scale indicated more severe symptoms. The official translation for the French version of the RCADS was used in the present study (<https://www.childfirst.ucla.edu/resources>).

The child version of the Cognitive Emotion Regulation Questionnaire (CERQ-k; Garnefski et al., 2007; see Appendix 18) was used to measure cognitive emotion regulation (ER) strategies that children use in response to their experience of threatening or stressful life events (see Table 17). The CERQ-k consists of 36 items representing nine subscales. Four of the subscales represented maladaptive ER strategies and five subscales represented adaptive ER strategies. Higher scores on the scale indicated more pronounced use of the ER strategy. The English version of the CERQ-k was adapted and translated according to guidelines for the successful translation of instruments in cross-cultural research (Brislin, 1970). One bilingual translator who was also a native speaker blindly translated the questionnaires from the original language (English) to French, and another bilingual individual translated them back to the original language. Differences in the original and the back-translated versions were discussed and resolved by joint agreement of both translators.

The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965; see Appendix 19) was used to measure children's global self-esteem (see Table 17). This-10 item self-reported measure was rated on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree), with higher scores reflecting higher levels of self-esteem. The official translation for the French version of the RSE was used in the present study (Vallieres & Vallerand, 1990).

Behavioural assessment of Anxiety (Video speech Tasks)

The video speech tasks carried out during the first and last sessions were assessed for behavioural signs of anxiety using the Social Performance Rating Scale (SPRS) developed by Fydrich, Chambless, Perry et al. (1998), modified for use with children by Essau et al. (2019)

(see Appendix 20). This rating system has been used in several studies that have shown significant reductions in behavioural indicators of anxiety among children and adolescents who have participated in the SSL programme (Essau et al., 2014b, 2019; de la Torre-Luque, Fiol-Veny, Essau et al., 2020). Using the social performance scales, two raters independently rated the video speech tasks of each participant at both pre-test and post-test sessions. All of the videos were rated (offline) on a four-point scale from 1 (very poor) to 5 (very good) on the behavioural indicators of length of eye gaze, vocal quality, length of speech and conversation flow, however, this differed for the behavioural manifestation of discomfort where the four-point scale ranged from 1 (very high) to 5 (very low). Both raters, who held a Masters degree in Psychology, did not take part in the SSL programme implementation and were blind to the children’s scores in other measures. Inter-rater reliability analysis was used to measure the variation in scoring between the two independent raters. Intraclass correlation coefficient yielded high values for session 1 video ratings ($\alpha = .99$) and session 8 video ratings ($\alpha = .94$), confirming reliability of scores on the same behavioural indicators across all participants. Given the high level of agreement between the two raters, the final mean rating scores of the two raters were calculated for further analyses.

Table 17.

Summary of measures used in Study 3

Construct	Measure	No. of items	Response options	Cronbach’s alpha
Strength and Difficulties Questionnaire (SDQ; Goodman, 1997)	Total Difficulties	20	3 (not true to very true)	.68
	Emotional problems	5		.77
	Conduct problems	5		.50
	Hyperactivity	5		.46
	Peer problems	5		.48
	Prosocial	5		.42

	Total Impact	5	4 (not at all to a great deal)	.94
Revised Children's Anxiety and Depression Scale (RCADS; Chorpita et al., 2000)	Total Anxiety	37	4 (never to always)	.89
	Separation Anxiety	7		.74
	Generalised Anxiety	6		.69
	Social Phobia	9		.60
	Panic Disorder	9		.70
	Obsessive-Compulsive Disorder	6		.61
	Depression	10		.74
Cognitive Emotion Regulation Questionnaire-short (CERQ-k) (CERQ; Garnefski et al., 2007)	Total CERQ	36	5 (almost never to almost always)	.84
	Acceptance	4		.53
	Positive Refocusing	4		.57
	Refocus on Planning	4		.56
	Positive Reappraisal	4		.63
	Putting into Perspective	4		.62
	Self-blame	4		.72
	Rumination	4		.68
	Catastrophizing	4		.65
	Other-blame	4		.54
Rosenberg Self-Esteem Scale (RSE; Vallieres & Vallerand, 1990)	Self-esteem	10	4 (strongly disagree to strongly agree)	.55
Social Performance Rating Scale (Fydrich al., 1998)	Behavioural assessment of anxiety	5	4 (very poor to very good)	.80

Fidelity Measures

Children's attendance in each group was recorded for each session. This was to ensure that individual sessions could be provided to children prior to the next upcoming session.

Moreover, adherence to the SSL manual was monitored by completion of session-specific checklists of all required materials and activities (see Appendix 16). After each session, the researcher completed session feedback: rating the level of preparedness, children's reactions to the session's content, their opinions as to whether the content was understandable, sufficient or too much for them to assimilate, and children's perception of their homework.

User Satisfaction

Children and staff were asked how satisfied they were after each session. They were asked three questions to indicate their level of user satisfaction (*did you like the session?; did you participate in the session?; did you learn anything new in this session?*). The responses were rated on a 7-point Likert scale from 1 to 7 (1 = they did not like, participate, or learn anything in the session; 7 = they liked, participated, or learned a lot in the session) (Martinsen, Kendall, Stark et al., 2016). These questions were asked after each group session.

6.3.5.2. Qualitative Measures

In order to generate a rich and contextualised understanding of participants' insights into the SSL intervention programme, this study utilised semi-structured individual interviews with volunteer young people ($n = 8$) and a focus group discussion with staff ($n = 5$) who had participated in the SSL programme. Semi-structured interviews were employed to allow a deeper exploration of individuals' perceptions. This method was selected as it allows freedom and flexibility in approach and provides the opportunity to gather detailed responses which were not limited to a restricted set of answers. Informed consent was sought from both the young people and the staff before the interview took place.

The interview schedules for children and staff (see Appendix 21) were informed by literature on feasibility studies of intervention programmes for young people and

stakeholders' perceptions of interventions (e.g. Martinsen et al., 2016; Todd, Cooksey, Davies et al., 2018). The interviews were semi-structured and followed an explorative approach. They made use of open-ended questions and the first part of the interview focused on participants' subjective experience and potential difficulties of the workbook and its exercises (e.g. "What comes up in your mind when you think about the 'Super Skills for Life' programme?"; "What was your experience with the exercises in the workbook?"). Psychological experience of the intervention was also explored (e.g. "What changes in your emotional state have you noticed since you started the programme?"). In the last part of the interview, participants were asked for feedback regarding the programme and their ideas for future improvement (e.g. "How do you think this programme can further help children?"). In the focus group discussion, staff were questioned about their views and feedback concerning the SSL programme and ideas for improvement (e.g. "How would the SSL programme benefit your institution and the children?"; "How practical do you think this intervention is?"). Overall, the key interview questions covered: Perceptions of programme components and delivery; outcomes associated with participation; sustainability of SSL techniques used; positive and challenging aspects of the programme, and effectiveness and feasibility of the SSL intervention delivery.

6.3.6. Data Analysis

The purpose of the statistical and qualitative analyses was to evaluate the feasibility and acceptability of implementing the SSL. The acceptability of SSL was examined quantitatively by looking at overall levels of attendance, completion rates and drop-out from intervention; and qualitatively by drawing on data from the semi-structured interviews and focus group discussion. Semi-structured interviews of participants and focus group discussions were audio recorded, transcribed verbatim from Creole to English language and

analysed using thematic analysis in NVivo version 11. For the thematic analysis, full interview transcripts were repeatedly reviewed for data familiarisation; initial codes were generated, followed by collating codes into themes, refining themes, and finally defining themes and sub-themes (Braun & Clarke, 2006). The thematic analysis yielded a list of themes, which were then arranged by each of the study research questions, so that themes relevant to each question could be used to answer it. Information coded under these themes were then used to answer the question about the feasibility of this aspect of the research methods.

A check for credibility of the thematic analysis was also conducted, whereby 10% of transcripts were reviewed by the research assistant. Overall, there was high agreement on the main themes that were identified. Any disagreements were discussed, by going back to the transcripts and considering different understandings of the data, until consensus was reached. Quantitative analysis was conducted using SPSS version 25. Feasibility was assessed by attendance and retention for the intervention and the way in which the treatment outcomes are measured. In order to assess whether the intervention may have produced changes related to the SSL, we compared changes in emotional and behavioural difficulties, anxiety and depression, emotion regulation and self-esteem scores before and after the intervention using paired *t*-tests.

6.4. Results

The mixed-methods quantitative and qualitative data are presented to address the research findings. Each research question has been addressed by the qualitative findings, that were generated from the analysis of the semi-structured interviews and focus group discussion and the qualitative data was supported by quantitative findings.

6.4.1. Research Question One:

Is an empirical evaluation of the use of the SSL intervention in RCIs in Mauritius feasible in terms of recruitment, attendance, attrition, response rates to data collection as well as the way the treatment outcomes are measured?

6.4.1.1. Recruitment

The recruitment process for this study in Mauritius occurred during the period from July 2019 to September 2019, whereby informed consents were sought. Staff from two RCIs referred 45 children for this study. Out of these referred children, 80% ($n = 36$) were found eligible to participate based on the eligibility criteria. Reasons for non-eligibility are shown in Figure 1. The eligible participants were deemed an appropriate number of participants to identify important themes through thematic analysis (Guest, Bunce, & Johnson, 2006).

From the analysis of the focus group discussion carried out at the end of the SSL programme, RCI staff reported that they were generally satisfied with the method of recruitment, which involved them identifying children they considered to be displaying emotional problems. They reported that their working experience with the children in the RCIs enabled them to identify emotional difficulties in children. No issues with the consent process were raised in the interviews with the staff and children.

6.4.1.2. Attendance and Attrition

There were no dropouts from the six SSL groups at any time point after the groups started the programme or at data collection (T1, T2 and T3). The participants attended 98% of the SSL sessions and 100% of the data collection (details at Table 18 below). The high adherence to data collection indicated that the manner in which the treatment outcomes were measured were deemed feasible to children. On separate occasions, one or two children had missed a particular SSL session. The reasons for missed sessions related to children being

either poorly, being admitted to hospital or having to attend sports tournaments on the day and time of the session. The missed SSL sessions were carried out individually with the children before the next scheduled session took place. Given that the SSL group sessions were held after school hours or on Saturdays, and within their home environment of the RCI, attrition was low and attendance was a highly favourable indicator for the programme implementation fidelity. All the face-to-face semi-structured interviews and the focus group discussion were held at a time convenient to the participants and attendance was 100%. The average duration of the interviews was 36 minutes ($SD = 5.43$; range 29 – 46).

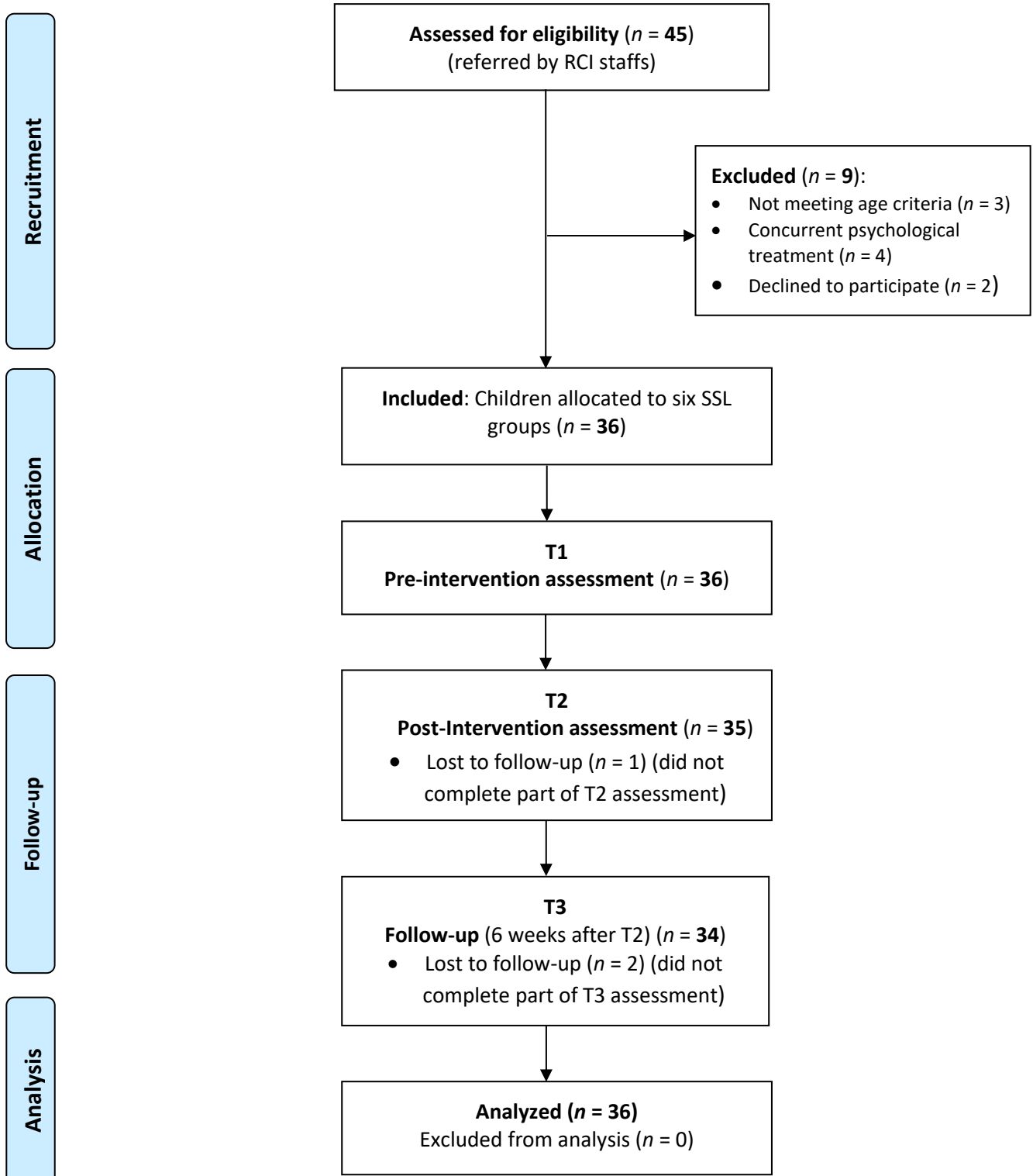


Figure 2. Flow-chart of study 3 based on CONSORT statement

Table 18.

Attendance per Session and Time-points

Sessions/ Timepoints	1	2	3	4	5	6	7	8	Pre- test	Post- test	Follow- up
Attendance (%)	100	97.2	100	100	94.4	97.2	100	100	100	100	100

6.4.1.3. Response rate to data collection

As displayed in Table 18, all participants attended the different time-point assessments (pre-test: T1, post-test: T2 and follow-up: T3). However, three participants did not complete part of the T2 and T3 assessments (see Figure 2). Their data were not excluded from analysis given that fewer than 25% of the items were missing. In cases of the missing items, data were replaced by the mean of the participants' scores. The completion rates for data collection were relatively high at all time-points (94% - 100%) and the amount of missing data did not differ at the different time-points.

6.4.1.4. Theme 1: "Everything about SSL felt different but nice"

The high attendance, response rate and fidelity during the SSL implementation were also supported by qualitative data under the theme "**Everything about SSL felt different but nice**". At the beginning, the participants were quite sceptical about the programme. This is likely to be because there are no current programmes for children in RCIs that particularly address mental wellbeing. This was the first time they had heard of a programme where they would be learning new topics such as 'skills', 'emotions' and 'anxiety' but in a non-academic manner. They were not sure what they were supposed to be doing and it took them some time

to adjust and understand that they were not being graded. The adjustment was made easier by the facilitator's positive stance on psychoeducation of the SSL concepts.

"...When we started the programme in the beginning, I did not understand why we are doing this programme. Because it is different and I never heard about it. No one explains things about the mind and feelings. This is the first time I have learnt about all this. It's nice" [Participant#3, age 10].

"This is new. It is helping me with my problems, dealing with my feelings. It is helping me with understanding myself and how to express myself better" [Participant#1, female, age 14].

6.4.1.5. Theme 2: Learning curiosity of the SSL concepts

Children seemed to have developed a **learning curiosity of the SSL concepts**, an eagerness for what will be coming next:

"...I do not think there are other programmes like this one where we learn so many new things. It will be good if we continue to learn new things about ourselves. This will help us in everyday life. I look forward to the next session each week" [Participant 7, age 13].

"...This is the first programme that we have done which talks about our emotions and feelings. When we are in shelters, we miss our parents a lot and sometimes we do not understand our emotions and feel stressed. So, we eagerly wait when we will meet again. It is helpful when we are here." [Participant 4, age 12].

A member of the RCI staff also shared that the children were eager to attend the next session and they would narrate their activities and session work to their caregivers:

“I think the SSL has been really beneficial to the children. The caregivers would share how excited the children would be for the next session and they would happily re-enact the role-plays or activities done during the session at home with their caregivers” [Staff#2].

6.4.1.6. Theme 3: Group Dynamism

Creating a ‘different’ new environment within the SSL groups, also seemed to build a positive **group dynamism** and reinforce friendships which in turn may enhance retention to the programme:

“...Doing group sessions seem better than individual sessions. Individual sessions can be boring because friends won’t be together. In groups we can share a lot of ideas, and we did remember?... We played so many new games and did sketches. They were so fun. A group had to enact a sad scenario but they could not stop laughing, that was so funny” [Participant 4, age 12].

“...It’s also a time when the children get to meet other friends and have fun together. Though they live in the same RCI, they live in different houses. They do not get enough time to meet with the others. So, I believe that the SSL being done in groups help them more” [Staff#5].

“...It’s more fun doing the sessions among friends. We have fun together and we also learn together. We do not feel tired after the sessions, it’s fun, it makes us happy. We go and tell our mother what we did in the sessions and it makes her happy as well” [Participant 3, age 10].

6.4.2. Research Question Two:

Is the SSL intervention culturally adaptable, acceptable and feasible in terms of treatment adherence and engagement to workbook content and techniques?

The SSL programme was implemented as intended. Adherence to the intervention content was examined through completion of session-specific checklists of all required materials and activities and across both RCIs, treatment engagement was on average 98%. After each session, both the researcher and the participants displayed adequate levels of preparedness for participation during session. Children displayed a positive understanding of the sessions' contents and they were able to explain the content learned in their own words. Most of the children completed their homework on a weekly basis. They generally found the homework to be easy, and if perceived to be difficult, they received help from their group friends to complete it before the next session. Overall, the SSL was found to be culturally adaptive with evidence of acceptability and feasibility. Engagement and fidelity to the intervention are discussed further in the qualitative data described below.

6.4.2.1. Theme 4: Acceptability of SSL content

The children found many of the SSL concepts and techniques (e.g., learning about feelings, emotions, thoughts, relaxation techniques, social skills, problem solving skills) easy to understand and very helpful. They reported enjoying the activities and learning new skills. For example:

“...Problem-solving skills have been quite helpful to me. Because I have a lot of problems. Normally when I face a problem, I do not like to share or talk about anything. But now I know how to solve my problems and even share with others” [Participant 1, age 14].

“...the relaxation techniques...I felt good after the sessions. They were really helpful and I still use the techniques. I also loved the role plays which we did together. It also helped us understand social situations better and not to be scared of any social situations in our

future lives. We should also love ourselves and then we won't feel scared of anything"
[Participant 5, age 13].

Role-plays were also reported to be especially enjoyable, and when one of the children learned a new concept, the rest of the group followed:

"...I think the role plays were really exciting and fun. We made role plays on different social circumstances, for example, making use of verbal and nonverbal social cues. How we can help someone feel better through good communication. Some children who are often shy also participated and it was fun" [Participant 2, age 9].

"...whatever I learnt it stays in my mind and I think about it often. I try to practice the things we learn just like we do in the role plays" [Participant 3, age 10].

The staff also found the SSL content and techniques to be feasible, acceptable and age-appropriate. They were glad to be learning the skills alongside the children. They reported that sometimes there is a lack of awareness of emotional problems among children, how to recognise the symptoms and how to help children tackle emotional difficulties. Attending the sessions allowed them to build and reinforce their repertoire of skills. They expressed their eagerness for more psychoeducation about new concepts.

"...I think that this programme will be extremely beneficial to these children. It is simple. It is interactive and it is easy for children to understand. I enjoyed following a few sessions with the children. I saw how the children were interested and participative. It is not like schoolwork. Of course, schoolwork is important also, but it is also important to teach children why they feel angry at times, why they feel sad" [Staff#5].

"...To be able to live and work with children in RCIs, you have to have love for children and you have to learn to understand them. These children are innocent. They are

victims. They are in need of emotional support and, us, living with them as caregivers, we have to give them the emotional support. Through the SSL programme, we are also learning how to give them the emotional support and how to understand them” [Staff#3].

“...For example, the children in our RCI are not bad. People judge them because they live here in RCI. But they are normal children. It’s difficult for them to be living here for so many years. They need to have such sessions where they are able to express themselves. They should understand their feelings and emotions. This will allow them to ameliorate their lives and be less influenced by negativity such as peer influence or drugs” [Staff#1].

“...Together with the children, I have also learnt about the concepts. These skills will help me also. I think that these sessions should be done often, where children and adults learn new things” [Staff#4].

6.4.2.2. Theme 5: Increased Knowledge and Understanding

Children reported that the SSL concepts they learnt had increased their knowledge and understanding about themselves and others. They were never exposed to such concepts before and were happy to learn new skills:

“...before, I didn’t really understand the meaning of ‘skills’, but now I do. It is about qualities, thoughts, feelings, communication and trust. How to trust others, how to trust ourselves [Participant 4, age 12].

“...I think now I have more skills, good skills. Good skills to talk to people, to my friends and teachers. When something bothers me, I try to think what is bothering me. I relax and think calmly. I also try to think of positive thoughts, not bad thoughts which will made me more stressed” [Participant 5, age 13].

6.4.2.3. *Theme 6: Home Practice*

Children expressed that they found the super tasks as enjoyable because they were not the typical ‘homework’ that they received from school. Most of the time, they would home practice whatever they have learnt during the session and they would often do it individually or together with other friends.

“...Schoolwork is mainly about copying and writing, while these exercises in the book are very easy to read and write. Schoolwork is not easy, here, we laugh and have fun together” [Participant 3, age 10].

“...The exercises, they were easy. On one side, they help us to express ourselves better, both through the workbook exercises and verbally when we talk during the class session” [Participant 6, age 13].

The home practice particularly helped children who were shy to participate in sessions:

“...Even if we face some difficulties in expressing ourselves verbally during the class, we can express ourselves by writing on the workbook. We can write things that we think about, feel or things that we like. We can write them if we cannot talk about it [Participant 6, age 13].

Moreover, the illustrations within the workbook were helpful for those who had learning difficulties:

“...Sometimes I have reading difficulties, but I managed to read because we would read through the exercises during class session and then it was easier for me to read again by myself and answer. Also, we usually do our homework among friends and we often help each other if we face any difficulties [Participant 5, age 13].

“...I got a little bit difficulty in reading only, as I have some reading difficulties, but the pictures in the workbook helped me better understand the concepts” [Participant 8, age 13].

6.4.2.4. Theme 7: Time Constraints

In relation to the session activities, the facilitator experienced time constraints, suggesting that it may not always be possible to carry out all activities in the workbook. Hence, main goals and activities were prioritised for each session, while ensuring that the activities were culturally adapted to the Mauritian context. As suggested in the manual, the SSL programme, can be applied with flexibility and certain activities are optional. The task was to ensure that the pivotal activities in all sessions were made enjoyable and knowledge transfer made effective. To ensure that time duration of the session was managed effectively, nametags, seating arrangements, required materials were prepared ahead of time. Before commencing a session, focus was laid on group rules and group cohesion (e.g. one person talks at a time, make use of hand stick to speak in turns).

Children also expressed time constraints to complete their super tasks at home:

“...I could work most of them. However, I did not manage to finish all of them because I had school and tuition work to complete and I did not have enough time” [Participant 3, age 10].

Hence, time management skills were discussed with the participants to ensure that they managed their time effectively.

6.4.2.5. Theme 8: Effectiveness of Video Feedback

Both quantitative and qualitative data provide support for the effectiveness of video feedback through the video speech tasks assessing behavioural anxiety. Table 19 shows the behavioural changes in the 2-minute speech task recorded at session 1 and session 8. There was a significant difference in scores for all the behavioural items assessed. Specifically, the analysis shows that there was a significant improvement for behavioural indicators of length of gaze, vocal quality, length of speech and conversation flow (all $ps < .001$). Additionally, scores for manifestation of discomfort in children were significantly reduced in session 8 ($p < .001$).

Table 19.

Means, standard deviations and t-tests of behavioural indicators

<i>Video recorded Speech Tasks</i>	<i>Session 1</i>	<i>Session 8</i>	<i>t</i>
Behavioural Indicators	<i>M (SD)</i>	<i>M (SD)</i>	
<i>Gaze</i>	1.69 (.62)	2.58 (1.13)	-4.58***
<i>Vocal Quality</i>	2.39 (.84)	3.97 (.70)	-12.98***
<i>Length</i>	2.56 (.94)	4.06 (.83)	-8.75***
<i>Conversation</i>	2.31 (.92)	4.00 (.63)	-16.29***
<i>Discomfort</i>	2.58 (.94)	4.03 (.77)	-10.28***

Note. *** $p < .001$

The speech tasks allowed the stimulation of the children's emotional and social behaviour and triggering positive changes in the children's behaviour. Children displayed high levels of motivation and enthusiasm for using video recorded tasks. Analysis of qualitative data in relation to video recorded speech tasks indicated that video feedback during the sessions 1 and 8 has enabled learning via positive self-modelling and it seemed to have facilitated the

generalisation and implementation of new skills learnt such as effective communication, positive interaction with peers and improved self-esteem.

Staff expressed that they were impressed with the technique of video feedback and they noticed how it had helped the children in learning new skills and enhancing their self-esteem:

“...before I was having difficulty in expressing myself. I am telling you; I would not talk much to others, I was rude to others, and I would never share my feelings with others. When I did the video about myself, I find myself able to talk. After the video, I found myself better able to express and talk with others” [Participant 7, age 11].

“...I think the skills learnt will improve my self-esteem. I will have a better self-esteem, for example, later in life we might have to talk in front of an audience and having done the videos like we did in this programme has given us more confidence in ourselves. We should not be shy to speak in front of others now. We should keep thinking about positive thoughts” [Participant 8, age 13].

Overall, the qualitative analysis suggested that staff and young people found the SSL content and techniques to be acceptable and feasible. Participation in the SSL proved to be a positive experience that taught them skills that they could use immediately and they intend to continue using them in the future. Hence, evidence for acceptability and feasibility also proved the cultural adaptation of the SSL intervention in the Mauritian context while maintaining the completeness of therapeutic elements of the SSL intervention.

6.4.3. Research Question Three:

Is the use of the SSL intervention experienced as useful by the Mauritian children in RCIs and are there any perceived barriers to implementation?

6.4.3.1. Theme 9: User Satisfaction

Children and staff reported high user satisfaction after each session (mean scores ranging between 5.7 and 6.9 (7 being the highest score; Table 20). Qualitative data also suggested a positive satisfaction from children and staff following the SSL intervention. Children were particularly satisfied with learning new SSL concepts that helped them deal with their emotional and social difficulties. Children acknowledged that the SSL was especially beneficial to children living in RCIs due to their difficulties in emotion regulation:

“...I think it’s important that we learn things about ourselves, our feelings, how to deal with our problems and deal with different situations in life. Also, how to recognize our different emotions and feelings that we have. I think it is a very good programme. This will help me a lot in my life [Participant#1, age 14].

“...I am very happy with this programme. It is very useful. I think it will be helpful if all children receive this programme. It will help them deal with their emotions and feelings, especially when we are in shelters (RCIs). Many times we do not know how to react to angry emotions or sad emotions, so I think that the skills we learnt during the sessions will help everyone” [Participant#6, age 13].

The staff expressed that they noticed a positive impact of the intervention with a greater confidence in children, with a boost in their emotional wellbeing. Children living in RCIs have their own personal history of maltreatment or abandonment, which often make them vulnerable to emotional and social difficulties. The SSL equipped the children with adequate skills that helped them shape their behavioural, social, communication and emotional skills.

“...Children will better understand their emotions and feelings through this programme. Also, they will be able to communicate better and talk well with others. Doing

the videos will help them as well. They might be shy at the beginning but once they do it, they will be able to speak in front of other people” [Staff#4].

“...When children face problems in their home, like they have been physically abused, they come in shelters (residential care) and most of the time, they are not able to return home, maybe because their parents do not want to take them back, or they are at risk of further harm with those parents. Hence I think that this programme about emotional resilience has definitely helped them. Children are now better able to understand their feelings and emotions and be able to relax through the techniques taught. They are getting the encouragement and understand their situation better” [Staff#3].

Children also expressed that they found doing the SSL in small groups very useful, instead of doing it individually or in larger groups.

“...This programme is good when it’s done in a small group, not a big group, not too many children in it” [Participant#1, age 14].

Children also reported satisfaction with the activities involved during the sessions. Doing the activities in group of friends and sharing their knowledge and experience allowed the children to reinforce their social and communication skills. They felt comfortable with their peers and this improved their social competence.

“...When we did the role plays on friendly and unfriendly behaviour, we did the activities in groups, we developed our role plays, our sketches and we enacted them in front of the rest of the group. It was real fun. We got to share a lot. We learnt a lot from our friends as well. Many of us expressed a lot in class sessions, we were really interested in participating” [Participant#6, age 13].

“...We felt happy working together and doing the activities together. We joked, we enjoyed, we discussed with each other and with you. We have good fun. Remember when you were passing the ball, and the one who receives the ball had to talk, it was great fun. Everyone wanted the ball” [Participant#7, age 11].

Table 20.

User Satisfaction questions

	Did you like the session?	Did you participate in the session?	Did you learn anything new in this session?
Child groups	6.8	6.5	6.9
Staff group	6.6	5.7	6.8

6.4.3.2. Theme 10: Perceived Barriers

Some of the perceived barriers expressed by children related to difficulties in applying the skills learnt. For example:

“...it is often difficult to find solutions to my problems sometimes” [Participant#2, age 9].

“...sometimes I do not know why I feel so sad” [Participant#5, age 13].

This demonstrated that the effectiveness of the SSL was also dependent on personal and external factors, that is, on children’s perceived emotional states and challenges outside the sessions. Some of the challenges also relate to doing the super tasks at home.

“...but if I have to practice these exercises at home, I might get disturbed by the girls A, B and C, not really D. They are very noisy. When I learn or want to do something quietly,

they always disturb me. But I can and prefer working and doing activities with friends who are in other houses, I feel good with them” [Participant#1, age 14].

Staff expressed that barriers to implementation can relate to some young children with low mental capacity experiencing difficulty in practising the skills outside the sessions. They also argued that some caregivers’ perceptions on mental health and on children living in RCIs may impact the participants’ adherence to the skills learnt. Children may feel intimidated and suppress their emotions once again. However, overall, perceived barriers were expressed to be minimal given that the SSL sessions were taking place within the children’s environment where children feel safe and secure in their surroundings and are already acquainted with their group of friends.

6.4.3.3. Theme 11: Ideas for Improvement

Children stated that they would like to have more SSL sessions on a regular basis whereby they will get to learn of new concepts that will help them in their daily lives. They felt that only 8 sessions were not enough. They felt the need to learn more about their thoughts, feelings and behaviours.

“...We have already completed the workbook but we can continue the sessions as we need to talk more. This will help us” [Participant#5, age 13].

“...I will like to have more sessions. Even if the sessions in the workbook are over, I would like to have more sessions. This will help us a lot as we do not have such sessions here. This was our first time” [Participant#1, age 14].

“...I think if we get more sessions, it will be great. You can teach us new concepts and new things which will be helpful for us. Also, if we can include more activities with role plays, it will help as well. Then, children will learn different types of behaviours because

sometimes they do not know how to react in certain situations and through role plays they can learn a lot” [Participant#6, age 13].

Children also recommended the programme to all children and adolescents in the RCIs given that they face emotional difficulties on a regular basis. They averred that older adolescents not within the age range of the programme may also benefit from the programme.

“...If we talk about the things that we learnt during the sessions, children will be more interested in doing the programme. Children in all residential institutions should do this programme. They will be happy. This will help them as lot” [Participant#7, age 11].

“Older children have much more understanding, they are mature. They need all these sessions to help them in their lives. I am not saying that young children should not receive it, but I think it will be very helpful to elder children, like my age. Younger and older ones should be in separate groups” [Participant#1, age 14].

6.4.4. Research Question Four:

Does there appear to be an impact of the SSL intervention on emotional problems (anxiety/depression) at post-intervention and at follow-up?

Prior to conducting analyses, data were checked for outliers or extreme scores on all outcome measures. Data were found to be normally distributed at each time point (pre-intervention: T1, post-intervention: T2 and follow-up: T3). Where the assumption of sphericity was not met for any outcome measures, Greenhouse-Geisser corrections were used. Repeated Measures (ANOVAs) were conducted to investigate the influence of time (T1, T2 and T3) on outcome measures of anxiety and depression, internalising and

externalising problems, adaptive emotion regulation strategies, maladaptive emotion regulation strategies and self-esteem.

6.4.4.1. Outcome Measures at T1, T2 and T3

The mean scores and standard deviations for all main outcome measures are displayed in Table 21 below.

Table 21.

Mean scores for all outcome variables at pre-intervention (T1), post-intervention (T2), and follow-up (T3).

	T1	T2	T3		
Outcome	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>F</i>	η_p^2
<i>SDQ</i>					
Overall externalising scores	12.28 (3.16)	10.72 (3.09)	10.31 (2.54)	9.98***	.22
Conduct problems	5.44 (2.65)	5.24 (2.49)	4.69 (1.64)	1.49	.04
Hyperactivity	6.83 (1.66)	5.58 (1.61)	5.61 (1.68)	12.67**	.27
Overall internalising scores	14.28 (2.57)	12.03 (3.69)	10.61 (2.73)	16.22***	.32
Emotional problems	6.94 (2.23)	6.56 (3.07)	5.14 (1.68)	6.61**	.16
Peer problems	7.33 (1.45)	5.47 (1.75)	5.58 (1.77)	21.16***	.38
Prosocial behaviour	6.03 (2.25)	6.08 (2.29)	6.44 (2.38)	.453	.01
<i>RCADS</i>					
Major depressive Disorder	13.86 (7.56)	11.22 (5.67)	11.14 (5.72)	4.55*	.12
Total Anxiety (5 subscales)	66.81 (29.37)	50.22 (18.60)	49.50 (18.62)	15.83***	.31
Generalised Anxiety Disorder	12.25 (4.63)	8.36 (3.64)	8.78 (4.12)	20.28***	.37

Separation Anxiety Disorder	13.78 (6.76)	9.61 (5.31)	9.64 (5.30)	18.53***	.35
Panic Disorder	13.81 (6.36)	10.31 (5.18)	9.75 (5.19)	12.38**	.26
Social Phobia	16.75 (8.57)	13.42 (5.18)	13.28 (5.02)	6.88*	.16
Obsessive-Compulsive Disorder	10.22 (4.46)	8.53 (3.91)	8.47 (3.84)	4.28	.11
<i>CERQ-k</i>					
Maladaptive ER	52.61 (6.40)	44.19 (10.20)	38.72 (12.36)	26.32***	.43
Self-Blame	12.58 (3.89)	8.97 (4.38)	8.14 (3.66)	16.04***	.31
Rumination	14.61 (2.84)	12.56 (3.87)	11.81 (3.62)	8.30**	.19
Catastrophising	12.69 (3.69)	11.92 (3.67)	10.83 (4.40)	3.17	.08
Other-Blame	12.72 (3.12)	10.75 (3.72)	7.94 (2.90)	22.69***	.39
Adaptive ER	54.11 (11.32)	58.06 (13.15)	65.25 (7.20)	17.96***	.34
Acceptance	10.61 (3.31)	11.72 (3.42)	12.08 (3.65)	2.73	.07
Positive Refocusing	11.56 (3.78)	12.69 (3.61)	14.39 (2.90)	10.66***	.23
Refocus on Planning	10.81 (3.43)	11.92 (3.56)	12.17 (4.44)	1.71	.05
Positive Reappraisal	10.47 (4.13)	10.50 (4.13)	13.14 (3.65)	6.90*	.17
Putting into Perspective	10.67 (3.63)	11.22 (3.41)	13.47 (2.52)	11.98***	.26
Self-Esteem	19.56 (5.70)	22.58 (4.49)	21.06 (2.72)	4.35*	.11

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; SDQ = *Strength and Difficulties Questionnaire*; RCADS = *Revised Children's Anxiety and Depression Scale*; CERQ-k = *Cognitive Emotion Regulation Questionnaire-kids (CERQ-k)*; ER = *Emotion Regulation*.

6.4.5. Impact of the SSL intervention on Outcome Measures

The results of the quantitative statistical analysis for all outcome measures, including strengths and difficulties (SDQ), anxiety and depression (RCADS), emotion regulation strategies (CERQ-k) and self-esteem are described below.

6.4.5.1. Impact of SSL intervention on strength and difficulties (SDQ)

There was a significant main effect of time on the SDQ scores of internalising symptoms of emotional problems and peer problems and externalising symptoms of hyperactivity, but not conduct problems (see Table 21). Bonferroni adjusted pairwise comparisons follow-up tests revealed that emotional problems significantly decreased from T1 to T3 ($p < .001$) and from T2 to T3 ($p < .05$), but not from T1 to T2 ($p = .59$). Peer problems significantly decreased from T1 to T2 to T3 over time (all $ps < .001$). Hyperactivity also significantly decreased from T1 to T2 ($p < .01$), and T1 to T3 ($p < .01$), but not from T2 to T3 ($p = .97$). There was no significant effect of time on prosocial scores ($p = .51$)

6.4.5.2. Impact of SSL intervention on anxiety and depression (RCADS)

A significant main effect of time emerged on the RCADS scores of total anxiety, which significantly decreased from T1 to T2 to T3 over time (all $ps < .001$). Specifically, symptoms of generalised anxiety, separation anxiety, panic and social phobia significant decreased from T1 to T2 ($ps < .05$) and from T1 to T3 ($ps < .05$), but these symptoms did not decrease from T2 to T3 ($ps > .05$). There was no significant effect of time on obsessive-

compulsive symptoms ($p > .05$). While there was a significant change in children's levels of depression over time, no significant Bonferroni pairwise comparisons emerged ($ps > .05$).

6.4.5.3. Impact of SSL intervention on emotion regulation strategies (CERQ-k)

A significant main effect of time emerged on maladaptive emotion regulation (ER) strategies of self-blame, rumination and other-blame. Specifically, the maladaptive ER strategies of self-blame, rumination and other-blame significantly decreased from T1 to T2 ($ps < .05$) and from T1 to T3 ($ps < .001$). While strategy of other-blame also significantly decreased from T2 to T3 ($p < .01$), no significant effect emerged for self-blame and rumination strategies. No significant effect of time on maladaptive ER strategy of catastrophising was found ($p > .05$).

Furthermore, a significant main effect of time also emerged on the adaptive ER strategies of positive refocusing, positive reappraisal and putting into perspective. Positive reappraisal and putting into perspective strategies significantly increased from T1 to T3 ($p < .05$) and from T2 to T3 ($p < .05$), but not from T1 to T2 ($p > .05$). The adaptive ER strategy of positive refocusing significantly increased from T1 to T3 only ($p < .001$). No significant effect of time on adaptive ER strategies of acceptance and refocus on planning was found ($ps > .05$).

6.4.5.4. Impact of SSL intervention on Self-Esteem

A significant main effect of time emerged on self-esteem scores. Post-hoc analyses indicated that self-esteem significantly increased from T1 to T2 only ($p < .05$).

6.4.5.5. Theme 12: Impact of SSL on Children

Supporting quantitative data, evidence from the qualitative data also emerged under the theme of impact of the SSL on the children, in relation to empowerment, emotional wellbeing, cognition and trauma-related symptoms.

6.4.5.5.1. Theme 12 [a]: Impact on Children: Empowerment

Wide-ranging changes were reported by most of the children. Children felt empowered following the SSL intervention, whereby they wanted to bring positive changes to themselves and encourage the same in others. Staff received more insight into the emotional difficulties faced by children and especially learnt more about anxiety symptoms:

“...I need to change my bad manners. I need to progress. I am putting the skills into practice. I have to do it. It will be good for me” [Participant#1, age 14].

“...Sometimes we talk badly and rudely to others. We should not do that. We learnt how to respond to others when they talk to us. How to behave nicely and positively. This is helpful to me because earlier I also used to respond rudely to others and I was not very nice to others. So now I am nicer to others when they talk to me” [Participant#3, age 10].

“...We have to tell others about this programme. We have to explain to them what is ‘Super Skills for Life’ programme. We have to learn good skills, skills that will help us. We have to learn good manners. How to talk to others appropriately. We have to use good social habits, for example, saying good morning. We should not use bad words towards others or swear at others” [Participant#2, age 9].

It’s a great programme to learn how to cope with our problems and stress. We talked about anxiety, emotional difficulties which are internal and which is not commonly known or discussed among people” [Staff#3].

6.4.5.5.2. Theme 12 [b]: Impact on Children's Emotional Wellbeing

Changes also reported by children include improved positive feelings, emotions, thoughts, increased awareness of emotions, better management of difficult/negative emotions, better social skills and relationships and understanding the connection of thoughts, feelings and behaviour. Children talked more about internal feelings which used to be suppressed. They are able to evaluate their behaviours and alter them for the better. They expressed not only emotional but also behavioural improvements in themselves such as fighting/arguing less with caregiver, friends, and/or siblings:

“...I do not argue much now...I do not talk aggressively with others, especially with my mother. I do not refute everything that she says now. I listen to her and do what she tells me to do. I am not angry with her anymore: [Participant#2, age 9].

“...Earlier, I used to feel very stressed and tired. Now I feel relaxed, comfortable, happy and everything. I think of my emotions. I understand myself better now, even my sisters and friends. If they are angry or sad, I think there must be something bothering them. I try to help them by talking to them” [Participant#4, age 12].

“...I never used to think about my thoughts or why I am feeling angry. Now I try to find the reason as to why I am feeling angry because I should know why I am feeling angry and not be rude to others. If I know why I am angry then I won't be angry towards others for no reason” [Participant#3, age 10].

Improvements reported by staff related to children being happier in general, feeling less anxious, less sad, happier to go to school, better social interaction and better communication skills. They also expressed improvements in relation to their own thoughts and actions:

“...It reminds us to keep in mind that all children are different. They all behave differently, express differently and have different thoughts. So, we have to understand their behaviours first and then try to help them deal with issues being experienced” [Staff#1].

Staff also reported that children seemed to display behavioural changes, that is, not only reduced negative behaviours (such as anger outbursts and peer problems), but they seemed to have developed new, positive ways of interacting with others, and a desire to share what they had learned with other children. This was seen as surprising to the staff, given the degree of difficulty that these children faced in their daily lives due to their history of maltreatment:

“...For instance, X has not displayed much issues lately in relation to anger, violence or being out of control. On the contrary, I have seen him wanting to engage with people, communicate to people in effective forms, asking questions, being a lot more curious, talking about how he would do, solve a problem if he had one to do with this or, and you know, just letting go of the past issues” [Staff#5].

6.4.5.5.3. Theme 12 [c]: Impact on Children’s Cognition

Children reported an increased ability to think, reason and alter their unhelpful thoughts. They also reported being better able to notice changes in their emotions and their cognitive reactions. They expressed better self-awareness to their feelings, thoughts and actions and being able to recognise how other people see them. Hence, after the SSL intervention, they were able to recognise their mental strengths and challenges experienced.

“...I can change my thoughts by thinking more positive things about myself”
[Participant#5, age 13].

“...I need to stay positive. I have to think about helpful thoughts, not think too much about unhelpful thoughts. If someone is saying something about some other person or talking

about another person, we should not automatically think that the person is talking about us. We should not take everything badly. We have to take things positively” [Participant#2, age 9].

“...When someone is looking at me, I will not think bad or negative about them. Also, it helps us not to think negatively about others. Every time, I think that friends are talking about me, but this may not be true. They might be talking good things about me, not necessarily bad things about me. Or they may be talking about something else and laughing about it” [Participant#3, age 10].

Children also expressed altruism whereby they increasingly thought about how the SSL can be used to help others who are experiencing emotional difficulties.

“...Let’s not end the programme. Don’t let the children fall back into sadness or depression; help them overcome their problems, help them stand up. Do not let them feel bad about themselves, lift them up; make them feel better about themselves [Participant#7, age 11].

6.4.5.5.4. Theme 12 [d]: Impact on Children’s Trauma-related symptoms

An important theme that was generated is that children reported a reduction in their trauma-related thoughts after the SSL intervention, and that the traumatic event that had made them come to live in the RCI was now being viewed as part of the past. Moreover, children were able to stop stigmatising others in relation to their personal life experiences. They seemed to display an acceptance of their past, and their struggles were much lesser:

“...I can now think of my biological parents without feeling bad. I know I am in RCI for my own good” [Participant#8, age 13].

“...We all are here because we have faced difficulties at our family’s place. So, we should not laugh at others or we should not tease others because of the abuse problem that they had faced in the past” [Participant#5, age 13].

“...Whatever happened to me is the past now. I do not want to go to my parents’ place because life is not good there. I am happy here” [Participant#4, age 12].

“...Earlier I used to think that no one will understand me, so I did not used to share my feelings. But now I feel that I have to look forward and stop thinking of things that troubled me” [Participant#1, age 14].

6.5. Discussion

To the best of knowledge, this is the first study to examine the cultural adaptation, acceptability and feasibility of a transdiagnostic intervention programme for emotional problems among children living in RCIs in Mauritius. This study utilised a mixed-method design to evaluate the overall intervention acceptability and feasibility and to explore participants’ responses to the novel intervention components of the SSL. The study, hence, examined the qualitative data derived from the sample and addressed the research questions with the support of quantitative data.

The first goal of the study was to evaluate the feasibility of the intervention in terms of recruitment, attendance, attrition, response rates to data collection and the manner in which the intervention outcomes were measured. Overall, the results obtained indicate that implementation fidelity within these domains was high. The identification of children who may benefit from an early intervention programme in the RCI was the first step to recruitment feasibility. RCI staff identified children with emotional difficulties and all identified children consented to participation. The retention method was positively received with all participants retained at 6-weeks follow-up post the SSL intervention. Most of the

participants attended all the sessions of the intervention protocol. All the participants were present for the data collection phase as well, however, some could not complete the questionnaires due to time constraints. Hence, attrition level was very low with high attendance to sessions and data collection. The manner in which the intervention outcomes were measured was found to be acceptable and feasible. The reason of implementation feasibility and fidelity could relate to the fact that the intervention was carried out within the natural setting of the home environment of the child. Moreover, at post-intervention interviews, the participants expressed that they were relatively enthusiastic about the programme which was a newly added 'concept' to their daily lives at the RCI which will enhance their emotional wellbeing. Their group dynamism and growing curiosity to learn more about the SSL skills increased session after session. These positive fidelity findings may be beneficial to the effectivity of the SSL intervention.

The second goal of the study examined the cultural adaptation, acceptability and feasibility of the SSL intervention in terms of treatment adherence and engagement to the SSL workbook content and techniques used. This study seemed to be in line with the recent call for adaptations of evidence-based interventions to be more localised and specific to the culture and context (Castro-Camacho et al. 2018). The SSL was implemented while being cognizant of cultural, contextual, religious and other factors related to children living in RCI in Mauritius. Culturally-sensitive translation of the resources of the programme (e.g. the manual, workbook and outcome measures) was ensured to make sure that conceptual meanings were not lost in the process of translation and implementation. Culturally-relevant proverbs, idioms and syndromes were acknowledged and used during the sessions. This adaptation can serve as adaptive cognitive sets to interpret reality that promote positive affect and serve as primers to adaptive functioning and wellbeing (Hinton & Patel, 2017).

All the participants completed their workbook, super tasks (homework) and the video speech tasks. Even those who missed any SSL session completed their tasks before the next scheduled session, thereby displaying adherence to completing the SSL tasks. Children also expressed time constraints in completing their tasks at home due to external factors such as noise disturbance and difficulty in concentration at home. However, children seemed to peer-tutor their friends at home who had reading or writing difficulties and worked on the super tasks while helping each other. The majority of the participants assessed the SSL activities such as role-plays and techniques as applicable and helpful, especially the techniques of relaxation, problem-solving and cognitive restructuring, which children appeared to be implementing in their daily functioning. The novel technique of video feedback was proven to be feasible and acceptable given that there were significant improvements in children's behavioural indicators of anxiety after the SSL training. These findings indicate that the SSL contents and techniques were acceptable and feasible, thereby showing good engagement in the programme.

The third goal of the study examined the usefulness of the programme and the perceived barriers to implementation. Regarding participants' and staff's sense of usefulness of the programme, they reported a strong endorsement of the programme, with both personal (children) and professional usefulness (staff). Both participants and staff reported high satisfaction with the programme, highlighting the acceptability of delivering this type of intervention in an RCI setting. These findings are promising, as interventions that are viewed favourably by key staff are more likely to be sustainable (Rapee, Wignall, Sheffield et al., 2006). This feasibility study supports the use of qualitative methods to evaluate new evidence-based interventions in a new population and new context by allowing key RCI staff to describe their views of the programme (Campbell, Fitzpatrick, Haines et al., 2000).

Some of the perceived barriers to implementation related to difficulties in the application of the SSL skills learnt. For children, the difficulties pertained to their personal problems acted as barriers preventing them in applying the skills to self. Staff reported that children may have difficulty in understanding and applying the skills due to their young age or due to learning difficulties they have. Moreover, they felt that caregivers' prejudice or stigma towards children in RCIs may hinder the proper application of the SSL skills at home. Ideas for overcoming such barriers were suggested by both participants and staff, including implementing more SSL sessions or continuous weekly sessions whereby children are exposed to new skills. This could benefit children in dealing with ongoing emotional and/or social difficulties. A national preventative approach in implementation of the SSL programme was also proposed whereby all children in RCIs from different age ranges could benefit from the programme. The intensity of the eight sessions of the SSL was considered to be appropriate given that the programme targets emotional symptoms and involves techniques and skills to regulate emotional difficulties. Booster sessions can be added at the end of the SSL sessions to help increase the transfer and application of the SSL skills. Indeed, CBT-based interventions with booster sessions have been found to evidence more effectiveness and sustainability over time (Gearing, Schwalbe, Lee et al., 2013).

The last goal of the study examined the preliminary effects of the SSL intervention on outcome measures of emotional problems at post-intervention and at follow-up. As a feasibility study, the study was not powered to include a control group and detect group differences in outcomes as the study aimed to examine how feasible were the measures in assessing the intervention outcome. The intervention outcome measures were found to be acceptable and feasible. At both post-SSL intervention and follow-up, preliminary indication of significant improvements was found in internalising symptoms of emotional and peer problems, externalising symptoms of hyperactivity and anxiety disorders of generalised

anxiety, separation anxiety, panic and social phobia. Significant reductions were also noted for the maladaptive emotion regulation strategies of self-blame, other-blame and rumination while significant improvements were noted for adaptive emotion regulation strategies of positive refocusing, positive reappraisal and putting into perspective. These findings were particularly significant at follow-up, suggesting that children with emotional problems were more likely to continue practising and implementing the SSL skills and techniques over time. This finding is in line with previous studies that found significant improvements for anxious children in care emerging at longer-term follow-up (Chavira, Drahota & Stein, 2014; McGrath, Lingley-Pottie, Thurston et al., 2011).

The results of the qualitative data contributed to a better understanding of the impact of the intervention on children. Children felt empowered following the SSL intervention, whereby they felt positive changes in their emotional wellbeing. They expressed an increase in positive emotions and feelings, amelioration in social skills and problem-solving skills and cognitions. Staff reported increased knowledge and understanding of emotional difficulties faced by children and techniques that can be used to help children overcome these difficulties. Furthermore, changes were also reported regarding the handling of complex emotional situations. Some participants reported feeling more distant from the traumatic event that caused them to live in the RCI and accepted it more as part of their personal history. Correspondingly, a reduction in trauma-related thoughts, negative cognition and a decrease in avoidance behaviour were reported. These findings are consistent with previous studies that demonstrated particularly strong effects of CBT-based techniques on symptoms of avoidance and maladaptive cognitions (Banks, Newman, & Saleem, 2015; Martinsen et al., 2016).

The SSL intervention also seemed to have an impact on the externalising symptoms of hyperactivity. Trauma frequently manifests as affecting behaviour in children (Perry,

2003), and many children in care often display disruptive behaviour symptoms (Copeland et al., 2007). As sessions progressed, children reported an increase in awareness and ability to self-regulate emotions, hence, children's behaviour problems would have decreased as a result of the skills learned. Consistent with this finding, children also reported an increase in coping skills and more adaptive cognitive appraisals in the qualitative interviews. The current findings are consistent with findings that were presented in Smith, Yule, Perrin et al. (2007) and Spinazzola, Rhodes, Emerson et al. (2011). Overall, this study assessed the feasibility of the SSL intervention programme, with findings suggesting that the eight sessions of the SSL could lead to an array of positive effects in children living in RCIs. The findings indicated the feasibility of implementing a culturally-adapted and contextually-adapted preventive intervention programme in the RCI settings in Mauritius. This feasibility study also emphasises that this intervention is worth testing more rigorously in a subsequent randomised controlled trial.

6.6. Limitations

This feasibility study had certain limitations that should be addressed and it provided avenues for future research. A limitation of the study was the lack of a control group. Given that this study focused on promoting emotional resilience among vulnerable children living in RCIs in the LMIC of Mauritius, assigning children to a control group while denying them participation to an intervention was determined to be unethical. It was of utmost importance that an intervention group study allowed for initial evidence for the implementation of the SSL programme, following which future studies can include randomised controlled trials with waiting-list control groups. The finding of the study indicated that most of the significant changes were sustained at follow-up, six weeks after the intervention. Future research should investigate whether the changes would continue to be maintained over a

longer period of time; or even more importantly, how the change would be sustained after the intervention was completed. Moreover, this study included a relatively small sample of children and was conducted in only two RCIs. Future research should replicate this study with a larger sample and increased number of RCIs. Despite the limitations, the statistically significant positive effects of the SSL provided preliminary evidence of the SSL implementation methods used in this study. The results of this feasibility study should inform the development and implementation of a future definitive randomised controlled trial to evaluate SSL intervention efficacy.

6.7. Future Recommendations for SSL intervention

Cultural adaptation of CBT-based programmes has been recommended for its application in non-western cultures (Rathod, Phiri, Harris et al., 2017; Naeem, Latif, Mukhtar et al., 2020). There is growing evidence of the effectiveness of culturally adapted interventions to improve mental health treatment in local context (Li et al., 2017; Rathod et al., 2018; Naeem et al., 2019). It is important to make adjustments to how an intervention is delivered, through the lens of cultural awareness, knowledge and skills of a given culture, without compromising the theoretical underpinnings of the intervention (Naeem, 2012). To assess the feasibility of the SSL programme in the Mauritian culture, different areas of local cultural competence were taken into consideration. Some important lessons have been learned from this feasibility study which are thereby recommended for consideration in future SSL intervention research in Mauritius. Firstly, an awareness of the cultural knowledge of the local context is required in relation to the belief systems related to wellbeing and help-seeking in times of distress. People often use cultural, religious or spiritual coping strategies when dealing with distress and this may also give rise to myths and stigma associated with mental illness. During the preparation and implementation of the intervention, it is important

to raise awareness and address local myths and stigmatization of mental illness and help-seeking. Secondly, it is essential to consider local language dynamics and barriers and make appropriate linguistic adaptations. Given that words associated with mental health problems are limitedly used in Mauritius, it was important to make use of cultural proverbs, idioms and colloquialisms. Moreover, linguistic and semantic appropriateness during the linguistic translation of the SSL ensured that the semantic meaning of words be culturally relevant, with the text content being simplified phrasing and wording. Thirdly, being aware of the above factors can guide a culturally sensitive assessment, engagement and technical adjustments in the intervention. The recruitment and assessment processes involved in the feasibility study were found to be socially and culturally acceptable. Local stories, folklore games and role plays were introduced in the SSL sessions to promote engagement. These activities were adapted to the Mauritian culture and they were used to ensure that the cognitive, emotional, behavioural and physiological experiences of the children are accentuated. Technical adjustments involved adjustments of the mode and manner of the intervention implementation. For example, in the feasibility study, children participated in the SSL programme within their home environments, unlike other SSL studies which were conducted in school settings. Adjustments were also made to the length of the SSL sessions, whereby an additional 15 minutes were allocated at the end of each session to ensure if children had any questions related to the taught SSL concepts and skills. The additional time allocation was also used to help children with the SSL super tasks (homework), given that some children had reading and writing difficulties. Overall, these fundamental areas of cultural competence and technical adjustments to the SSL intervention may help the cultural adaption of the SSL. The current feasibility study was conducted to determine whether the adapted SSL intervention programme was acceptable to the Mauritian RCI context. A larger

RCT study is warranted to determine the effectiveness of the SSL in promoting the emotional resilience of children in Mauritius.

6.8. Conclusions and Summary

This is the first feasibility study of an evidence-based intervention programme for emotional problems among children in RCIs in the LMIC of Mauritius. The findings of the study have demonstrated that the SSL can be successfully implemented in a new culture, context and population, that is, Mauritian children living in RCIs. The study's mixed-method data provide tentative empirical support for the cultural adaptability and implementation fidelity for the SSL programme and the use of a clinical trial for evaluating the efficacy within this population and context is further warranted. The study offers the potential to help eliminate the gap in mental wellbeing of vulnerable children in residential care in Mauritius. While taking into account the findings of this feasibility study, the next chapter will implement a randomised controlled trial to investigate the effectiveness of the SSL in reducing symptoms of emotional problems.

Chapter 7: Study 4:

Effectiveness of the Super Skills for Life programme in enhancing the emotional wellbeing of children and adolescents in residential care institutions in Mauritius: A randomised waitlist-controlled trial

7. Overview

This chapter builds upon the findings of the feasibility study (Chapter 6) that indicated that the implementation of the SSL intervention programme was acceptable and feasible through its cultural adaptation to the new population of children in RCIs in Mauritius. The present study thus aimed to examine the effectiveness of the transdiagnostic SSL programme among the children and adolescents with emotional problems in using a randomised waitlist-controlled trial. It also aimed to assess risk factors that predict the intervention outcome.

7.1. Introduction

The prevalence of emotional problems among the vulnerable population of children and adolescents in RCIs is particularly high, ranging from 49% to 88% (Bronsard et al., 2016; Burns et al., 2004; Jozefiak et al., 2016), which is clearly higher than the 13.4% prevalence among the general young population (Polanczyk et al., 2015). These children have experienced unfavourable life experiences and family circumstances such as maltreatment, poverty or separation from parents/families (Bronsard et al., 2011; Sainero, Bravo & Del

Valle, 2014). Research has shown clear evidence that these adverse early life conditions often jeopardize psychological functioning and leave young people with increased risk of emotional problems such as anxiety and depression (Segura et al., 2016). It could also lead to maladaptation and impairments in multiple life domains, not only in childhood, but adulthood as well (Greger et al., 2015; Ramiro et al., 2010). Indeed, evidence indicates that the more these adverse conditions are left untreated, the more probable are negative life outcomes and heightened risk of developing full-blown mental health disorders later in life (Essau et al., 2014a; Raviv, Taussig, Culhane et al., 2010). As described in previous chapters, emotional problems can have lasting detrimental effects in children and adolescents and these problems are more likely to be maintained by certain risk factors such as difficulties in central components of executive functioning and emotion regulation (Berking et al., 2014; Han et al., 2016; Kertz et al., 2016).

So far, the findings of the studies carried out in this thesis (Study 1 and 2), while adding support to previous research, have also highlighted the particular need for early effective intervention support for children and adolescents. Trauma-focused CBT (TF-CBT; Cohen et al., 2006) is one of the evidence-based treatment approach often implemented among children and adolescents in care in HICs (Graham & Johnson, 2019). TF-CBT is often used among young people as an intervention to help break down difficult trauma memories in managing negative emotional and behavioural responses resulting from their experiences. Although this intervention has provided effective results in RCTs (Cohen, Deblinger & Mannarino, 2016), its direct applicability to the residential care population can be complex and difficult (Knoverek, Briggs, Underwood et al., 2013). For instance, many children dropped out of treatment as they found the therapy unhelpful, especially the trauma narrative component (Dittmann & Jension, 2014; Salloum, Dorsey, Swaidan et al., 2015). Moreover, a significant increase in PTSD severity had been reported among both intervention and control

groups, following narrative exposure therapy (Crombach & Elbert, 2015). The adverse effects interventions can cause are worrying. In fact, a recent systematic review found high inconsistencies in the cultural adaptation of TF-CBTs (Ennis, Shorer, Shoval-Zuckerman et al., 2019).

Likewise, internet-based interventions have collected empirical evidence for effectiveness, accessibility and scalability in HICs (Ebert et al., 2017; Choi et al., 2015; Romero-Sanchiz et al., 2017). However, these interventions have been found to be less effective on cultural and ethnic minority groups (Benish et al., 2011; Karyotaki et al., 2018). Arguably, evidence-based interventions require cultural adaptation, whereby a process of adjustment to language, culture and context is made that is congruent with the linguistic and cultural patterns, meanings and values of the target population (Bernal et al., 2009). For example, when interventions not specifically developed for children in care, were firstly adapted and then evaluated via randomised effectiveness trials, they were found to be more effective in reducing emotional problems than the non-adapted interventions (McDaniel, Braiden, Onyekwelu et al., 2011; Mersky, Topitzes, Grant-Savelle et al., 2014). A meta-analysis of 78 studies evidenced that culturally-adapted interventions produce substantially better mental health outcomes than other conditions (such as other interventions or no intervention) (Hall, Ibaraki, Huang et al., 2016). Adapting interventions to the residential care context demonstrates sensitivity to the needs of this unique population (Hambrick, Oppenheim-Weller, N'zi et al., 2016). Hence, given the vulnerability of the residential care population, cultural adaptation of CBT-based interventions is warranted while considering community-specific cultural contexts of risk and resilience that can influence emotional problems (Lau, 2006).

Evidence of quantitative synthesis of RCTs indicates that resilience-building interventions that combine CBT techniques with resilience training promote individual

resilience and overall emotional wellbeing (Joyce, Shand, Tighe et al., 2018). Resilience building can help protect mental health and promote recovery from adversity. For instance, adolescents in RCIs were reported as being more vulnerable and presenting more distress symptoms as compared to peers in alternate care, however, having higher levels of resiliency were associated with better outcomes (Chia & Lee, 2015; Lou, Taylor & Di Folco, 2018). So far, it has been noted that transdiagnostic CBT-based interventions may be beneficial for young people in care in HICs, however such interventions are limited and complex without proper adaptation to the target population in LMICs (Pluck, Banda-Cruz, Andrade-Guimaraes et al., 2015). As such, effectiveness of evidence-based practice in residential care is uncommon (Dixon, Biehal, Green et al., 2013; Watters & O’Callaghan, 2016).

The UK’s Medical Research Council framework for complex interventions suggests that before a definitive trial is conducted, a feasibility study should be carried out to identify potential challenges or difficulties and to refine the trial design and the intervention under evaluation by addressing the faced challenges. This is particularly relevant here, given the complexities of the intervention evaluation in a new setting, context and population. Chapter 6 described the findings of Study 3 of this thesis that evidenced the acceptability and feasibility of the resilience-building intervention programme, SSL, through a cultural and contextual adaptation for children and adolescents in RCIs in Mauritius. The study also proved the feasibility of undertaking a definitive trial to evaluate the effectiveness of the SSL programme in preventing emotional problems among this population.

To the best of knowledge, the present study is the first to investigate the effectiveness of a preventative programme for emotional problems among young people in RCIs through a randomised waitlist-controlled trial (RCT). Based on recent promising findings of SSL (see Table 14) and the support of the feasibility of SSL in the residential care context in Mauritius (Study 3), it was aimed to examine whether there would be any changes in emotional

problems among children and adolescents in RCIs after participating in SSL programme as compared to the control group (b) and to identify whether demographic variables such as gender and age influence treatment outcomes. It was hypothesised that at both post-treatment and 3-month follow-up, compared to those in a waitlist-control group, children and adolescents who participate in SSL would demonstrate: (1) improvements in primary outcomes of internalising (e.g. anxiety and depressive symptoms) and externalising (e.g. conduct problems and hyperactivity) symptoms, (2) improvements in secondary outcomes of cognitive emotion regulation strategies, attentional bias and inhibitory control and (3) gender effects on treatment outcomes.

7.2. Methods

7.2.1. Participants

One-hundred eligible participants from six RCIs were advanced to the trial (see Figure 3 for CONSORT Flow Chart). According to an a priori power analysis using G*Power software (Faul et al., 2007), a sample size of 86 children was necessary to detect a medium-sized effect of 0.3 (power = .80; alpha = .05) (Cohen, 1988). However, considering that attrition rate during an intervention phase can be approximately 10% (e.g. García-Escalera et al., 2016; Johnson et al., 2016), the minimum number of participants required was deemed to be 96 participants.

Participants in the study were predominantly female (76%) and aged between 9 to 14 years ($M = 11.75$, $SD = 1.97$). All participants were Mauritian nationals and self-reported ethnic groups were Creole (73%), Hindu (24%) and Muslim (3%). Length of living in the RCIs ranged from 2 to 10 years ($M = 5.86$, $SD = 2.63$), however, no significant differences emerged between length of living across the six RCIs, $\chi^2(15) = 9.14$, $p = .87$. Half of the

participants lived with their siblings in the same RCI. All the children/adolescents had been placed in the RCIs due to childhood maltreatment.

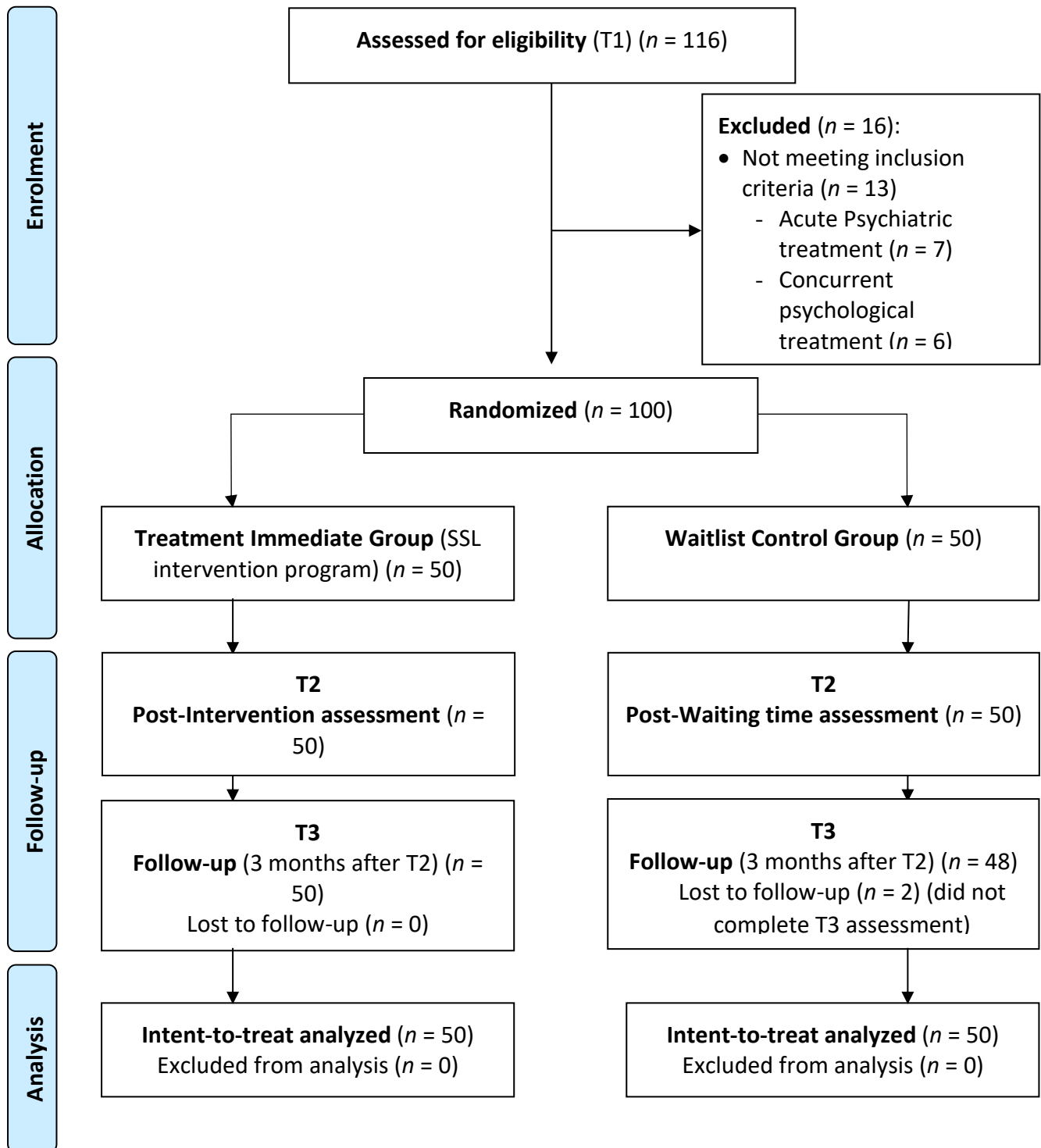


Figure 3: CONSORT Flow Diagram for the RCT

Participants met the following inclusion criteria: (a) RCI report on child/adolescent displaying difficulties in managing emotions or emotional distress; (b) aged 9 to 14 years; and (c) willingness to attend assessments and SSL sessions. While a clinical cut-off for emotional problems as an inclusion criterion was not used for this study, all the participants at baseline assessment displayed moderate to high levels of emotional distress ($M = 5.77$, $SD = 2.71$), as indicated by scores greater than 5 on the Emotional Symptoms subscale of the self-report *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997), which are considered to indicate elevated risks of anxiety and/or depression (Goodman, 2001). In line with international recommendations, the cut-off scores at and above 5 to determine severity of emotional problems have also been analysed in Study 2 of this thesis and thereby recommended for use among the Mauritian sample. The exclusion criteria included: (a) serious risk of harm to self or others; (b) undergoing active psychiatric treatment and/or concurrent psychological treatment; or (c) in the process of leaving the RCI.

7.2.2. Lessons from the Feasibility study and Modifications made to the SSL

Intervention for the RCT

Following the feasibility research, while the original components of the SSL programme were maintained, slight modifications to the SSL in the RCT (e.g., conceptual meanings, language expressions, examples, games) were made in order to facilitate understanding and improve the SSL adaptation to both the Mauritian culture and the context of vulnerable population of children in RCIs (see Table 22 below).

Table 22.

Lessons from the Feasibility study and Modifications made to the SSL Intervention for the RCT

<p>Fully feasible for the RCT</p>	<p>1. The recruitment process:</p> <ul style="list-style-type: none">• Prior to commencing the trial, a number of meetings were held with senior authorities from RCI to ensure they understood what was required and to establish their wish to participate in the study.• At senior management level of the RCIs, there seemed to be an appreciation of the value of research, especially following the feasibility study.• They acknowledged the potential benefits of the study, in terms of providing young people in RCIs with better skills in managing their emotions and building their emotional resilience.• Staff had no difficulty in identifying and referring children with emotional difficulties for the study. <p>2. Intervention Outcome measures:</p> <ul style="list-style-type: none">• The procedure of data collection through the intended outcome measures for the definitive trial were found feasible in the feasibility study.
<p>Modifications required to the SSL in the RCT</p>	<p>1. The cultural adaptation of the SSL content and techniques done in the feasibility study was transported for use in the RCT:</p> <ul style="list-style-type: none">• A mixed-language (French and Creole) was found more appropriate for the verbal implementation of the SSL so as to ensure conceptual meanings of key concepts were retained.

	<ul style="list-style-type: none"> • Culturally-relevant proverbs, idioms and syndromes were also applied in the SSL intervention of the RCT. • To raise awareness and address stigmatisation of mental illness, participants were encouraged to verbalise their thoughts, feelings and behaviours. • Session on relaxation techniques was carried out in the natural environment of the RCI (i.e. garden). • An additional 15 minutes was allocated at the end of each session to ensure that children understood the concepts taught and managed to complete the homework of last session. • The second half session on social skills training was carried out in real-world settings, that is, social encounters were encouraged with staff and children from other houses in the RCIs. • Games used in the sessions were amended to include Mauritian folklore games (see Table 22). • Children received training on the missed sessions before the next subsequent session.
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7.2.3. Measures

In order to assess the effects of the intervention, children completed a set of questionnaires and experimental tasks before and after the SSL, and at an average of 3 months after the intervention. The self-report questionnaires were chosen because they have been used widely in numerous countries with children and adolescents and have been proven to have strong psychometric properties (e.g., Panter-Brick et al., 2011).

7.2.3.1. Primary Outcomes

Emotional and behavioural difficulties and positive attributes

The *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997; see Appendix 9) and impact supplement were used to measure children's general difficulties (emotional symptoms, conduct problems, hyperactivity and peer problems) and positive attributes (prosocial behaviour). Subscales were combined to measure overall internalising behaviours, overall externalising behaviours, total difficulties and total impact of these difficulties on their everyday lives. In the present study, the Cronbach's alpha values were .54 for the overall internalising behaviours scale, .68 for the overall externalising scale, .71 for the total difficulties scale, and .84 for the total impact scale. Subscale alpha values ranged from .38 for the peer problems subscale to .70 for the emotional symptoms subscale. The official translation for the French version of the SDQ was used in the present study (<http://www.sdqinfo.com/b3.html>).

Anxiety and Depression

The *Revised Children's Anxiety and Depression Scale* (RCADS; Chorpita et al., 2000; see Appendix 17) of 47 items measured DSM-IV relevant symptoms of anxiety disorders (generalised anxiety disorder, separation anxiety disorder, panic disorder, social phobia, obsessive compulsive disorder, and total anxiety disorders) and major depressive disorder. In the present study, the Cronbach's alpha value for the total anxiety disorders scale was .92 (with subscale alpha values ranging from .50 for the obsessive-compulsive disorder subscale to .81 for the panic disorder subscale) and for the major depressive disorder scale, it was .80. The official translation for the French version of the RCADS was used in the present study (<https://www.childfirst.ucla.edu/resources>).

Behavioural indicators of anxiety were measured through the video speech tasks at session 1 and 8 using a rating system developed by Fydrich et al. (1998) and later modified for use with children (Essau et al., 2019) This rating system(see Appendix 20) has been used in several studies that showed significant reductions in behavioural indicators of anxiety among children and adolescents who have participated in the SSL programme (Essau et al., 2014b; 2019; de la Torre-Luque et al., 2020). All the videos were rated (offline) from very poor/low to very good/high on length of eye gaze, vocal quality, length of speech, manifestation of discomfort, and conversational flow (Essau et al., 2014b, 2019).

7.2.3.2. Secondary Outcomes

Cognitive Emotion Regulation strategies

The *Cognitive Emotion Regulation Questionnaire–kids version* (CERQ-k; (Garnefski et al., 2007; see Appendix 18) measured cognitive emotion regulation (ER) strategies that children use in response to their experience of threatening or stressful life events. The CERQ-k consists of nine subscales, with four items in each. Four of the subscales measure maladaptive ER strategies (self-blame, rumination, catastrophising and other-blame) and five subscales measure adaptive ER strategies (acceptance, positive refocusing, planning, positive reappraisal and putting into perspective). Higher scores indicated more pronounced use of the ER strategy. In the present study, the Cronbach's alpha values for the maladaptive ER strategies ranged from .52 (other-blame) to .61 (self-blame), and for the adaptive ER strategies, they ranged from .50 (acceptance) to .62 (positive refocusing).

The English version of the CERQ-k was adapted and translated according to guidelines for the successful translation of instruments in cross-cultural research (Brislin, 1970). One bilingual translator who was also a native speaker blindly translated the

questionnaires from the original language (English) to French, and another bilingual individual translated them back to the original language. Differences in the original and the back-translated versions were discussed and resolved by joint agreement of both translators.

Self-Esteem

The *Rosenberg Self-Esteem Scale* (RSE; Rosenberg, 1965; see Appendix 19) measured children's global self-esteem. The Cronbach's alpha value for the RSE in the present study was .65. The official translation for the French version of the RSE was used in the present study (Vallières & Vallerand, 1990).

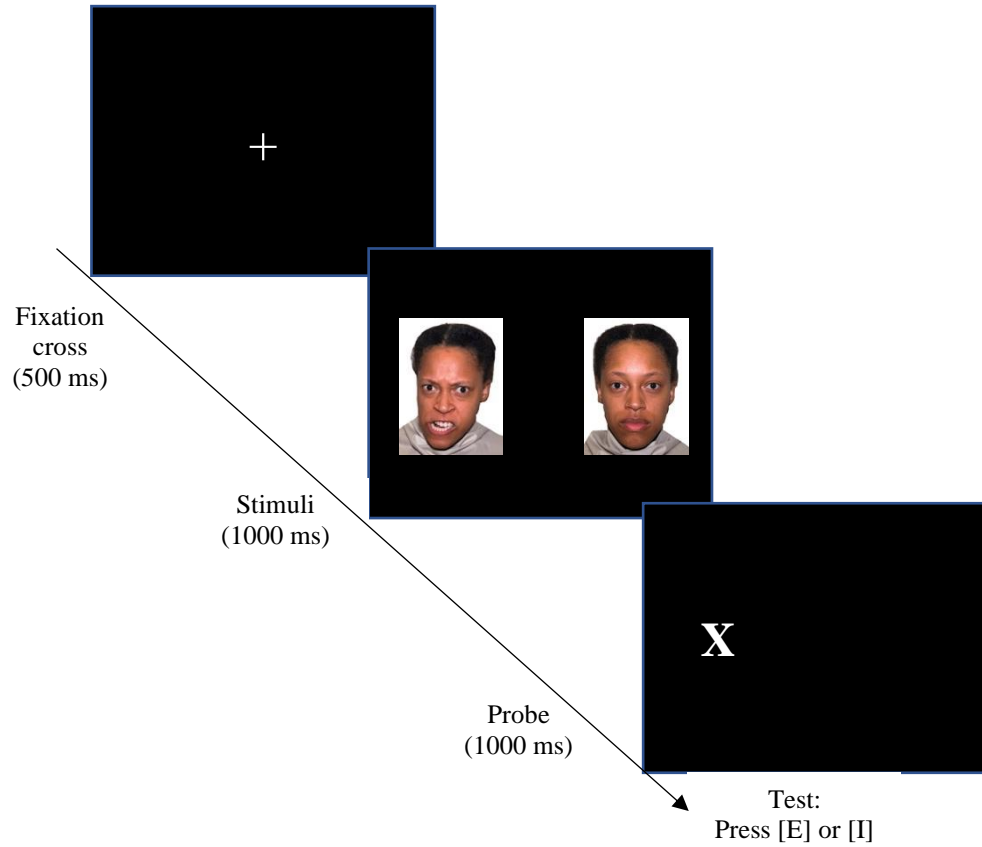
Attentional Bias

To measure attentional bias, an Emotion Dot-Probe task was used. Twelve adult models (six females) with resemblance to the Mauritian ethnic groups were selected from the NimStim face set (Tottenham et al., 2009). Pictures of the same face portrayed angry, happy and neutral facial expressions and were presented horizontally in angry-neutral, happy-neutral and neutral-neutral pairings across congruent and incongruent conditions. Each emotional face picture was presented 4 times in a pseudorandom order across the congruent and incongruent conditions. Figure 4 displays the sequence of an incongruent and a congruent trial.

Reaction time (RT) and accuracy of responses were recorded. Only children's bias towards threat-related stimuli was used in further analyses. The task consisted of a practice block (10 practice trials) and a test block (144 trials – 48 trials with angry faces, 48 trials with happy faces and 48 filler trials with neutral faces). Trials with short (<200ms) and long (>2000ms) reaction times (RTs) and outlier trials (i.e. Z-scores outside $\pm 2.5 SD$ of mean bias scores) were excluded (Tabachnik and Fidell, 2013). Attentional bias is calculated by

subtracting scores of congruent trials from incongruent trials. Positive scores indicate a bias towards threat, whereas negative scores indicate a bias away from threat. Bias scores that are zero (or near zero) reflect no bias.

Congruent Trial



Incongruent Trial

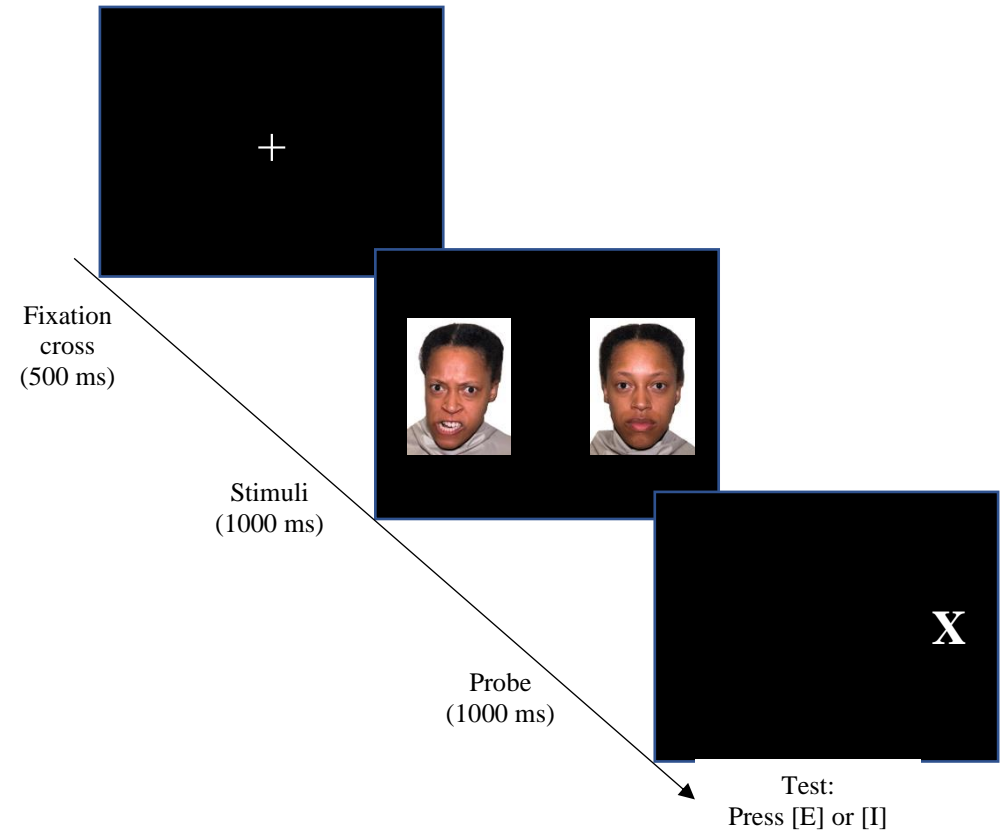


Figure 4: Emotion dot probe task

Inhibitory Control

Inhibitory control was assessed through a modified version of the flanker task (Eriksen and Eriksen, 1974) adapted for children (Christ et al., 2011). Participants were instructed to pay attention to the orientation (right or left) of the central fish (target). The other fish (flankers) were oriented either in the same direction (congruent trial) or in the opposite direction (incongruent trial). Children were instructed to report the direction of the central target by pressing left or right response keys. There were 3 blocks of 120 trials in total (2 practice blocks and 1 test block) with 1-minute resting time between blocks. Trials with errors, and responses shorter than 200ms or longer than 3000ms, were removed from analyses. Accuracy across incongruent trials was recorded as a measure of inhibitory control (Rueda et al., 2005).

7.2.4. Procedure

Following institutional ethical approval, RCIs across Mauritius were assessed for eligibility of participation. Within the 17 RCIs in Mauritius, 5 RCIs catered only for children under age 7 or above age 18 and one RCI catered only for children and young adults with severe disabilities. Out of the 11 eligible RCIs invited to participate, 6 RCIs gave approval for participation, all of them from different sub-regions of Mauritius. The six RCIs were from both urban and rural areas across Mauritius, with mixed gender children and adolescents up to age 18. Half of the institutions were run by the government and the other half were run by NGOs who work in close collaboration with the government. Occupancy in the six RCIs ranged from 65% to 111%, with one RCI operating in excess of capacity.

Following informed consent from the respective authority of the RCIs and prior to the commencement of the study, children were also asked for their verbal consent. They were

given consent information with details about the aims and importance of the research, the potential risks of harm and the voluntary nature of this research. Importantly, it was highlighted to the children that confidentiality and anonymity would be assured and the right to withdraw from the study would be respected.

After informed and verbal consent, all eligible participants completed baseline assessments, after which they were randomly assigned to either a treatment immediate (intervention group; IG) or waitlist-control (WLC) group; hence this was a two-arm randomised, waitlist-controlled trial. Blocked randomisation, stratified by RCI, was performed to balance the group sizes in each condition at each RCI. A block size of six and an allocation ratio of 1:1 were specified. The trial included three assessment time-points: baseline (T1; one week before the IG started the intervention); post-intervention (T2; one week after the IG finished the intervention); and follow-up (T3; three months after the IG finished the intervention). The WLC group received the intervention approximately 5 months after the intervention group (IG) started the intervention (8-week waiting period between T1 to T2 [while the IG received the intervention] and 3 months follow-up period from T2 to T3). All experimental tasks were completed online, which were completed individually by each child with one of the residential carers present.

The SSL programme was delivered by one facilitator, who was a developmental psychologist with 5 years of experience in working with children with mental health problems in Mauritius. During the delivery of the SSL, the facilitator was assisted by one staff member of the RCI. Data collection was done by a research assistant (a Psychology graduate in Mauritius) who was blind of the condition allocation of the children. Weekly supervisions were provided by the lead author of the SSL to address any implementation concerns. Adherence to the SSL manual was monitored by completion of session-specific checklists of all required materials and activities (Garbacz et al., 2014). Adherence to the

intervention content across RCIs was on average 92%. This is similar to the adherence levels of 78% to 97% as reported in previous studies (Essau et al., 2012).

7.2.5. Data analyses

To ensure equivalence of the IG and WLC group following randomisation and prior to treatment, the groups were compared on demographic and baseline measures using chi-square tests and *t*-tests. A series of General Linear Model analyses were then conducted with the intent to treat (ITT) sample. Controlling for baseline scores as covariates (T1), one-way between-groups analysis of covariance (ANCOVA) tests were carried out for each of the outcome variables to compare differences between groups (IG vs. WLC) at T2 and T3 separately. The use of ANCOVAs has been advocated when analysing randomised pretest, posttest, follow-up designs and controlled trials due to its superior statistical power, precision, and ability to control for any pre-treatment group differences (Rausch et al., 2003; Vickers & Altman, 2001). Gender effects on the treatment outcomes were also analysed using a mixed-ANOVA analysis. For attentional bias, one-sample *t*-tests were performed to compare scores on the dot-probe task against zero.

7.3. Results

Prior to conducting analyses, data were inspected and no significant departures from statistical assumptions were detected. Listwise deletion was used to address the few missing data (2%) at T2 and T3. Levene's tests were significant for some of the ANCOVA analyses, which indicates possible violations of the homogeneity of variance assumption. However, when group sizes are equal, *F*-tests are fairly robust to this violation (Blanca et al., 2018), so no adjustments to these analyses were deemed to be necessary. To control the familywise error rate of multiple analyses, the Bonferroni-Holm method (Holm, 1979) for adjusted *p*-

values was used. Results were defined as significant if the unadjusted p -values were less than or equal to the Bonferroni-Holm corrected p -value.

7.3.1. Pre-treatment comparisons

Prior to intervention, no significant associations were found between the groups and participants' gender, ethnicity, age groups, number of years in RCIs, living together with siblings and type of child maltreatment (all $ps > .05$; see Table 23). No significant differences ($ps > .05$) emerged on most of the primary and secondary outcome measures at baseline, except for the ER strategies of self-blame [$t(98) = 2.21, p = .03, d = .44$] and planning [$t(98) = 2.21, p = .03, d = .44$], and hyperactivity symptoms [$t(98) = 2.91, p = .01, d = .58$], and prosocial behaviour [$t(98) = 2.47, p = .02, d = .50$]; these were all significantly higher in the IG than the WLC group. Moreover, in relation to attentional bias, the IG had higher accuracy in incongruent trials than the WLC group at baseline [$t(98) = 2.08, p = .04, d = .42$]. Since even small and non-significant group differences in outcome variables at baseline can have a confounding effect in RCT analyses (Twisk et al., 2018), these preliminary analyses confirmed the need for including T1 outcome variables as covariates.

Table 23.

Participant demographics and characteristics by treatment group at randomisation

	Intervention Group (<i>n</i> = 50)	Waitlist-Control Group (<i>n</i> = 50)	χ^2	<i>df</i>	<i>p</i>
	%	%			
Age groups			4.67	2	.10
8 – 10 years	24	40			
11 – 13 years	44	44			
14 -15 years	32	16			
Gender (female)	74	78	.22	1	.64
Nationality					
Mauritian	100	100	-	-	-
Other	-	-			
Ethnicity			.62	2	.73
Creoles	76	70			
Hindu	22	26			
Muslim	2	4			
Number of years in RCI			4.34	3	.23
< than 1 year	-	-			
2 – 4 years	32	42			
5 – 7 years	36	30			
7 – 10 years	22	10			
> than 10 years	10	18			
Together with sibling(s) in RCI (yes)	60	40	4.01	1	.46
Type of abuse on admission to RCI			7.91	5	.16
Sexual abuse	10	16			
Physical abuse	10	2			
Child neglect	32	32			
Child at risk	34	22			
Abandonment	12	18			
Child trafficking	2	10			

7.3.2. Primary Treatment Outcomes

Unadjusted pre-/post-intervention and follow-up mean comparisons for all outcomes are reported in Table 24. The results of covariance-adjusted post-intervention and follow-up mean comparisons, along with effect sizes for each outcome variable, can be found in Table 25 and are summarised below.

Table 24.

Unadjusted means for all outcome variables at pre-intervention (T1), post-intervention (T2), and follow-up (T3)

Outcome	Intervention Group			Waitlist-Control Group		
	Pre	Post	Follow-up	Pre	Post	Follow-up
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<i>SDQ</i>						
Emotional problems	6.20 (2.78)	5.28 (2.38)	4.60 (2.44)	5.34 (2.58)	6.42 (1.70)	7.10 (1.88)
Conduct problems	5.12 (2.07)	3.88 (1.35)	3.72 (1.29)	4.90 (2.21)	5.50 (1.07)	5.46 (1.01)
Hyperactivity	6.04 (1.83)	5.32 (1.49)	5.86 (1.55)	5.00 (1.75)	6.54 (1.46)	7.54 (1.13)
Peer problems	6.50 (1.68)	6.52 (1.73)	5.90 (1.49)	6.30 (2.26)	6.28 (2.22)	6.66 (1.67)
Prosocial behaviour	7.26 (2.03)	7.58 (2.18)	7.32 (2.77)	6.24 (2.10)	5.22 (1.04)	5.04 (0.82)
Overall externalising scores	12.56 (2.56)	12.54 (1.01)	12.78 (0.68)	11.50 (2.72)	14.42 (2.33)	15.88 (0.85)
Overall internalising scores	10.94 (3.82)	8.66 (3.92)	8.36 (4.03)	10.68 (4.04)	14.40 (1.20)	15.04 (1.31)
Total difficulties (without prosocial behaviour)	23.10 (5.50)	21.20 (4.16)	21.14 (4.15)	21.58 (5.97)	28.82 (3.44)	30.92 (2.10)
Total impact scores	6.06 (3.72)	2.66 (2.30)	2.88 (2.29)	5.20 (3.64)	7.96 (1.59)	8.88 (0.85)
<i>RCADS</i>						
Generalised Anxiety Disorder	10.16 (4.18)	7.30 (1.49)	8.26 (2.59)	9.56 (3.98)	14.50 (2.49)	14.56 (3.57)
Separation Anxiety Disorder	9.40 (4.71)	6.02 (2.66)	9.04 (4.11)	8.84 (5.49)	16.06 (3.88)	14.58 (4.66)
Panic Disorder	9.88 (5.73)	8.04 (3.35)	8.90 (2.84)	9.36 (6.56)	19.22 (2.96)	17.16 (3.98)
Social Phobia	13.70 (5.25)	8.78 (4.07)	9.74 (4.07)	13.64 (6.32)	18.34 (4.58)	15.78 (5.45)
Obsessive Compulsive Disorder	10.08 (3.57)	6.28 (3.06)	6.64 (3.57)	9.04 (3.52)	12.66 (1.70)	12.98 (2.39)
Total anxiety (5 subscales)	53.22 (19.89)	36.50 (9.21)	40.44 (12.52)	50.10 (22.34)	85.88 (11.29)	72.48 (22.06)
Major Depressive Disorder	11.16 (6.43)	6.14 (2.90)	7.06 (3.08)	11.10 (6.15)	19.10 (2.67)	20.36 (2.31)
<i>Behavioural assessment of anxiety</i>						
Gaze	2.65 (.75)	3.88 (.63)	N/A	2.29 (.90)	3.78 (.86)	N/A
Vocal Quality	2.71 (.82)	4.00 (.76)	N/A	2.25 (.87)	3.69 (.88)	N/A
Length	2.53 (.92)	3.92 (.79)	N/A	2.12 (.91)	3.73 (.70)	N/A

Conversation flow	2.67 (.92)	4.06 (.80)	N/A	2.12 (1.00)	3.86 (.72)	N/A
Discomfort	2.59 (.84)	4.08 (.71)	N/A	1.96 (.85)	3.75 (.69)	N/A
<i>CERQ-k</i>						
<i>Maladaptive ER</i>						
Self-blame	10.66 (3.97)	5.90 (1.49)	5.46 (1.31)	8.98 (3.62)	10.74 (2.19)	11.12 (2.74)
Rumination	12.26 (3.81)	10.38 (2.06)	10.14 (2.43)	11.10 (3.66)	15.48 (2.69)	14.74 (2.96)
Catastrophising	11.00 (3.80)	8.46 (2.93)	7.04 (1.97)	11.22 (3.70)	14.46 (2.29)	14.22 (2.74)
Other-blame	10.70 (3.55)	6.56 (2.20)	5.90 (2.17)	9.48 (3.49)	10.52 (2.38)	10.84 (2.47)
<i>Adaptive ER</i>						
Acceptance	9.30 (2.83)	11.90 (2.12)	12.90 (2.43)	10.48 (3.27)	8.64 (1.98)	6.34 (1.68)
Positive Refocusing	13.12 (3.87)	15.14 (2.39)	15.70 (2.57)	12.94 (3.55)	11.88 (2.57)	12.86 (2.85)
Refocus on Planning	13.14 (3.74)	14.78 (2.54)	15.16 (2.99)	11.62 (3.12)	9.20 (2.58)	8.14 (2.73)
Positive Reappraisal	12.16 (3.69)	15.40 (3.09)	15.34 (2.40)	11.58 (3.74)	11.12 (2.90)	9.84 (2.91)
Putting into Perspective	11.42 (3.26)	11.68 (2.39)	11.74 (2.51)	11.46 (4.14)	13.12 (3.76)	12.58 (3.36)
Self-Esteem	22.74 (4.67)	25.18 (2.48)	25.40 (1.96)	23.86 (4.16)	26.00 (3.15)	26.8 (2.64)
<i>Emotion Dot-Probe task (Attentional Bias)</i>						
Congruent trials						
RT	556.18 (96.07)	517.55 (87.89)	523.64 (83.90) ^a	552.33 (112.37)	552.89 (117.87) ^b	550.26 (96.58) ^a
Accuracy (%)	80.48	80.83	78.00 ^a	75.13	76.22 ^b	73.16 ^a
Incongruent trials						
RT	538.33 (102.31)	528.27 (93.74)	542.48 (79.24) ^a	549.53 (109.70)	555.38 (108.56) ^b	538.02 (111.89) ^a
Accuracy (%)	82.17	82.12	79.63 ^a	73.97	76.65 ^b	71.79 ^a
Attentional bias (RT)	-10.42 (92.30) ^b	2.49 (28.67)	10.41 (51.74)	-9.13 (117.53) ^b	-26.23 (79.80) ^a	30.07 (66.65)
AB away from threat (RT)	-68.95 (62.57)	2.10 (28.79)	3.95 (20.41)	-77.24 (102.01)	-50.00 (80.93)	20.41 (64.45)
AB towards threat (RT)	78.91 (47.03)	3.12 (29.25)	20.97 (42.24)	71.37 (77.44)	4.18 (68.48)	41.41 (68.83)
<i>Child Flanker task (Inhibitory Control)</i>						
Congruent trials						

RT	859.93 (257.35)	778.95 (203.55)	731.96 (170.13)	861.20 (258.53)	839.24 (195.68)	870.56 (245.48) ^b
Accuracy (%)	86.97 (15.76) ^a	93.17 (9.32) ^a	92.86 (9.60) ^a	86.77 (11.63) ^b	84.39 (13.65) ^b	85.36 (12.75) ^b
Incongruent trials						
RT	910.45 (290.78) ^b	814.11 (190.81) ^b	827.66 (224.66) ^a	980.39 (312.75) ^a	907.15 (210.22) ^a	981.44 (305.79) ^a
Accuracy (%)	79.91 (19.69) ^a	86.94 (14.88) ^a	88.91 (13.64) ^a	75.95 (19.33) ^a	73.50 (19.46) ^a	76.32 (16.11) ^a

Note. SDQ = Strength and Difficulties Questionnaire; RCADS = Revised Children's Anxiety and Depression Scale; CERQ-k = Cognitive Emotion Regulation Questionnaire-kids (CERQ-k); ER = Emotion Regulation; RT = Reaction Time; AB = Attention Bias; ^a*n* = 49; ^b*n* = 48.

Table 25.

Covariance-adjusted means and standard errors with Bonferroni-Holm corrected ANCOVA results for all outcome variables (ITT analyses) at post-intervention (T2) and follow-up (T3), controlling for pre-intervention (T1) scores

Outcome	Post-intervention						Follow-up					
	Intervention Group	Waitlist-Control Group	<i>F</i>	<i>df</i>	<i>p</i>	η_p^2	Intervention Group	Waitlist-Control Group	<i>F</i>	<i>df</i>	<i>p</i>	η_p^2
	<i>M (SE)</i>	<i>M (SE)</i>					<i>M (SE)</i>	<i>M (SE)</i>				
<i>SDQ</i>												
Emotional problems	4.80 (0.30)	6.40 (0.30)	14.43	1, 97	< .001	.13	4.62 (0.31)	7.08 (0.31)	30.92	1, 97	< .001	.24
Conduct problems	3.88 (0.17)	5.50 (0.17)	43.80	1, 97	< .001	.31	3.71 (0.16)	5.47 (0.16)	60.23	1, 97	< .001	.38
Hyperactivity	5.25 (0.21)	6.61 (0.21)	20.15	1, 97	< .001	.17	5.87 (0.20)	7.53 (0.20)	33.90	1, 97	< .001	.26
Peer problems	6.42 (0.08)	6.38 (0.08)	0.18	1, 97	.672	.002	5.88 (0.22)	6.68 (0.22)	6.48	1, 97	.013	.06
Prosocial behaviour	7.52 (0.24)	5.28 (0.24)	40.95	1, 97	< .001	.30	7.25 (0.28)	5.11 (0.28)	28.07	1, 97	< .001	.22
Overall externalising scores	12.33 (0.21)	14.63 (0.21)	57.47	1, 97	< .001	.37	12.77 (0.11)	15.89 (0.11)	391.28	1, 97	< .001	.80
Overall internalising scores	8.66 (0.41)	14.40 (0.41)	97.20	1, 97	< .001	.50	8.36 (0.43)	15.04 (0.43)	123.01	1, 97	< .001	.56
Total difficulties (without prosocial behaviour)	21.17 (0.54)	28.85 (0.54)	98.85	1, 97	< .001	.51	21.23 (0.46)	30.83 (0.46)	217.26	1, 97	< .001	.69
Total impact scores	2.66 (0.28)	7.96 (0.28)	175.08	1, 97	< .001	.64	2.91 (0.24)	8.85 (0.24)	294.06	1, 97	< .001	.75

RCADS

Generalised Anxiety Disorder	7.28 (0.29)	14.53 (0.29)	315.20	1, 97	<.001	.77	8.25 (0.44)	14.58 (0.44)	101.92	1, 97	<.001	.51
Separation Anxiety Disorder	6.06 (0.46)	16.02 (0.46)	231.00	1, 97	<.001	.70	9.09 (0.61)	14.53 (0.61)	39.72	1, 97	<.001	.29
Panic Disorder	8.06 (0.45)	19.20 (0.45)	311.60	1, 97	<.001	.76	8.92 (0.49)	17.14 (0.49)	142.05	1, 97	<.001	.59
Social Phobia	8.78 (0.62)	18.34 (0.62)	120.34	1, 97	<.001	.55	9.74 (0.68)	15.78 (0.68)	39.02	1, 97	<.001	.29
Obsessive Compulsive Disorder	6.24 (0.35)	12.75 (0.36) ^a	167.87	1, 96	<.001	.64	6.66 (0.43)	13.07 (0.43) ^a	109.02	1, 96	<.001	.53
Total anxiety (5 subscales)	36.53 (1.47)	85.79 (1.49) ^a	552.76	1, 96	<.001	.85	40.56 (2.55)	72.28 (2.58) ^a	76.11	1, 96	<.001	.44
Major Depressive Disorder	6.14 (0.39)	19.10 (0.39)	547.13	1, 97	<.001	.85	7.06 (0.39)	20.36 (0.39)	596.83	1, 97	<.001	.86
<i>Behavioural assessment of anxiety</i>												
Gaze	3.79 (0.09)	3.87 (0.09)	0.48	1, 97	.490	.01	N/A	N/A	N/A	N/A	N/A	N/A
Vocal Quality	3.89 (0.10)	3.79 (0.10)	0.46	1, 97	.502	.01	N/A	N/A	N/A	N/A	N/A	N/A
Length	3.77 (0.08)	3.77 (0.08)	0.003	1, 97	.955	.00003	N/A	N/A	N/A	N/A	N/A	N/A
Conversation flow	3.97 (0.09)	3.95 (0.09)	0.03	1, 97	.856	.0003	N/A	N/A	N/A	N/A	N/A	N/A
Discomfort	3.91 (0.09)	3.89 (0.09)	0.02	1, 97	.884	.0002	N/A	N/A	N/A	N/A	N/A	N/A
<i>CERQ-k</i>												
<i>Maladaptive ER</i>												
Self-blame	5.89 (0.27)	10.74 (0.27)	159.29	1, 97	<.001	.62	5.54 (0.31)	11.05 (0.31)	159.24	1, 97	<.001	.62
Rumination	10.38 (0.34)	15.48 (0.34)	109.33	1, 97	<.001	.53	10.14 (0.39)	14.74 (0.39)	69.68	1, 97	<.001	.42
Catastrophising	8.51 (0.37) ^a	14.44 (0.37)	132.73	1, 96	<.001	.58	7.07 (0.34) ^a	14.21 (0.34)	218.95	1, 96	<.001	.70

Other-blame	6.52 (0.33)	10.56 (0.33)	75.04	1, 97	<.001	.44	5.91 (0.33)	10.83 (0.33)	107.89	1, 97	<.001	.53
<i>Adaptive ER</i>												
Acceptance	11.89 (0.29)	8.65 (0.29)	59.64	1, 97	<.001	.38	12.94 (0.30)	6.30 (0.30)	243.14	1, 97	<.001	.72
Positive Refocusing	15.14 (0.35)	11.88 (0.35)	42.65	1, 97	<.001	.31	15.71 (0.38)	12.85 (0.38)	27.94	1, 97	<.001	.22
Refocus on Planning	14.83 (0.37)	9.15 (0.37)	116.61	1, 97	<.001	.55	15.19 (0.41)	8.12 (0.41)	144.10	1, 97	<.001	.60
Positive Reappraisal	15.36 (0.42)	11.16 (0.42)	49.67	1, 97	<.001	.34	15.32 (0.38)	9.86 (0.38)	104.17	1, 97	<.001	.52
Putting into Perspective	11.68 (0.45)	13.12 (0.45)	5.19	1, 97	.025	.05	11.74 (0.42)	12.58 (0.42)	1.98	1, 97	.162	.02
Self-Esteem	25.17 (0.40)	26.01 (0.40)	2.14	1, 97	.147	.02	25.46 (0.33)	26.77 (0.33)	8.24	1, 97	.005	.08
<i>Emotion Dot-Probe task (Attentional Bias)</i>												
Congruent trials												
RT	518.17 (12.81)	552.25 (13.08) ^b	3.46	1, 95	.066	.04	524.02 (12.51) ^a	549.89 (12.51) ^a	2.14	1, 95	.147	.02
Accuracy (%)	80.00 (0.02)	77.00 ^b (0.02)	0.80	1, 95	.374	.01	77.00 ^a (0.03)	74.16 ^a (0.03)	1.18	1, 95	.280	.01
Incongruent trials												
RT	532.06 (12.54)	551.43 (12.80) ^b	1.17	1, 95	.283	.01	545.25 (13.16) ^a	535.26 (13.16) ^a	.287	1, 95	.593	.003
Accuracy (%)	81.00 (0.02)	77.80 (0.02) ^b	1.12	1, 95	.292	.01	79.40 (0.03) ^a	72.00 (0.03) ^a	2.98	1, 95	.088	.03
Attentional bias (RT)	2.74 (8.06) ^b	-22.21 (8.06) ^b	4.80	1, 93	.031	.05	11.36 (8.13) ^b	27.31 (8.13) ^b	1.93	1, 93	.168	.02

AB away from threat (RT)	2.20 (10.43) ^c	-44.21 (11.01) ^d	9.35	1, 52	.004	.15	4.13 (11.20) ^c	20.66 (11.83) ^d	1.03	1, 52	.315	.02
AB towards threat (RT)	2.39 (12.26) ^e	4.82 (11.40) ^f	0.02	1, 38	.885	.001	19.22 (11.35) ^e	37.90 (10.55) ^f	1.45	1, 38	.236	.04
<i>Child Flanker task (Inhibitory Control)</i>												
Congruent trials												
RT	779.11 (26.72)	839.07 (26.72)	2.52	1, 97	.116	.03	731.03 (29.18)	871.53 (29.78) ^b	11.35	1, 95	.001	.11
Accuracy (%)	93.14 (1.55) ^a	84.43 (1.56) ^b	15.67	1, 94	<.001	.14	92.84 (1.59) ^a	85.38 (1.61) ^b	10.88	1, 94	.001	.10
Incongruent trials												
RT	814.11 (23.85) ^b	893.83 (23.60) ^a	3.86	1, 94	.052	.04	838.68 (36.02) ^b	969.17 (35.65) ^a	6.58	1, 94	.012	.07
Accuracy (%)	85.87 (1.98) ^a	74.57 (1.98) ^a	16.18	1, 95	<.001	.15	88.21 (1.91) ^a	77.02 (1.91) ^a	17.16	1, 95	<.001	.15

Note. SDQ = Strength and Difficulties Questionnaire; RCADS = Revised Children's Anxiety and Depression Scale; CERQ-k = Cognitive Emotion Regulation Questionnaire-kids (CERQ-k); AB = Attentional Bias; ER = Emotion Regulation; RT = Reaction Time; ^a*n* = 49; ^b*n* = 48; ^c*n* = 29; ^d*n* = 26; ^e*n* = 19; ^f*n* = 22; Figures in bold indicate statistical significance after Bonferroni-Holm corrections for 79 separate analyses.

Table 26.

Results of ANOVAs, means and standard deviations of the treatment outcomes in terms of gender.

Outcome	Pre-test		Post-test		Follow-up		<i>F</i>	<i>df</i>	<i>p</i>	η_p^2
	Male	Female	Male	Female	Male	Female				
	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)				
<i>SDQ</i>										
Emotional problems	5.15 (2.85)	6.57 (2.70)	7.15 (1.68)	3.78 (1.97)	6.46 (2.44)	3.68 (2.11)	14.46	2, 96	<.001	.23
Conduct problems	5.77 (2.28)	4.89 (1.97)	5.22 (1.94)	3.03 (1.22)	5.01 (1.88)	3.08 (1.23)	1.96	2, 96	.146	.039
Hyperactivity	8.38 (2.71)	6.27 (1.84)	6.38 (1.99)	5.32 (1.60)	5.33 (1.71)	5.54 (1.57)	24.57	2, 96	<.001	.34
Peer problems	7.68 (2.35)	7.05 (1.72)	7.88 (2.24)	6.99 (1.52)	7.75 (1.87)	7.16 (1.71)	.347	2, 96	.708	.007
Prosocial behaviour	6.69 (1.25)	7.46 (2.22)	6.08 (2.50)	8.46 (1.82)	6.44 (2.41)	9.49 (2.26)	16.08	2, 96	<.001	.25
Overall externalising scores	14.38 (2.71)	13.32 (2.38)	12.58 (1.56)	12.38 (1.14)	11.54 (1.02)	12.70 (1.77)	26.02	2, 96	<.001	.35
Overall internalising scores	13.66 (4.56)	11.22 (3.87)	13.71 (4.45)	7.14 (3.43)	12.87 (3.58)	6.73 (3.40)	24.36	2, 96	<.001	.34
Total difficulties (without prosocial behaviour)	19.77 (5.93)	24.27 (4.90)	20.30 (4.78)	19.51 (3.52)	19.33 (5.56)	19.03 (3.44)	31.51	2, 96	<.001	.40
Total impact scores	4.85 (3.38)	6.48 (3.78)	5.01 (4.28)	3.84 (3.72)	4.98 (3.76)	2.14 (2.22)	12.40	2, 96	<.001	.21
<i>RCADS</i>										
Generalised Anxiety Disorder	7.54 (4.98)	11.08 (3.49)	6.87 (3.53)	7.49 (1.64)	7.01 (3.45)	7.19 (1.04)	4.12	2, 96	.019	.079
Separation Anxiety Disorder	8.56 (2.77)	10.35 (4.42)	8.62 (2.64)	7.19 (3.86)	6.69 (4.63)	5.11 (2.48)	16.01	2, 96	<.001	.25
Panic Disorder	12.34 (4.75)	11.57 (5.52)	11.53 (3.42)	7.32 (2.65)	11.78 (4.28)	6.81 (3.02)	34.14	2, 96	<.001	.42
Social Phobia	11.92 (5.36)	14.68 (4.92)	12.77 (2.45)	8.35 (4.14)	12.09 (5.32)	7.49 (3.91)	15.09	2, 96	<.001	.24
Obsessive Compulsive Disorder	8.23 (4.11)	10.73 (3.18)	6.28 (3.98)	7.08 (3.19)	6.46 (3.33)	7.32 (3.48)	.225	2, 96	.799	.005

Total anxiety (5 subscales)	48.46 (17.97)	58.41 (18.02)	43.69 (10.94)	33.97 (9.47)	52.38 (9.31)	36.24 (10.71)	19.03	2, 96	<.001	.28
Major Depressive Disorder	9.77 (3.11)	12.35 (6.88)	9.03 (4.32)	6.05 (3.35)	7.54 (4.52)	6.38 (4.33)	8.17	2, 96	.001	.15
<i>CERQ-k</i>										
<i>Maladaptive ER</i>										
Self-blame	8.53 (5.09)	11.41 (3.26)	5.54 (.660)	6.03 (1.67)	5.85 (1.24)	5.32 (1.36)	4.97	2, 96	.009	.09
Rumination	9.69 (4.01)	13.51 (2.86)	10.01 (2.20)	10.22 (2.02)	11.46 (1.81)	10.19 (2.53)	15.48	2, 96	<.001	.24
Catastrophising	7.92 (3.23)	12.11 (3.38)	6.62 (1.71)	9.17 (3.03)	5.62 (.869)	7.58 (2.02)	2.26	2, 96	.110	.046
Other-blame	10.08 (2.78)	10.92 (3.79)	6.69 (1.89)	6.78 (3.73)	4.92 (.954)	6.24 (2.37)	.432	2, 96	.651	.009
<i>Adaptive ER</i>										
Acceptance	8.69 (4.29)	11.11 (2.62)	7.54 (2.07)	9.03 (1.82)	5.31 (1.25)	6.68 (1.71)	.547	2, 96	.581	.011
Positive Refocusing	12.38 (4.01)	13.38 (3.84)	15.62 (1.98)	15.97 (2.52)	17.15 (4.97)	16.01 (2.60)	.759	2, 96	.471	.016
Refocus on Planning	12.15 (4.62)	13.49 (3.39)	16.69 (4.26)	15.29 (2.43)	12.15 (2.03)	16.22 (2.52)	2.74	2, 96	.070	.054
Positive Reappraisal	10.46 (4.65)	12.76 (3.16)	14.77 (2.06)	15.62 (3.39)	14.62 (.961)	15.59 (2.69)	.861	2, 96	.426	.018
Putting into Perspective	10.46 (3.36)	11.59 (3.25)	10.87 (1.76)	12.11 (2.46)	10.93 (1.04)	11.73 (2.51)	.309	2, 96	.735	.006
<i>Child Flanker task (Inhibitory Control)</i>										
Congruent trials (ms)	786.29 (195.90)	885.81 (273.32)	687.96 (141.48)	810.91 (213.73)	743.04 (204.26)	728.06 (159.46)	1.67	2, 96	.194	.034

Incongruent trials (ms)	869.82 (218.45)	957.44 (276.35)	788.94 (193.27)	888.69 (252.18)	821.80 (307.93)	770.07 (175.58)	1.77	2, 96	.176	.036
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Note. SDQ = Strength and Difficulties Questionnaire; RCADS = Revised Children's Anxiety and Depression Scale; CERQ-k = Cognitive Emotion Regulation Questionnaire-kids (CERQ-k); ER = Emotion Regulation; ms = milliseconds.

7.3.2.1. *Emotional and behavioural difficulties and positive attributes*

Scores for emotional problems, conduct problems, and hyperactivity, as well as overall internalising and externalising symptoms, total difficulties and total impact, were significantly lower for the IG than the WLC group at both T2 and T3. Prosocial behaviour scores were found to be significantly higher for the IG than the WLC group at both T2 and T3. No significant SSL effects on peer problems were found at either time-point. Medium to large effect sizes were found for all significant effects, indicating that the SSL reduced most emotional and behavioural difficulties for participants.

7.3.2.2. *Anxiety and depression*

Compared to the WLC group, the IG reported significantly lower scores for generalised anxiety, separation anxiety, panic disorder, social phobia and obsessive-compulsive disorder at both T2 and T3. Large effect sizes were found for all effects, demonstrating that the SSL reduced participants' anxiety and depressive symptoms. However, no significant SSL effects were identified in the behavioural assessments of anxiety.

7.3.3. Secondary Treatment Outcomes

7.3.3.1. *Cognitive Emotion Regulation strategies and Self-Esteem*

All maladaptive ER strategies were significantly lower for the IG than the WLC group at both T2 and T3. Adaptive ER strategies were significantly higher for the IG than the WLC group at both time-points, except for adaptive ER strategy of putting into perspective. Large effect sizes were found for all effects, demonstrating that the SSL reduced participants'

use of maladaptive strategies and increased their use of adaptive strategies. No significant SSL effects on self-esteem emerged at either time-point.

7.3.3.2. Attentional Bias

Participants had accuracy levels ranging from 75% to 82% at all time-point assessments, hence no data were removed from attentional bias analyses due to low accuracy (Nozadi et al., 2016). However, outliers and inaccurate trials were removed (T1: 3%; T2: 2%; T3: 2%).

Comparing attentional bias scores against zero, no significant attentional bias to threat was found across the whole sample at baseline, $t(95) = -0.91, p = .37$. ANCOVAs revealed no significant effects of the SSL on attentional bias, or RTs and accuracy across congruent and incongruent trials at either time-point. Across the two groups, there were two types of participants at baseline: those who attended toward threat (bias score $> 0, n = 42$) and those who attended away from threat (bias score $< 0, n = 58$). ANCOVAs were run separately for the two types of threat bias and no significant effects were found at either time-point for attentional bias away from or toward threat.

7.3.3.3. Inhibitory Control

Inhibitory control, as measured by level of accuracy across incongruent trials, was significantly higher for the IG than the WLC at both T2 and T3. Additionally, accuracy across congruent trials was also significantly higher for the IG than the WLC group at both T2 and T3. RTs for congruent trials were significantly lower for the IG than the WLC group at T3 only, while no significant group differences were found in RTs for incongruent trials at either time-point. Medium to large effect sizes were found for all significant effects, indicating that the SSL improved participants' inhibitory control.

7.3.4. Gender effects on Treatment Outcomes

A series of mixed 2 x 3 repeated measure ANOVAs were conducted for the intervention group data on treatment outcomes to identify whether gender acted as moderator for change in pre- to follow-up test scores (see Table 26).

Emotional and behavioural difficulties and positive attributes:

There were significant interaction effects between time and gender on emotional problems, hyperactivity, prosocial behaviour, total difficulties, total externalising, total internalising, and total impact. Follow-up Bonferroni-adjusted independent samples t-tests revealed that at pre-test, there were no gender differences for emotional problems ($p = .116$), prosocial behaviour ($p = .245$), total internalising problems ($p = .395$), and total impact ($p = .174$), but females scored lower than males on these variables at both post-test ($p < .001$) and at follow-up ($p < .001$). Females reported greater total difficulties at pre-test ($p = .010$), but lower total difficulties at both post-test ($p < .001$) and at follow-up ($p < .001$). Males reported greater hyperactivity ($p < .001$) and total externalising problems at pre-test ($p < .001$), but there were no significant gender differences in hyperactivity at post-test and follow-up. There were no significant interaction effects between time and gender on conduct problems or peer problems.

Anxiety and Depression:

There were significant interaction effects between time and gender on generalised anxiety disorder, separation anxiety disorder, panic disorder, social phobia, total anxiety disorders and major depressive disorder. Follow-up Bonferroni-adjusted independent samples t-tests revealed that females reported greater generalised anxiety disorder at pre-test ($p =$

.007), but that was significantly lower than males at follow-up ($p = .004$) and not at post-test ($p = .136$). Moreover, at pre-test, females reported greater separation anxiety disorder ($p = .014$), panic disorder ($p < .001$), social phobia ($p = .025$) and total anxiety disorders ($p = .001$) but that was significantly lower than males at both post-test ($p < .001$) and at follow-up ($p < .001$). Females also reported greater major depressive disorder at pre-test ($p = .025$), but that was significantly lower than males at follow-up ($p = .007$) and not at post-test ($p = .570$). There were no significant interaction effects between time and gender on obsessive compulsive disorder.

Cognitive Emotion Regulation strategies:

There were significant interaction effects between time and gender on ER strategies of self-blame and rumination. Follow-up Bonferroni-adjusted independent samples t-tests revealed that females had greater self-blame at pre-test ($p = .024$), but there were no significant gender differences in self-blame at post-test ($p = .313$), and follow-up ($p = .221$). Moreover, females reported greater rumination at pre-test ($p < .001$), but that was significantly lower than males at post-test ($p = .026$) and not at follow-up ($p = .812$). There was no significant interaction between time and gender on ER strategies of catastrophising, other-blame, acceptance, positive refocusing, refocus on planning, positive reappraisal or putting into perspective.

Inhibition:

There was no significant interaction between time and gender on inhibition control across either congruent trials or incongruent trials.

7.3.5. Trend of clinical symptoms of emotional problems at post-test (T2) and follow-up (T3)

Based on recommended SDQ cut-off scores at and above 5 to determine severity and clinical level of emotional problems (as described in Study 2), data was analysed to examine the trend of emotional problems of children following the SSL intervention over time. At baseline, a high percentage of 74% of children in the intervention group ($n = 37$) presented clinically significant symptoms of emotional problems. The percentage of children who presented clinical symptoms of emotional problems decreased to 44% ($n = 22$) soon after the SSL intervention (T2) and this percentage remained consistent at 44% ($n = 22$) at 3-months follow-up (T3). The SSL significantly reduced emotional problems from a clinical level at baseline ($M = 6.20$, $SD = 2.78$) to a non-clinical level at both T2 ($M = 4.78$, $SD = 2.38$) and T3 ($M = 4.60$, $SD = 2.44$).

7.4. Discussion

To the best of knowledge, this is the first RCT study to assess the effectiveness of a transdiagnostic evidence-based prevention programme (SSL) among a sample of institutionalised children and adolescents within the child welfare system in the LMIC of Mauritius. The unique features of the study were that it was conducted following a feasible cultural adaptation of the intervention among this vulnerable population and that it was carried out within the natural environment of the RCI setting.

The efficacy of the SSL has been evidenced over time. The percentage of children with clinically significant symptoms of emotional problems decreased across post-intervention and remained consistent at follow-up, which suggests the presence of a positive impact of SSL in reducing emotional problems in children in both short-term and long-term. The effectiveness of the SSL in a residential care setting among children and adolescents with

emotional problems adds support to evidence of implementation of the SSL in a wide range of settings such as schools (Essau et al., 2014b, 2019; Fernández-Martínez et al., 2019), Pupil Referral Unit for adolescents who have been excluded from mainstream schools (Allan et al., 2021) and juvenile homes for adolescents with problematic behaviours (Zakaria et al., 2021). In line with the first hypothesis and in agreement with previous SSL studies, the trial treatment indicates significant improvements, with moderate to strong SSL effects, on children's internalising and externalising problems, overall difficulties and the impact of these difficulties on their everyday lives at both post-intervention and 3-month follow-up. Specifically, there were significant reductions in emotional problems, conduct problems and hyperactivity, and significant improvements in prosocial behaviour at both time-points. Consistent with previous studies, participation in SSL was associated with a significant reduction not only in emotional problems but also in behavioural problems (Essau et al., 2014b; Fernández-Martínez et al., 2020). Despite the SSL not being specifically designed for problem behaviours, the varied components within SSL (e.g. improving social skills, problem-solving skills, self-esteem) might improve non-targeted behavioural problems such as conduct problems and hyperactivity; hence learnt skills acquired during sessions might have functioned as protective factors towards not only internalising, but also externalising behaviour problems (Andrade et al., 2014; Andrade & Tannock, 2012). Positive attribute skills when implemented effectively, may influence and counter the negative impacts of disruptive behaviours such as conduct problems and improve social functioning over time (Carson, 2013; Criss et al., 2002).

However, unlike some previous studies (Essau et al., 2019; Fernández-Martínez et al., 2020), no significant SSL effects on peer problems were found. The reason for this finding is unclear although it could relate to the setting in which the study has been carried out. Peer problems can be difficult to evade in a residential care environment. Despite the SSL sessions

witnessing harmonious and active peer interactions, peer problems such as peer pressure, bullying, intimidation and conflicts could potentially be present in the residential homes. Children in residential care, by virtue of their early life experiences, may be avoidant or destructive in close relationships (Lou et al., 2018). Moreover, given that the RCIs often have limited space and more children than they can accommodate, this crowdedness may present children to greater risks of peer problems (Marsh, Salika, Crozier et al., 2019). Given these circumstances, children in RCIs may require more training on peer social skills to regulate their peer relations (Arda & Ocak, 2012; Fishbein et al., 2016). Importantly, caregivers and social workers in the RCIs may have a significant role by providing ongoing daily supervision and positive influence in helping children engage with and build reparative relationships with other children in the residential homes.

Results also indicate large significant reductions in depressive symptoms and overall anxiety, as well as symptoms of specific anxiety disorders (i.e., symptoms of generalised anxiety, separation anxiety, panic, social phobia and obsessive-compulsive disorders), both immediately after treatment and 3 months later. The findings are consistent with recent SSL research (Essau et al., 2019; Fernández-Martínez et al., 2019; Orgilés et al., 2019) and other CBT-based transdiagnostic programmes (Barlow et al., 2004; Chu et al., 2016; Ehrenreich et al., 2009) targeting anxiety and depression among young people in school or community settings. The positive impact of SSL among children in RCIs is worth discussing. By being in the RCI, these children have experienced separation from their family because of various kinds of harmful family environment which could put them at a greater risk for developing mental health problems compared to children in the general population (Cameron et al., 2009). Some studies have indeed shown higher prevalence of emotional and behavioural problems among children in RCIs than those in the community setting (Vorria et al., 1998).

However, other studies have failed to find any significant differences in the

prevalence of emotional and behavioural problems among children in these two types of settings (Fernández-Molina et al., 2011). What is consistent across settings seems to be factors that are associated with emotional and behavioural problems, including low social skills and use of maladaptive regulation strategies (Knorth et al., 2008). It is therefore not surprising that by targeting these core risk factors of mental health problems, SSL is effective in reducing emotional and behavioural problems, independent of settings from which the children were recruited. Hence it is noteworthy that the positive impact of SSL among the vulnerable population of institutionalised children adds support for the use of transdiagnostic interventions within residential contexts. Given the positive findings, future studies are needed to replicate the implementation of SSL in RCIs in high-income countries. A meta-analysis of transdiagnostic interventions in RCIs indicated large treatment effects when interventions focus on social-cognitive and social-emotional skills training in these settings (Knorth et al., 2008).

The reduction in anxiety and depressive symptoms may be attributed to the integrated SSL components of cognitive and behavioural techniques that serve to target emotion dysregulation. For example, relaxation training has been used to help reduce children's physiological response to anxiety (Larson et al., 2010; Norton, 2012). Thus, relaxation may have served as an adaptive ER strategy in the current study by reducing anxiety symptoms such as panic. The efficacy of SSL validates the strong components of behavioural activation, social skills training, cognitive preparation and exposure in being efficacious for treating anxiety and depressive symptoms.

In line with the second hypothesis, the SSL intervention caused significant increases in the use of adaptive ER strategies of acceptance, positive refocusing, refocus on planning and positive reappraisal, and significant reductions in the use of maladaptive ER strategies of self-blame, rumination, catastrophising and other-blame, at both post-intervention and

follow-up. An important aim of SSL is to improve resilience in young people, and such adaptive cognitive ER strategies are considered to be important markers of resilience (Mak et al., 2011). Research suggests that working mechanisms of behavioural activation and cognitive reappraisal are effective in reducing internalising symptoms (Dimidjian et al., 2006; Forman et al., 2007) by enhancing adaptive ER strategies in building resilience (Hoge et al., 2007; Southwick et al., 2004). Moreover, adaptive ER strategies matter most in particular circumstances (Aldao and Nolen-Hoeksema, 2012), notably childhood adversity of maltreatment and in the child welfare system (Kim-Spoon et al., 2013; Robinson et al., 2009).

Being the most significant predictors of psychological maladjustment in the young population (Garnefski et al., 2009), rumination and catastrophising were used as cognitive coping strategies less following the SSL intervention, making children and adolescents less vulnerable to emotional problems (Kraaij et al., 2003). By targeting emotional understanding and positive and negative emotionality, it is arguable that skills-based cognitive and behavioural ER has largely promoted children's active form of acceptance and thoughts about future steps and handling of negative life events.

Participants reported better inhibitory control both immediately and 3 months after the SSL intervention. This suggests that following the SSL, participants were able to resist interference from non-relevant distractors through the use of more effortful cognitive processing and executive control (Posner & DiGirolamo, 1998; Ridderinkhof & van der Stelt, 2000). The implementation of exposure techniques that optimise inhibitory learning and cognitive restructuring during treatment may compensate for identified deficits and maximise inhibitory control processes (McGuire & Storch, 2019; Waters et al., 2015), despite early adversity of child maltreatment.

In line with the third hypothesis, the SSL programme had a different impact depending on children's gender. The SSL yielded better results for females compared to

males over time, specifically in relation to primary treatment outcomes of emotional problems, hyperactivity, prosocial behaviour, anxiety disorders and depression. The effect of gender in favour of girls across internalizing problems was consistent with some previous studies (Essau et al., 2019; Zakaria et al., 2021), however the effect of gender in favour of girls across externalising problems was inconsistent with previous findings (Essau et al., 2019; Allan et al., 2021). The reason for these mixed findings was unclear although it could be attributed to the fact that in the present study there were more girls than boys and that participants' responsiveness to the programme could be influential (Köster et al., 2015).

In the present study, there was no evidence of improvements in behavioural indicators of anxiety through video-feedback, contradicting previous research findings (Essau et al., 2014; Melero et al., 202; Orgiles et al., 2020). Contamination effects may have occurred in the study, whereby the waitlist-control group could have been contaminated by the experimental group. Noteworthy, children in RCIs had little access to technology and being exposed to the video-speech tasks created excitement, hence children allocated to the control condition may have received some facets of the video tasks since they were in proximity of the experimental group. To reliably overcome such bias in future research, particular time and attention needs to be paid to introducing children to the use of technology in intervention, that is, preparing children to the setting up of the video recording, to viewing the video and subsequently watching and discussing the footage (Warnock-Parkes, Wild, Stott et al., 2017). Moreover, the video speech tasks, being part of the SSL group intervention programme, were conducted in front of peers. Future research can consider an individual modality of the video speech tasks, whereby children do the speech tasks on a one-to-one basis. Indeed, new research supports the individual modality of the SSL speech tasks in clinical settings. Positive effects of the individual SSL video-feedback with cognitive preparation has been reported on children's social performance, enhancing their social skills and reducing anxiety behaviours

in social settings (Melero et al., 2021a). This may be due to certain advantages that individual video-feedback may offer to children, for instance, each child may receive unique attention tailored to his/her needs and there may be more opportunity for in-session exposure and enhanced tailored feedback from the clinician (Melero et al., 2021b).

Moreover, there was no evidence of attentional bias at baseline in the sample, and no evidence of attentional bias change following SSL intervention. The absence of an attentional bias at baseline could be due to a number of methodological factors. Recent meta-analyses suggest that the use of pictorial over linguistic stimuli and the presentation of threat stimuli (e.g. angry faces) for longer durations (1000ms rather than 500ms) seems to moderate the link between attentional bias and anxiety (Cristea et al., 2015; Dudeney et al., 2015). The attention patterns emerging at 1000ms angry-stimulus presentation in the emotion dot-probe task may reflect top-down control processes rather than vigilance to threat (Romens & Pollak, 2012). It may be that children were vigilant to anger cues, but they did not dwell on these cues and this pattern is therefore not captured in the reaction time methodology of the emotion dot-probe task used. Moreover, difficulty in differentiating between angry and neutral faces in the task might have influenced the pattern of findings in the present sample. Impaired discrimination between threatening and neutral emotional signals, where neutral facial expressions are also interpreted as negative, have been observed in individuals with experiences of trauma (Fani et al., 2011; Felmingham et al., 2003).

Some outcomes (e.g. anxiety symptoms) showed stronger SSL effects at post-intervention than at follow-up (i.e. effect sizes were smaller after three months), indicating that the SSL may be more effective in RCIs in the short-term. Despite the long-term benefits of the SSL found among children in regular school settings (Essau et al., 2019; Fernández-Martínez et al., 2019; Orgilés et al., 2019), our findings are consistent with meta-analysis

findings, which indicate that CBT-based interventions in RCIs show promising short-term outcomes but less favourable long-term outcomes (Knorth et al., 2008). This effect might relate to the complexity and severity of social and interpersonal difficulties that are typically observed among maltreated children in care (Tarren-Sweeney, 2017). Even in optimal conditions (i.e. care, therapy, etc.), the longer-term developmental course of trauma- and attachment-related difficulties may make recovery for many children and adolescents slow (Sonuga-Barke et al., 2017). To ensure intervention effects over time, repeated applications of the intervention should be carried out (Stockings et al., 2016); adding booster sessions to CBT interventions counters their declining long-term efficacy and helps maintain treatment gains more effectively in individuals with anxiety and depression (Gearing et al., 2013).

7.5. Limitations

The present study has some limitations that need to be considered when interpreting its findings. First, the sample size was small; further RCTs with larger samples of young people in RCIs are needed. Second, the study relied on referral reports from RCIs and did not use any structured diagnostic interviews. Still, participants' levels of emotional distress were assessed by the emotional problems subscale of SDQ because it discriminates well between children with and without psychopathological symptoms (Muris et al., 2003; Stallard et al., 2007). Third, the effects of SSL were assessed immediately and 3-months after treatment. Further RCTs in RCIs should examine the long-term effectiveness of SSL along with treatment adherence, which is important for recovery from mental health problems. Fourth, participants' readiness to use mental health care as evidenced by the relatively low attrition in this study was perhaps higher than can be expected of the general population. Fifth, the Cronbach's alpha values for some subscales of the SDQ were quite low, which replicated results of several other studies (e.g., Essau et al., 2012), including those that were conducted

in a low-income country (Essau et al., 2017). It has been suggested that the low internal consistency of some of the SDQ subscales might have been confounded by the reverse items (Riso et al., 2010). Additionally, the Cronbach's alpha values for some subscales of the CERQ-k were low, similar to findings reported in some other studies (e.g., Liu et al., 2016), which need to be considered in future research.

Sixth, the use of multiple assessments would be informative. Although it is widely acknowledged that the best method of assessing psychopathology and its correlates in children is via multiple informants, studies have found parents less satisfactory as informants of emotional problems compared to self-report (Essau & Barrett, 2001). Additionally, given the low agreement among informants, the use of children's self-report measures seemed justified given the fact that anxiousness is an internally derived experience. More crucially, in addition to the self-report measures, our study used (a) video analyses of children's two-minute speech tasks at the first and last sessions of SSL to identify changes in behavioural indicators of anxiety, and (b) two experimental tasks to measure executive function. The use of these different approaches ensured a more objective measure of our intervention outcome than when self-report questionnaires are used alone. Finally, comparing the IG to the WLC group may have created an inflated effect size of SSL, which may be associated with positive changes due to the attention that participants in the IG received from trainers (Morales et al., 2018). Examining SSL efficacy against active controls (e.g. alternative psychological interventions) may diminish Hawthorne effects, so this is an important direction for future trials.

7.6. Conclusion

Despite the limitations mentioned, this study demonstrated the effectiveness of SSL in reducing internalising and externalising symptoms and maladaptive ER strategies, as well as

improving adaptive ER strategies and inhibitory control in institutionalised young people. The findings lend support to the effectiveness of interventions using a residential approach in reducing psychological distress (Watters & O’Callaghan, 2016) and have important implications for the implementation of evidence-based mental health interventions in RCIs in LMICs, not least because SSL can be implemented effectively by professionals with a wide range of experience (Essau et al., 2019).

7.7. Summary

This study has examined the effectiveness of a CBT-based intervention programme, the SSL, in the prevention and treatment of emotional problems among young people in RCIs. This was the first randomised waitlist-controlled trial study among young people in Mauritius. The findings provide strong evidence for the efficacy of the SSL in reducing symptoms of emotional problems and comorbid factors. This is in line with international research on SSL, adding empirical support for the transportability of the SSL intervention programme to LMICs in need of evidence-based programmes for the prevention or treatment of emotional problems. The findings also provide strong evidence of executive function improvements in emotion regulation and inhibitory control following the SSL intervention. This research has major implications in bridging the youth mental health knowledge gap and contributing to mental health services and policies. The next chapter will provide a general discussion of the studies carried out in this thesis, while considering the limitations of the research and practical implications of this thesis.

Chapter 8:

General Discussion and Conclusions

8. Overview

This final chapter of this thesis binds together the findings from the empirical studies and reviews their contribution in advancing the understanding of the prevalence and prevention of emotional problems among young people in the LMIC of Mauritius. The strengths and limitations of this thesis, as well as the implications of findings, are then discussed. Finally, directions for future research are considered, before concluding this thesis.

8.1. Synthesis of Findings across Studies

The current thesis was innovative and provided a significant contribution to the literature in the area of prevalence and prevention of emotional problems among young people in the LMIC of Mauritius. The first part of the thesis (Studies One and Two) developed the representation of emotional problems, the associated risk factors such as problems in emotion regulation and estimated the prevalence of emotional problems in Mauritius. The second part of the thesis (Studies Three and Four) examined the transportability and adaptability of an evidence-based prevention programme to target the emotional problems, and associated risk factors, among children and adolescents.

At the time of the thesis commencement, the investigation of prevalence of emotional problems among young people in LMICs was limited. Hence this became the focus of Study One (Chapter 2). Study One examined the prevalence of emotional problems among children and adolescents in LMICs through a systematic review. The findings of the systematic review indicated a high prevalence of emotional problems such as anxiety and depression among

children and adolescents in LMICs. All the studies included in the review formed part of the Global South, that is, countries with low- or middle-income which were often politically and/or culturally marginalised. Mauritius, despite forming part of Global South nations, was devoid of any research on young people's mental health. Hence, this became the focus of Study Two (chapter 3). Study Two initiated an investigation into the prevalence of emotional problems among young people living in the previously unresearched LMIC of Mauritius. The findings of Study Two found evidence of a high prevalence of emotional problems among Mauritian adolescents and indicated that older adolescents were particularly at risk of experiencing heightened levels of emotional problems due to their poor lifestyles and low levels of emotion regulation. The findings also had major implications such that a preventative approach to emotional problems should be targeted at an earlier age.

However, despite a high prevalence of emotional problems among young people in Mauritius, there is lack of youth-related mental health policies and mental health preventative interventions in Mauritius due to high stigmatisation and lack of awareness on mental illness. The child protection system in Mauritius remains one of the most vulnerable institution for the need for mental health support for institutionalised children and adolescents. Young people living in institutional care are vulnerable to emotional problems due to child protection issues such as maltreatment and they have a particular need to access an emotional wellbeing and resilience programme. This led to Study Three (Chapter 5), looking at the cultural adaptation and refinement of a preventative resilience-building programme for young people in RCIs. A cultural adaptation of the programme was necessary because cultural, ethnic and/or geographical barriers and other obstacles such as stigma about emotional problems are some of the pertinent factors that make it difficult for individuals to benefit from CBT-based programmes (Quinonez-Freire, Vara, Herrero et al., 2021). Because of the heterogeneity of these factors, it was necessary to take into account the impact of these

factors in the prevention and treatment of emotional problems, with the aim of validating and disseminating an effectively well-adapted intervention (Keith et al., 2011). Hence, study Three particularly investigated the acceptability and feasibility of the evidence-based transdiagnostic SSL programme, for the prevention of emotional problems among young people living in RCIs in Mauritius. The SSL programme was found to be acceptable and feasible through a cultural adaptation of the programme content, protocols and procedures and the findings provided the preliminary ground for Study Four (Chapter 6) which investigated the effectiveness of the SSL in enhancing the emotional wellbeing of children and adolescents in RCIs, through a randomised controlled trial. This final study demonstrated the effectiveness of the SSL in reducing emotional problems and maladaptive emotion regulation and improving adaptive emotion regulation and cognitive inhibitory control in institutionalised young people of Mauritius.

8.2. Prevalence of Emotional Problems

The first part of this thesis (Studies One and Two) investigated the prevalence of emotional problems and the associated risk factors among young people. Findings from Study One highlight the major burden of emotional problems such as anxiety and depressive symptoms being experienced by children and adolescents living in LMICs. The systematic review of 43 studies across 20 LMICs revealed an overall prevalence rate of 41% for comorbid emotional problems which is much higher than that found among young people in HICs (Barican, Yung, Schwartz et al., 2021; Essau et al., 2000; Merikangas et al., 2010). While the prevalence rate of anxiety in LMICs (30%) seems comparable to that found in HICs, the prevalence rate of depressive symptoms in LMICs (58%) was found to be much higher than that reported in HICs ([18-30%]; Barican et al., 2021; Rancans et al., 2014; Deighton et al., 2019; Lawrence et al., 2015; Philips & Yu, 2021). With the aim of exploring

emotional problems among young people in the previously unresearched LMIC of Mauritius, findings of Study Two indicated the prevalence of emotional problems among young people in Mauritius to be 32%. Cut-off points based on the SDQ scale of total difficulties were also explored. An analysis of the SDQ cut-off scores indicated that 24% of the young sample tested were at risk of emotional and behavioural difficulties within the abnormal range. This study is the first prevalence study analysing the SDQ total difficulties cut-off values of the sample tested in Mauritius.

The last decade has witnessed a dramatic increase in fragility, conflict and violence in numerous LMICs and the experience of ongoing conflict and violence may accentuate symptoms of emotional problems such as anxiety and depression related to common occurrences and situations such as natural calamities, war, parental loss or separation. Studies have evidenced a developmental progression in the onset of anxiety and depression at an earlier age of onset (Abbo et al., 2013; Beesdo et al., 2009; Bor et al., 2014).

Given that LMICs are home to highest percentage of young people, the prevalence rates translate into an enormous number of affected children and adolescents with emotional difficulties. Overall, the findings of Study One and Two add support to prior and recent research examining emotional problems among young people in LMICs, indicating that increased children and adolescents in LMICs are suffering from emotional difficulties such as anxiety and depression (Caqueo-Urizar, Flores, Escobar et al., 2020; Cummings et al., 2014; Erskine, Baxter, Patton et al., 2017). However, addressing the emotional problems by providing adequate treatment to the young population remains challenging, given that LMICs have the lowest availability of mental health care for children and adolescents (Morris, Belfer, Daniels et al., 2011; Pedersen et al., 2019; Zhou, Ouyang, Nergui et al., 2020). One reason for the low access to treatment may relate to emotional problems of young people not being identified or diagnosed. Hence, there is an increasing need for more precise

information. Within this context, the need for assessment with regard to the screening of emotional symptoms might be beneficial. Using the indicative SDQ cut-off values as highlighted in Study Two might help the care system to screen for young people within the abnormal range and provide for the at-risk groups, establish bases for treatment and formulate prevention programmes.

8.3. Prevention of Emotional Problems

The second part of this thesis (Study Three and Four) investigated an evidence-based transdiagnostic intervention programme by assessing its feasibility and effectiveness within a new population and new context. With the aim of preventing emotional problems and building the emotional resilience of children and adolescents from an earlier age, the CBT-based transdiagnostic SSL intervention programme was firstly pilot-tested in a small sample of young people in RCIs and then secondly, clinically tested in a larger randomised controlled trial.

Study Three examined the cultural adaptability, feasibility and acceptability of the SSL among young people living in RCIs in Mauritius through a mixed-method design. Each research question of the feasibility study was addressed by qualitative data from semi-structured interviews with children and focus group discussion with staff and supported by quantitative data. Foremost, given that there was no specific mental health programme for young people in RCIs, it was important to investigate if the programme was culturally adaptable to the Mauritian culture and context and if recruitment approaches, data collection procedures, the programme implementation and its content were deemed acceptable and feasible and if participants were satisfied with the intervention. Recruitment was based on referral from staff working with children in RCIs after they received appropriate information on screening symptoms of emotional problems among the young people. The staff were

asked to identify children they considered to be displaying emotional problems. The referred children were then assessed against the eligibility criteria in order to become eligible to participate in the study. No issues were raised in relation to consent and the referral method, hence the recruitment method was seen as an acceptable recruitment strategy for the feasibility pilot study and any research to follow. The cultural adaptation of the programme involved addressing the conceptual meaning of the SSL concepts while making use of culturally-relevant proverbs, idioms, cultural syndromes and traditional Mauritian folklore games for better knowledge transfer. Given that Mauritius was not used to a research culture, it was also important to assess the context delivery, the feasibility of the outcome measures and data collection process, which were found to be feasible and effective. With the adequate changes being made, such as adaptations to language, culture and activities, addressing the mental illness stigmatisation and raising mental health awareness, the preventive intervention was found to be favourably accepted by authorities of the RCIs and the young residents. Hence, the feasibility study of the SSL provided uptake of evidence on its effectiveness as an intervention that had the potential to support efforts to accelerate mental health improvements in children and adolescents in LMIC of Mauritius.

All the participants were retained at both timepoints, soon after the intervention and 6 weeks after the intervention. Almost all participants attended the 8 sessions of the SSL and catch-up sessions for those who missed a session were also found to be effective. The high attendance rate in both child and staff groups, the very low attrition, and the elements of group dynamism and growing curiosity to learn more about the SSL skills were indicative of implementation fidelity and user satisfaction. Children and staff were very satisfied with the programme, by reporting both personal and professional usefulness and benefits of the programme. Treatment engagement was high regarding adherence to the intervention content techniques used. That is, both children and staff groups reported acceptability of the SSL

content and techniques applied such as the video speech tasks, which were perceived to have increased participants' knowledge and understanding of emotions, feelings and skills.

The perceived barriers in the intervention implementation were time constraints for the facilitator in completing the activities in each session and time constraints for some participants to complete the home tasks and the perceived low mental capacity of some children in the application of the skills learnt. With these research findings in mind and the aim to enhance user friendliness, greater flexibility was incorporated when revising the intervention for the RCT study (Study Four). For instance, within each session, optional and required strategies were listed to ensure that the session was tailored to the specific group of children. That is, increased time allocation of 10 to 15 minutes was added to each session, with increased possibilities to tailor the intensity of the programme to the characteristics and demands of the groups. There was also an increased focus on goal setting of each session and more adapted exercises and activities with less focus on writing incorporated for the RCT study. Given that caregiver involvement may be an important factor in supporting children's new adaptive behaviours and application of learnt skills to the home context following an intervention (Fisak, Richard & Mann, 2011; Martinsen et al., 2019), joint caregiver and child meetings were carried out to ensure user involvement of both parties in the applicability of new knowledge and transferability of skills learnt.

In the feasibility study, qualitative findings were generated in relation to the impact of the SSL intervention on children and conceptual data elements of children's perceived sense of empowerment, emotional wellbeing, cognition and trauma were generated. Impact of the SSL was evidenced through children's perceived positive changes in their emotional wellbeing, cognitions, skills and behaviours and their perceived challenges following the intervention. Moreover, children also reported a decrease in trauma-related symptoms, avoidant behaviours and emotion regulation. Qualitative data was supported by quantitative

data examining the SSL on treatment outcomes. For instance, at both post-SSL intervention and follow-up, preliminary indications of significant improvements were found in relation to emotional problems, specifically generalised anxiety, separation anxiety, panic and social phobia, and externalising symptoms of hyperactivity. Hence, the feasibility study indicated that the SSL was acceptable and feasible to the new population and context of Mauritius and it could potentially have positive effects on institutionalised children. This led to the investigation of a clinical trial to assess the effectiveness of the programme.

The randomised controlled trial (Study Four) investigated the efficacy of the adapted SSL intervention programme in treating transdiagnostic emotional problems in institutionalised young people. Participants in the study were randomly assigned to either an intervention group (IG) or a waitlist-control group (WLC) and they completed set of questionnaires and experimental tasks across three different time-points (T1, pre-intervention; T2, post-intervention; T3, three-months follow-up). The results across the two time-points, following the SSL intervention (T2 & T3) for both the IG and the WLC, showed the positive impact of the SSL on children's emotional and behavioural problems. Specifically, the trial treatment indicated significant improvements on children's anxiety symptoms, depressive symptoms and conduct and hyperactivity symptoms, with strong SSL effects immediately post intervention and after three months. These findings are in line with earlier and recent studies providing support of the SSL in treating emotional problems in children and adolescents (Allan et al., 2021; Essau et al., 2014b, 2019; Fernández-Martínez et al., 2019; Orgiles et al., 2020). The findings of the RCT study also lend support to the transdiagnostic SSL programme in being effective in reducing comorbid behavioural problems despite the SSL not specifically designed to target externalising problems (Allan et al., 2021; Essau et al., 2014b; Fernández-Martínez et al., 2020). Altogether, the findings of Study Three and Four provide evidence of the transportability of the SSL intervention programme from a HIC

to the LMIC of Mauritius and being adapted to a new population of children and to a new context outside school settings in treating emotional problems.

8.4. Risk factors

Risk factors related to the maintenance of emotional problems were assessed across the four studies in the thesis. In Studies One, Two and Four, gender effects on emotional problems were found. Interestingly, the systematic review indicated that comorbid emotional problems were more prevalent among boys than girls, however, when considering emotional problems of anxiety and depression separately, the gender effects differed. Both overall and specific anxiety symptoms were more prevalent among young females than young males. Likewise, young females also reported more depressive symptoms than young males. In Study Two, significant gender differences also emerged. Female adolescents reported greater emotional problems and impact of distress than males, while male adolescents reported more conduct problems. Female adolescents also reported higher prosocial behaviour than males. The results of Study Four added support to the findings of Study Two, suggesting that emotional problems among children, in particular females, were prevalent across different settings in Mauritius. Moreover, females benefitted significantly from SSL across time, with greater reduction in emotional problems and externalising problems as compared to boys. The findings of these studies seemed consistent with empirical research that has argued for a gender effect on emotional problems and responsiveness to treatment among young people in general (Bor et al., 2014; Campbell, Bann & Patalay, 2021; Droogenbroeck et al., 2018; Essau, Lewinsohn, Xin Lim et al., 2018; Essau et al., 2000; Steel et al., 2014).

The causes of gender differences in emotional problems among adolescents are not fully understood. However, adolescence can be particularly stressful when the norms of masculinity and femininity contradict with the norms of gender equality and attempting to

balance these during adolescence may be additionally difficulty. Research indicated that boys may have more difficulties in acknowledging their emotional difficulties and tend to mask them by acting out their difficulties (Patel et al., 2007). This tends to result in more externalising problems that become problematic for themselves and others. Stress, educational pressure, female identity, life satisfaction and physical appearance have been particularly correlated with increased emotional problems in adolescent girls than boys (Campbell et al., 2021; West & Sweeting, 2003; Wiklund, Malmgren-Olsson, Ohman et al., 2012). Gender differences related to emotional problems along with the different societal expectations towards boys and girls call for mental health programmes to be adapted to the needs of boys and girls.

In Study Two, age emerged as a significant predictor of emotional problems, that is, older adolescents (15-17 years) experienced more emotional and behavioural problems and higher impact of distress and impairments in their lives than the younger adolescents (12-14 years). Emotional problems have been found to increase with age (van Droogenbroeck et al., 2018). The age between 15 to 17 years is often considered as a peak phase of adolescence characterised by profound transitions and changes. The quest for one's own identity and the search for a way to stand on one's own feet is often accompanied by feelings of uncertainty, stress and anxiety. While most adolescents are able to successfully cope with these feelings, a considerable group of adolescents may suffer from more serious emotional problems. Indeed, 24% of adolescents in Study Two were found to be in the at-risk group, vulnerable to more serious emotional and behavioural problems within the abnormal range. These results are particularly important if one takes into account that emotional problems are often substantially higher during late adolescence. Indeed, mounting evidence suggests the early onset of symptoms related to emotional problems (Beesdo et al., 2009; Essau et al., 2018; Lemoult, Humphreys, Tracy et al., 2020). For this reason, mental health prevention

programmes should specifically target children and adolescents at an earlier age (Rapee, Oar, Johnco et al., 2019).

Unhealthy lifestyle behaviours and poor quality of sleep emerged as significant predictors of emotional problems among the sample of young people in Study Two. Specifically, poor lifestyles variables of health and exercise, nutrition and sense of purpose, along with poor sleep were significant predictors of depression. While the specific predictors of anxiety were the poor lifestyle variables of health and exercise and sense of purpose only. Healthy sleep is often characterised by an absence of sleep disturbances and getting enough sleep at appropriate times (Paruthi, Brooks, D'Ambrosio et al., 2016). However, dynamic developmental changes in adolescence make sleep particularly vulnerable for adolescents who become at risk for a range of inter-related sleep problems and comorbid emotional problems (Crowley, Wolfson, Tarokh et al., 2018; Short, Gradisar, Lack et al., 2013; Orchard, Gregory, Gradisar et al., 2020). Longitudinal research data suggest evidence of a strong direction of effect from sleep problems to depression (Lovato & Gradisar, 2014; Orchard et al., 2020).

Numerous studies have shown that healthy lifestyle choices can have a positive effect on symptoms of depression and anxiety (Xu, Courtney, Anderson et al., 2010), life satisfaction (Headey, Muffels & Wagner, 2013), and self-perceived mental health (Velten, Bieda, Scholten et al., 2018). Specifically, healthy lifestyle behaviours have consistently been found to be associated with lower odds of having depressive symptoms and overall psychological distress in children and adolescents (Kleppang, Haugland, Bakken et al., 2021; Rodriguez-Ayllon, Cadenas-Sanchez, Estevez et al., 2019; Poitras, Gray, Borghese et al., 2016). Moreover, a meta-analysis of cohort studies also reported that improved physical health and dietary health exert a positive effect on mental health (Ljungberg, Bondza, Lethin et al., 2020; Rodriguez-Ayllon et al., 2019; Schuch, Vancampfort, Firth et al., 2018).

In addition to lifestyle choices that are manifested in behaviours, cognitive and emotional processes such as emotion regulation strategies largely influence mental health problems such as anxiety and depression (Berking & Wupperman, 2012). Indeed, across Studies Two and Four, emotional regulation strategies emerged as a significant risk factor for emotional problems among children and adolescents in both school settings and residential care settings. In Study Two, the use of maladaptive ER strategies were significant predictors of both anxiety and depression. Interestingly, no associations were found between adaptive ER strategies and emotional problems. Research has indicated that people with comorbid emotional problems use maladaptive ER strategies more often than they use adaptive ER strategies (Dochnal, Vetro, Kiss et al., 2019; Klemanski, Curtis, McLaughlin et al., 2017; McEvoy, Watson, Watkins et al., 2013; Schafer, Naumann, Holmes et al., 2017). Moreover, in Study Two, the specific maladaptive ER strategies of self-blame and catastrophising emerged as predictors of young people belonging to the at-risk group of emotional problems. This finding provides support for previous research indicating a strong relationship between self-blame and depressive and anxiety symptoms in adolescents (Garnefski et al., 2002, 2005). A meta-analysis underlined the benefits of focusing on ER strategies in treatment programmes for young people with emotional difficulties, particularly aiming to decrease the use of maladaptive ER and increase the use of adaptive ER strategies (Schafer et al., 2017).

The findings of the last study (Study Four) in this thesis revealed that the SSL intervention programme significantly reduced participants' use of maladaptive strategies and increased their use of adaptive strategies. More specifically, the SSL intervention caused significant increases in the use of adaptive ER strategies of acceptance, positive refocusing, refocus on planning and positive reappraisal, and significant reductions in the use of maladaptive ER strategies of self-blame, rumination, catastrophising and other-blame, at both post-intervention and follow-up. The findings of Study Four add support to the research

findings that indicate that emotional problems such as anxiety and depression can be improved through transdiagnostic intervention treatments that have an increased focus on ER (Gratz, Weiss & Tull, 2015; Sloan et al., 2017; Schafer et al., 2017). The first meta-analysis that has summarized the effectiveness of existing psychological interventions to improve ER in youth, has evidenced that interventions can enhance ER in youth, and that these improvements correlate with improvements in psychopathology (Moltrecht, Deighton, Patalay et al., 2021).

In Study Four, better inhibitory control was also reported both immediately and 3 months after the SSL intervention. Precisely, inhibitory control is one of the executive functions that regulate people's thinking and behaviours (Diamond, 2013; Miyake & Friedman, 2012). Difficulties in inhibitory control predicted higher levels of anxiety and depression (Shanok, Meltzer, Frank et al., 2021), signifying that inhibitory impairments could be a risk factor for children and adolescents with emotional problems. CBT-based interventions targeting training in inhibitory control were found to be effective in mitigating emotional difficulties in young people (Banneyer, Bonin, Price et al., 2018; Connell, Shaw, Wilson et al., 2019; Hirshfeld-Becker, Masek, Henin et al., 2010). Altogether, it could be speculated that the skills training related to social, emotional, cognitive and behavioural aspects within the eight sessions of the SSL intervention programme, could have effectively reduced emotional problems such as anxiety and depression among the children and adolescents in RCIs while also effectively improving ER and inhibitory control of these young people.

8.5. Limitations of the Thesis and Directions for Future Research

Some of the limitations of this thesis mark its findings as suggestive and not conclusive, therefore, future research should try to overcome these limitations. Although the

specific limitations of each study have been separately discussed in each study chapter, a few more general limitations are hereby discussed along with some directions for future research to overcome the limitations.

Findings of the four studies in the thesis need to be considered within the context of its associated limitations. Firstly, despite the fact that all the self-report questionnaires used in the thesis were standardised questionnaires with good psychometric properties found across several low-income, middle-income and high-income countries, there was no previous psychometric evaluation of the questionnaires in Mauritius. Future research could consider validation work of the psychometric measures used in the thesis (such as the SDQ, CERQ, RCADS and self-esteem) with a much larger representative sample of the young Mauritian population, while taking into account their cultural adaptation.

Secondly, language bias may have occurred across the studies in this thesis (Studies 2, 3 & 4), bearing in mind that Mauritius is a multi-lingual island. As previously discussed in Chapter 5, standardised English language instruments were used in Study 2 given that teaching in all educational settings took place in the English language and adolescents easily communicate in that language. However, in Study 3 and Study 4, the established French-version of the standardised instruments were used. The SSL intervention manual and workbook were also translated into the French language through back translation procedure. The reason for using French language in Studies 3 and 4 was because the sample of these two studies were younger. Younger children in Mauritius most commonly communicate in French or Creole languages while older children and adolescents effectively communicate in English, French and Creole languages. The developmental level of the participants may have influenced the comprehension of language. Moreover, participants may have mentally switched into different languages while completing the questionnaires. That is, they may have mentally translated the questions into sentences or words with different meanings or without

adequate cultural adjustments because certain words may also carry different meanings in different cultures. Hence, the subtle cultural and pragmatic use of multi-language may be important predictors of over- or under-identification of emotional difficulties in Mauritius. One important direction for future research might include a qualitative exploration of mental health language in Mauritius in order to develop measurement instruments that adequately capture global and local concepts simultaneously.

Thirdly, another limitation concerns the representativeness of the sample used in the thesis. In Study 2, six schools from two school directorates agreed to take part in the study, however, one school directorate declined to participate due to reasons pertaining to mental health stigma. In study 4, approval for study participation was received from only six RCIs. Despite the fact the schools and the RCIs were representative of the different districts and urban/rural areas across Mauritius, they may not be representative of the whole student population or the residential institution population of Mauritius. Nevertheless, firstly, the sample of Study 2 was deemed sufficient to provide preliminary epidemiological evidence of emotional problems and associated risk factors among school-going adolescents in Mauritius. Secondly, the sample of Study 4 was deemed appropriate to conduct a randomised controlled trial to investigate the effectiveness of the SSL intervention programme in some RCIs in Mauritius.

Fourthly, a related limitation to the above is mental health stigma which lies behind the subtle refusal of certain educational authorities in Mauritius for study participation. For instance, while the school directorates agreed to participate in the prevalence study (Study 2), they categorically refused to facilitate knowledge-based development and implementation of the SSL intervention to meet the emotional needs of those young people in schools, who were found to display high emotional problems. Mental health is heavily stigmatised in Mauritian society, which remains a substantial barrier that prevents people from seeking appropriate

treatment. The impact of ongoing stigma and its consequences will be detrimental to the young Mauritian population if immediate actions are not taken. In 2016, 28.4% of Mauritians were found to have severe mental health disorders (WHO, 2016). As rightly put by Ramphul (2018), there is an urgent need to address mental illness in Mauritius, starting in schools. Research evidence indicates that there is limited mental illness awareness in Mauritius (Naga, 2007; Thakoor, Dong, Zhang et al., 2016). Along with limited mental health services in Mauritius, few people are aware of their emotional difficulties and this may contribute to heightened rates of suicide and full-blown mental disorders. Future research is crucial for working towards decreasing the national mental health burden in Mauritius.

Lastly, the SSL intervention effects were not assessed for a longer period than three months. Long-term efficacy of the SSL intervention will help determine the durability of effects in the prevention of emotional problems such as anxiety and depression. Moreover, additional sessions in terms of booster SSL sessions were proposed by RCI children and adolescents in the feasibility study, however, these could not be provided in the RCT study due to time constraints and limited human resources. Hence, future research assessing the SSL intervention could add booster SSL sessions every three months to ensure that the SSL skills learnt could be sustained over time and longitudinal data could be collected to assess the longer-term effects of the SSL.

8.6. Strengths of the Thesis

Despite the limitations discussed, the studies that make up this thesis have several strengths that should be acknowledged. The findings in the thesis firstly make an original contribution to knowledge on the prevalence of emotional problems among young people living in LMICs; secondly they provide an original epidemiological perspective of emotional problems and its associated risk factors among adolescents in Mauritius; thirdly they provide

intervention feasibility via the cultural adaptation of the emotional resilience-building SSL programme; and lastly, the findings indicated an original impactful contribution to the prevention of emotional problems among institutionalised children and adolescents in Mauritius through the implementation of SSL programme.

This is the first research, to the best of knowledge, that has investigated both the prevalence and prevention of emotional problems among young people in Mauritius. This thesis makes a unique contribution to the field by emphasising a transdiagnostic and dimensional perspective to emotional problems and investigating wider indicators of child/adolescent mental health such as executive functions and emotion regulation. The studies in this thesis draw on strengths from different research designs, adopting specific qualitative and quantitative approaches such as interviews, focus group discussions, systematic review and epidemiological and RCT analysis, which allowed for a more pragmatic perspective, all in line with the principles of strong research.

The prevention intervention programme used a multi-dimensional approach in teaching children and adolescents' skills to enhance their emotional resilience and deal with challenging situations in life. Young people were trained in emotional, social, cognitive and behavioural skills through varied techniques such as role plays, play activities and video feedback. Being exposed to relaxation techniques, social problem-solving skills and cognitive restructuring enhanced children's wellbeing across different domains. These benefits were evident in the research findings of follow-up data after a three-month period. The adapted SSL, grounded in successful CBT principles, was able to bridge theory, practice, challenges and addressed the mental health treatment gap in Mauritius. This thesis is thus both original and innovative in terms of the unique contribution of important concepts to be considered and researched further at both a national and international level. Consequently, it is hoped that it

encourages further research into the inclusion of the SSL in all RCIs as part of the child wellbeing programme, with regular booster sessions at regular intervals.

8.7. Implications of the Thesis

LMICs like Mauritius are in need of preventing youth emotional problems and building emotional resilience of young people in order to reduce the negative impact of emotional difficulties. In LMICs, most mental health interventions tend to focus on school settings, while fragile settings with vulnerable populations such as young people in RCIs are often neglected. At present, there are no specific prevention or treatment models to address emotional problems in RCIs in Mauritius. Following the findings of the feasibility and RCT studies, there has been increased opportunity of the inclusion of the SSL in all RCIs as part of the child wellbeing programme, with regular booster sessions at regular intervals for children and adolescents. Negotiations regarding same are currently underway with the higher RCI authorities.

The above implication was set pre-COVID-19, however, there is now a heightened pressing need to close the gap in youth mental health intervention with the global pandemic. COVID-19 has changed the lives of global youth, affecting the emotional wellbeing of children and adolescents across cultures (Orgiles, Espada, Delvecchio et al., 2021). New evidence has indicated that the SSL intervention may be useful in helping children cope with the COVID-19 situation and help reinforce their emotional resilience (Orgiles, Espada & Morales, 2020). Although the SSL programme was not created specifically to cope with the COVID-19 situation, it seems to be effective in providing children with skills to manage this unexpected event. RCIs in Mauritius have not been untouched by the pandemic and imposed confinement. Children in RCIs, already in a vulnerable position, are in greater need of adequate skills to cope with the COVID-19 situation. The SSL, focusing on building

emotional resilience and coping with stressful situations, had been successfully adapted in the Mauritian culture. Hence, it seems to be a very appropriate programme to help children and adolescents in Mauritius face the difficult situation caused by the COVID-19 pandemic.

8.8. Conclusions of the Thesis

The primary aim of this thesis was to investigate the prevalence and prevention of emotional problems among children and adolescents in the LMIC of Mauritius. The first part of the thesis focused on an investigation of the prevalence of emotional problems among young people living in LMICs through a systematic review analysis, and then an exploration of the prevalence of emotional problems among adolescents in Mauritius. The systematic research suggests that a large number of young people experience emotional problems such as anxiety and depression during their early years and Mauritius is not exempt from this concern. Mauritius, a previously unresearched LMIC in the field of childhood and adolescent mental health, was found to be comparable to other LMICs in having an important number of young people with emotional problems who may be facing inadequate mental health resources.

The current thesis looked to contribute to research in this field with more in-depth insight into the adaptation and feasibility of the SSL intervention, a transdiagnostic programme for the prevention of emotional problems. The feasibility examination of the SSL provided preliminary support to the usefulness of a transdiagnostic approach in reducing symptoms of emotional problems. The first randomised controlled trial in institutional care settings in Mauritius indicated that the transdiagnostic SSL intervention provided large reduction effects in self-reported symptoms of anxiety, depression and behavioural conduct and hyperactivity symptoms, and improved emotion regulation and inhibitory control. Young people in RCIs thus benefitted from the SSL transdiagnostic intervention with positive

changes to their emotional, social, cognitive and behavioural skills. Throughout the research in the thesis, it has been highlighted that emotion regulation is a crucial interactive contributor to emotional wellbeing. This thesis presents a significant substantial contribution to the existing literature on prevalence and prevention of emotional problems among young people by highlighting the transportability of the evidence-based transdiagnostic intervention of the SSL, especially in a fragile setting.

Appendices

Appendix 1:

Ethics Statement

The research for this project was submitted for ethics consideration under the reference PSYC 18/305 in the Department of Psychology and was approved under the procedures of the University of Roehampton's Ethics Committee originally on 06.08.2018 and an amendment approved on 04.04.2019.

Appendix 2:

PROSPERO study protocol registration CRD42018109406

Review stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	Yes	No
Formal screening of search results against eligibility criteria	Yes	No
Data extraction	Yes	No
Risk of bias (quality) assessment	Yes	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Karishma Ramdhonee Dowlot

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Mrs Ramdhonee Dowlot

7. * Named contact email.

Give the electronic email address of the named contact.

ramdhonk@roehampton.ac.uk

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

+23058285706

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

University of Roehampton

Organisation web address:

11. * Review team members and their organisational affiliations.

PROSPERO International prospective register of systematic reviews

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. NOTE: email and country now MUST be entered for each person, unless you are amending a published record.

Mrs Karishma Ramdhonee Dowlot. University of Roehampton
Professor Cecilia Essau. University of Roehampton
Dr Kieran Balloo. University of Surrey

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

none

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. NOTE: email and country must be completed for each person, unless you are amending a published record.

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

The objective of this systematic review will be to review the literature on emotional problems among children and adolescents living in low and middle income countries and to understand the nature and prevalence of emotional problems among children and adolescents in LMICs.

- How are emotional problems conceptualised in LMICs?
- What is the prevalence of emotional problems among children and adolescents in LMICs?
- What methods are used to assess the prevalence of emotional problems among children and adolescents in LMICs?

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

Search strategy include studies carried out from 1st January 2000 to 31st August 2018.

Bibliographical databases:

The following electronic databases is being searched:

PsycINFO

PubMed

psycARTICLES

ScienceDirect

Language: Only studies in the English language will be included in the review.

Publication status: Only peer reviewed journal articles will be included in the review.

Keyword/s: Combinations of the following key terms were used the searches: low/middle income countries, emotional problems, mental disorders, mental health problems, depression, anxiety, child, adolescent, youth, prevalence, epidemiology and nature.

The initial search of articles has been based on combination of keywords that have been screened for inclusion and exclusion criteria based on title and abstract.

Fulltext of the remaining studies is being reviewed to confirm relevance, and additional studies are being located via

references from source and review article cross checks for comprehensiveness.

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search results.

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Emotional problems, mental health problems, anxiety, depression in low and middle income countries among children and adolescents

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Inclusion: Studies involving children and adolescents aged between 5 to 18 years of age living in low and middle income countries (LMICs), assessed for emotional problems, mental health problems and/or issues related to anxiety and/or depression will be included. Countries listed as having low income and middle income will be included. Studies reporting on children aged 5-10 years, early adolescents (10-14 years), or older adolescents (14-18 years).

Exclusion: Studies examining children and adolescents from high-income countries will be excluded.

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

Inclusion: All studies assessing emotional problems or mental health problems such as anxiety and depression among children and adolescents living in low and middle income countries will be included. Assessment of emotional problems as measured by Clinical Interviews, Standardized questionnaires or identified via a search of clinical records.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

not applicable

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

Inclusion: Studies involving quantitative methodologies such as observational and intervention methods reporting epidemiological data on measures of emotional problems, anxiety and depression among children and adolescents living in low and middle income countries will be included.

Exclusion: Single case or case series, case reports, case studies or studies reporting only qualitative information will be excluded. Studies that are unable to separate children and adolescents (5-18 years) data from older participants will be excluded.

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or

exclusion criteria.

Studies from low- and middle-income settings (as defined by the World Bank) will be included.

Studies from high income settings will be excluded.

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

Inclusion: The interventions used in the studies can have multiple targeted outcomes, but they must have one outcome defined as measuring the prevalence of emotional problems (symptoms of anxiety and ~~depression~~) including diagnosis of these states to be included. ~~Qualitative~~ measures which provide cut-off scores based on either DSM or ICD symptoms criteria or a validated measure of clinical level of "anxiety" or "depressive symptoms" (i.e., not broken down into specific psychiatric diagnoses) will be included.

Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

none

Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

The initial search of articles based on combination of keywords will be screened for inclusion and exclusion criteria based on title and abstract.

Fulltext of the remaining studies will be reviewed to confirm relevance, and additional studies will be located via references from sources and review article cross checks for comprehensiveness.

A pre-determined form will be used to extract data from included studies. Extracted information will include: study setting, study population, methodology, participant demographics, sample size, measures/assessment used, prevalence statistics and mean and standard deviation for emotional problems measures.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment

tools that will be used.

All publications will be assessed for methodological quality and bias, in terms of the accuracy, objectivity and methodological rigour reported. A checklist for risk of bias in individual studies will be adapted.

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This must not be generic text but should be specific to your review and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

A narrative synthesis of the findings, summarising key descriptive features of the included studies, such as the method of assessment of emotional problems and the statistical analysis used to assess the prevalence in LMICs will be used.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

none

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness

No

Diagnostic

No

Epidemiologic

Yes

Individual patient data (IPD) meta-analysis

No

Intervention

No

Living systematic review

No

Meta-analysis

No

Methodology

No

Narrative synthesis

No

Network meta-analysis

No

Pre-clinical

No

PROSPERO
International prospective register of systematic reviews

Prevention
No

Prognostic
No

Prospective meta-analysis (PMA)
No

Review of reviews
No

Service delivery
No

Synthesis of qualitative studies
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
No

Care of the elderly
No

Child health
Yes

Complementary therapies
No

COVID-19
No

Crime and justice
No

Dental
No

Digestive system
No

Ear, nose and throat
No

Education

No

Endocrine and metabolic disorders

No

Eye disorders

No

General interest

No

Genetics

No

Health inequalities/health equity

No

Infections and infestations

No

International development

No

Mental health and behavioural conditions

No

Musculoskeletal

No

Neurological

No

Nursing

No

Obstetrics and gynaecology

No

Oral health

No

Palliative care

No

Perioperative care

No

Physiotherapy

No

Pregnancy and childbirth

No

Public health (including social determinants of health)

No

Rehabilitation

No

Respiratory disorders

No

Service delivery

No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents
No

Violence and abuse
No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.
English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

England

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published. New registrations must be ongoing so this field is not editable for initial submission.

Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission). List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.

Appendix 3:

Search Strategy in Medline (PUBMED) and PsycINFO (EBSCO)

CONCEPTS used for systematic review:

- 1: children/adolescents
- 2: emotional problems/anxiety/depression
- 3: Developing countries/Low- and Middle-Income Countries (LMICs)
- 4: study design

CONCEPT 1	OR	MeSH: adolescent, child, childhood, minors, teens, youth, young (people, person, population)
		Key words: child* or adolescen* or teen* or minor or youth*, (young adj (people or person or population*))
CONCEPT 2	OR	MeSH: Emotional problems, emotional disorders, emotional distress, emotional symptoms, emotional difficulties, anxiety, depression, mental health, mental health disorders, mental health problems, psychological problems, psychological disorders, psychological distress, psychological symptoms, psychological difficulties, depressive disorders, anxiety disorders, affective disorders, mood disorders, panic disorders, dysthymia, bipolar, agoraphobia, internalizing, internalising
		Key words: (emotion* adj problem* or disorder* or distress or symptom* or difficult* or health) or anxi* or depressi* or (mental adj health or disorder* or problem*) or (psycholog* adj problem* or disorder* or distress or symptom* or difficult*) or depress* disorder* or anxiety disorder* or affect* disorder* or mood disorder* or panic disorder* or bipolar disorder* or internalizing disorder*
CONCEPT 3	OR	MeSH: developing countries or low income countries or middle income countries or low middle income countries or africa or caribbean region or central america or latin America or south America or asia central or asia southeastern or asia western or asia eastern or asia pacific or indian ocean islands or pacific islands or melanesia or micronesia or west indies
		Key words: resource-limit* or resource-poor or low-resource* or limited-resource* or resource-constrain* or constrain*-resource* or under-resource* or poor*-resource* or resource-scarce* or scarce*-resource* or low-income or middle-income or lower-middle-income or upper-middle-income or LIC or LMIC or LALMIC; LMAUMIC or (developing or underdeveloped or under-developed or

		<p>emerging or less-developed or least-developed or less-economically developed or least-economically developed or less-affluent or least-affluent) adj (country or countries or nation or nations or region or regions or economy or economies or world* or population*);</p> <p>Afghanistan* or Albania* or Algeria* or American Samoa* or Angola* or Argentina* or Armenia* or Azerbaijan* or Bangladesh* or Belarus* or Belize* or Benin* or Bhutan* or Bolivia* or Bosnia And Herzegovina* or Botswana* or Brazil* or Bulgaria* or Burkina Faso* or Burundi* or Cabo Verde* or Cambodia* or Cameroon* or Central African Republic* or Chad* or China* or Colombia* or Comoros* or Congo* or Congo, Rep.* or Costa Rica* or Cote D'ivoire* or Cuba* or Djibouti* or Dominica* or Dominican Republic* or Ecuador* or Egypt* or El Salvador* or Equatorial Guinea* or Eritrea* or Ethiopia* or Fiji* or Gabon* or Gambia* or Georgia* or Ghana* or Grenada* or Guatemala* or Guinea* or Guinea-Bissau* or Guyana* or Haiti* or Honduras* or India* or Indonesia* or Iran* or Iraq* or Jamaica* or Jordan* or Kazakhstan* or Kenya* or Kiribati* or Korea* or Kosovo* or Kyrgyz Republic* or Lao Pdr* or Lebanon* or Lesotho* or Liberia* or Libya* or Macedonia, Fyr* or Madagascar* or Malawi* or Malaysia* or Maldives* or Mali* or Marshall Islands* or Mauritania* or Mauritius* or Mexico* or Micronesia, Fed. Sts.* or Moldova* or Mongolia* or Montenegro* or Morocco* or Mozambique* or Myanmar* or Namibia* or Nepal* or Nicaragua* or Niger* or Nigeria* or Pakistan* or Panama* or Papua New Guinea* or Paraguay* or Peru* or Philippines* or Romania* or Russian Federation* or Rwanda* or Samoa* or Sao Tome And Principe* or Senegal* or Serbia* or Sierra Leone* or Solomon Islands* or Somalia* or South Africa* or South Sudan* or Sri Lanka* or St. Lucia* or St. Vincent And The Grenadines* or Sudan* or Suriname* or Swaziland* or Syrian Arab Republic* or Tajikistan* or Tanzania* or Thailand* or Timor-Leste* or Togo* or Tonga* or Tunisia* or Turkey* or Turkmenistan* or Tuvalu* or Uganda* or Ukraine* or Uzbekistan* or Vanuatu* or Venezuela* or Vietnam* or West Bank And Gaza* or Yemen, Rep.* or Zambia* or Zimbabwe*; africa* or asia* or caribbean or central america* or latin america* or south america* or melanesia* or micronesia* or polynesia*</p>
<p>CONCEPT 4</p>	<p>OR</p>	<p>MeSH: epidemiologic studies/ or case-control studies/ or exp cohort studies/ or controlled before-after studies/ or cross-sectional studies/ exp longitudinal studies/ or prospective studies/ or retrospective studies/</p> <p>Key words: epidemiologic* adj stud*, case-base or case-control or case-comparison or case-refer?ent or case-</p>

	compeer, ((cohort or incidence or concurrent) adj (study or studies)), ((prevalence or cross sectional) adj (study or studies)), (cross sectional adj (survey*1 or analys*)), ((cross sectional or disease frequency) adj (survey or surveys)), cohort analys*, ((followup or follow-up) adj (study or studies)), ((retrospective or prospective or observational) adj (study or studies)), (longitudinal adj (study or studies or surveys or survey))
AND	CONCEPT 1 AND CONCEPT 2 AND CONCEPT 3 AND CONCEPT 4
Results limited to English language and publications as from 01/01/2000 to 30/09/2018	
Search: Keywords & Medical Subject Headings (MeSH)	

Search strategy (keywords) used in PSYCINFO (EBSCO):

#	Searches	Hits
1.	child*	347,257
2.	adolescen*	
3.	teen*	
4.	Youth	
5.	Minor	
6.	Minors	
7.	young N1 (people or person* or population*)	
8.	OR/ 1 – 7	
9.	emotion* N1 (problem* or disorder* or distress or symptom* or difficult* or health)	
10.	anxi*	
11.	depress*	
12.	mental N1 (health or disorder* or problem*)	
13.	psycholog* N1 (problem* or disorder* or distress or symptom* or difficult*)	
14.	depress* disorder*	
15.	anxiety disorder*	
16.	affect* disorder*	
17.	mood disorder*	
18.	panic disorder*	
19.	bipolar disorder*	
20.	internalizing disorder*	

21.	OR/ 9 – 20	296,115
22.	AB (“developing country” or “developing countries” or “developing nation” or “developing nations” or less* W1 “developed country” or less* W1 “developed countries” or less* W1 “developed nation” or less* W1 “developed nations” or “third world” or “under developed” or “middle income” or “low income” or “underserved country” or “underserved countries” or “underserved nation” or “underserved nations” or “under served country” or “under served countries” or “under served nation” or “under served nations” or “underserved population” or “underserved populations” or “under served population” or “under served populations” or “deprived country” or “deprived countries” or “deprived nation” or “deprived nations” or poor* W1 country or poor* W1 countries or poor* W1 nation* or poor* W1 population*)	20,020
23.	AB (resource-limit* or resource-poor or low-resource* or limited-resource* or resource-constrain* or constrain*-resource* or under-resource* or poor*-resource* or resource-scarce* or scarce*-resource* or low-income or middle-income or lower-middle-income or upper-middle-income or LIC or LMIC or LALMIC; LMAUMIC) N2 countr* or (developing or underdeveloped or underdeveloped or emerging or less-developed or least-developed or less-economically developed or least-economically developed or less-affluent or least-affluent) N2 (countr* or nation* or nations or region* or econom* or world or population*)	11,165
24.	Afghanistan* or Albania* or Algeria* or American Samoa* or Angola* or Argentina* or Armenia* or Azerbaijan* or Bangladesh* or Belarus* or Belize* or Benin* or Bhutan* or Bolivia* or Bosnia And Herzegovina* or Botswana* or Brazil* or Bulgaria* or Burkina Faso* or Burundi* or Cabo Verde* or Cambodia* or Cameroon* or Central African Republic* or Chad* or China* or Colombia* or Comoros* or Congo* or Congo, Rep.* or Costa Rica* or Cote D'ivoire* or Cuba* or Djibouti* or Dominica* or Dominican Republic* or Ecuador* or Egypt* or El Salvador* or Equatorial Guinea* or Eritrea* or Ethiopia* or Fiji* or Gabon* or Gambia* or Georgia* or Ghana* or Grenada* or Guatemala* or Guinea* or Guinea-Bissau* or Guyana* or Haiti* or Honduras* or India* or Indonesia* or Iran* or Iraq* or Jamaica* or Jordan* or Kazakhstan* or Kenya* or Kiribati* or Korea* or Kosovo* or Kyrgyz Republic* or Lao Pdr* or Lebanon* or Lesotho* or Liberia* or Libya*	

	or Macedonia, Fyr* or Madagascar* or Malawi* or Malaysia* or Maldives* or Mali* or Marshall Islands* or Mauritania* or Mauritius* or Mexico* or Micronesia, Fed. Sts.* or Moldova* or Mongolia* or Montenegro* or Morocco* or Mozambique* or Myanmar* or Namibia* or Nepal* or Nicaragua* or Niger* or Nigeria* or Pakistan* or Panama* or Papua New Guinea* or Paraguay* or Peru* or Philippines* or Romania* or Russian Federation* or Rwanda* or Samoa* or Sao Tome And Principe* or Senegal* or Serbia* or Sierra Leone* or Solomon Islands* or Somalia* or South Africa* or South Sudan* or Sri Lanka* or St. Lucia* or St. Vincent And The Grenadines* or Sudan* or Suriname* or Swaziland* or Syrian Arab Republic* or Tajikistan* or Tanzania* or Thailand* or Timor-Leste* or Togo* or Tonga* or Tunisia* or Turkey* or Turkmenistan* or Tuvalu* or Uganda* or Ukraine* or Uzbekistan* or Vanuatu* or Venezuela* or Vietnam* or West Bank And Gaza* or Yemen, Rep.* or Zambia* or Zimbabwe*	112,451	
25.	africa* or asia* or caribbean or central america* or latin america* or south america* or melanesia* or micronesia* or polynesia*	57,721	
26.	OR/ 22 – 25	297, 180	
27.	epidemiolog*	184, 221	
28.	prevalence N1 (stud* or survey* or analys*)		
29.	epidemiologic* N1 (stud* or case-base or case-control or case-comparison or case-refer?en*)		
30.	(cohort or incidence or concurrent) N1 stud*		
31.	cross-sectional N1 (stud* or survey* or analys*)		
32.	disease frequenc* N1 (survey* or stud*)		
33.	cohort analys*		
34.	(followup or follow-up) N1 stud*		
35.	(retrospective or prospective or observational) N1 stud*		
36.	longitudinal N1 (stud* or survey*)		
37.	OR/ 27 – 36		
38.	8 AND 21 AND 26 AND 37		1,435
39.	Full text		1,137
40.	Limit to age 0-17	742	
41.	Titles n abstracts screening	199	
42.	Grey literature Bemir, karacetin	8	

Search strategy used in MEDLINE (Pubmed)

MeSH terms search:

1.	child	"child"[MeSH Terms] OR "child"[All Fields]
2.	adolescents	"adolescent"[MeSH Terms] OR "adolescent"[All Fields] OR "adolescents"[All Fields]
3.	childhood	"Childhood"[Journal] OR "childhood"[All Fields]
4.	teenage	"adolescent"[MeSH Terms] OR "adolescent"[All Fields] OR "teenage"[All Fields]
5.	youth	"adolescent"[MeSH Terms] OR "adolescent"[All Fields] OR "youth"[All Fields]
6.	minors	"minors"[MeSH Terms] OR "minors"[All Fields]
7.	people	"persons"[MeSH Terms] OR "persons"[All Fields] OR "people"[All Fields]
8.	population	"population"[MeSH Terms] OR "population"[All Fields] OR "population groups"[MeSH Terms] OR ("population"[All Fields] AND "groups"[All Fields]) OR "population groups"[All Fields]
9.	persons	"persons"[MeSH Terms] OR "persons"[All Fields]
10.	Humans[Mesh]	"humans"[MeSH Terms]

11.	emotional	"emotions"[MeSH Terms] OR "emotions"[All Fields] OR "emotional"[All Fields]
12.	anxiety	"anxiety"[MeSH Terms] OR "anxiety"[All Fields]
13.	depression	"depressive disorder"[MeSH Terms] OR ("depressive"[All Fields] AND "disorder"[All Fields]) OR "depressive disorder"[All Fields] OR "depression"[All Fields] OR "depression"[MeSH Terms]
14.	mental health	"mental health"[MeSH Terms] OR ("mental"[All Fields] AND "health"[All Fields]) OR "mental health"[All Fields]
15.	mental health disorder	"mental disorders"[MeSH Terms] OR ("mental"[All Fields] AND "disorders"[All Fields]) OR "mental disorders"[All Fields] OR ("mental"[All Fields] AND "health"[All Fields] AND "disorder"[All Fields]) OR "mental health disorder"[All Fields]
16.	psychological disorder	"mental disorders"[MeSH Terms] OR ("mental"[All Fields] AND "disorders"[All Fields]) OR "mental disorders"[All Fields] OR ("psychological"[All Fields] AND "disorder"[All Fields]) OR "psychological disorder"[All Fields]
17.	depressive disorder	"depressive disorder"[MeSH Terms] OR ("depressive"[All Fields] AND "disorder"[All Fields]) OR "depressive disorder"[All Fields]
18.	anxiety disorder	"anxiety disorders"[MeSH Terms] OR ("anxiety"[All Fields] AND "disorders"[All Fields]) OR "anxiety disorders"[All Fields] OR ("anxiety"[All Fields] AND "disorder"[All Fields]) OR "anxiety disorder"[All Fields]
19.	affective disorder	"mood disorders"[MeSH Terms] OR ("mood"[All Fields] AND "disorders"[All Fields]) OR "mood disorders"[All Fields] OR ("affective"[All Fields] AND "disorder"[All Fields]) OR "affective disorder"[All Fields]

20.	mood disorder	"mood disorders"[MeSH Terms] OR ("mood"[All Fields] AND "disorders"[All Fields]) OR "mood disorders"[All Fields] OR ("mood"[All Fields] AND "disorder"[All Fields]) OR "mood disorder"[All Fields]
21.	panic disorder	"panic disorder"[MeSH Terms] OR ("panic"[All Fields] AND "disorder"[All Fields]) OR "panic disorder"[All Fields]
22.	bipolar disorder	"bipolar disorder"[MeSH Terms] OR ("bipolar"[All Fields] AND "disorder"[All Fields]) OR "bipolar disorder"[All Fields]
23.	disorder	"disease"[MeSH Terms] OR "disease"[All Fields] OR "disorder"[All Fields]
24.	developing countries[MeSH Terms]	"developing countries"[MeSH Terms]
25.	epidemiological studies	"epidemiologic studies"[MeSH Terms] OR ("epidemiologic"[All Fields] AND "studies"[All Fields]) OR "epidemiologic studies"[All Fields]
26.	prevalence studies	"cross-sectional studies"[MeSH Terms] OR ("cross-sectional"[All Fields] AND "studies"[All Fields]) OR "cross-sectional studies"[All Fields] OR ("prevalence"[All Fields] AND "studies"[All Fields]) OR "prevalence studies"[All Fields]
27.	case-control studies	"case-control studies"[MeSH Terms] OR ("case-control"[All Fields] AND "studies"[All Fields]) OR "case-control studies"[All Fields] OR ("case"[All Fields] AND "control"[All Fields] AND "studies"[All Fields]) OR "case control studies"[All Fields]
28.	cohort studies	"cohort studies"[MeSH Terms] OR ("cohort"[All Fields] AND "studies"[All Fields]) OR "cohort studies"[All Fields]

29.	controlled before-after studies	"controlled before-after studies"[MeSH Terms] OR ("controlled"[All Fields] AND "before-after"[All Fields] AND "studies"[All Fields]) OR "controlled before-after studies"[All Fields] OR ("controlled"[All Fields] AND "after"[All Fields] AND "studies"[All Fields]) OR "controlled before after studies"[All Fields]
30.	cross-sectional studies	"cross-sectional studies"[MeSH Terms] OR ("cross-sectional"[All Fields] AND "studies"[All Fields]) OR "cross-sectional studies"[All Fields] OR ("cross"[All Fields] AND "sectional"[All Fields] AND "studies"[All Fields]) OR "cross sectional studies"[All Fields]
31.	longitudinal studies	"longitudinal studies"[MeSH Terms] OR ("longitudinal"[All Fields] AND "studies"[All Fields]) OR "longitudinal studies"[All Fields]
32.	prospective studies	"prospective studies"[MeSH Terms] OR ("prospective"[All Fields] AND "studies"[All Fields]) OR "prospective studies"[All Fields]
33.	retrospective studies	"retrospective studies"[MeSH Terms] OR ("retrospective"[All Fields] AND "studies"[All Fields]) OR "retrospective studies"[All Fields]
34.		MeSH results: 425
35.		32

Appendix 4: School Letter of Consent (Study 2)



Department of Psychology
University of Roehampton
Whitelands College
Holybourne Avenue
London SW15 4JD

www.roehampton.ac.uk

Dear headteacher,

My name is Karishma Ramdhonee-Dowlot, a Mauritian PhD researcher at the University of Roehampton London UK. I am currently working on a project which seeks to explore a range of factors looking at children's thoughts about the way they regulate their emotions and behaviour. In particular, we want to look at emotion processing, attention processing and coping strategies.

The children will complete a set of questionnaires on computers, which will take approximately 20-25 minutes in total. These questionnaires will be used to assess: a) what children tend to think of their daily activities, b) what children tend to think of themselves in different situations, and c) the different emotion strategies that they use.

Children will be required to provide their verbal consent. Parent(s) or caregiver(s) who do not wish their child to take part in the research will be advised to return a slip at the bottom of the information sheet which indicates their wish to 'opt out' of the proposed research. Parents who return the slip will be assumed to be declining consent for the proposed research, whilst those who do not return the slip (or who decline participation through other means, e.g. e-mail to researcher, letter to school, telephone call, etc.) will be assumed to be consenting to their child's participation. Parents/ children will be able to withdraw from the study at any time if they wish to do so.

I will administer the questionnaires to the pupils and will be present throughout the completion of the questionnaires to provide assistance if needed and to ensure confidential and independent responding. The data connected to the participation of the children will be held and administered in the strictest confidence as required by the Data Protection Act (1998). The data will be kept within the research team and anonymity will be protected at all times. A unique identification number will be used, which will however be treated with strictest confidentiality by the research team.

We would appreciate you supporting us to conduct this research at your school. Please could you confirm this by signing the provided consent slip below.

In the meantime I am happy to answer any questions you might have about any aspect of the study. You can email me on ramdhonk@roehampton.ac.uk or call me on (230) 58285706.

I will be based in Mauritius throughout my project here in Mauritius and can be easily [contactable](#).

I do hope that you will consider taking part.

Yours [Faithfully](#),

Karishma Ramdhonee-Dowlot

Mauritius Address

Royal Road Belvedere
Lallmatie
Mauritius
ramdhonk@roehampton.ac.uk
(230) 58285706

UK Address

Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
ramdhonk@roehampton.ac.uk

Please complete and return this form. Thank you!

Title of Research Project: Emotional well-being and coping strategies

Consent Statement:

I agree for the students to take part in this research, and I am aware that the school and students are free to withdraw at any point without giving a reason, although if I do so I understand that our data might still be used in a collated form. I understand that the information I provide will be treated in confidence by the investigator and that my identity will be protected in the publication of any findings, and that data will be collected and processed in accordance with the Data Protection Act 1998 and with the University's Data Protection Policy.

- 1) I agree with the opt-out consent procedure.
- 2) I have seen the materials and am happy with them.
- 3) I am aware that students will take part during school hours.
- 4) I understand that students/parents have the right to withdraw from the study at any time.
- 5) I am happy for teachers to select students they feel would benefit from the programme.

School's Name

Head Teacher's Signature

Date

Please note: if you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However, if you would like to contact an independent party, please contact the Head of Department or the Director of Studies.

Director of Studies

Prof. Cecilia Essau
Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
c.essau@roehampton.ac.uk
Tel: 020 8392 3647

Head of Department

Dr Diane Bray
Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
d.bray@roehampton.ac.uk
Tel: 020 8392 3627

Appendix 5: School Approval [a] (Study 2)



Mahatma Gandhi Institute



**Ministry of Education and Human
Resources, Tertiary Education and
Scientific Research**

Dear Mrs Ramdhonee-Dowlot

Further to your mail dated 23 November 2018, we are pleased to inform you that permission has been granted to you to conduct your survey in our MGI Schools.

You will be required to submit a report to the office of the Director (Schooling) after your survey.

Thank you.

Best Regards

Dr (Mrs.) S. Ramful

Ag. Director-Schooling (MGI & RTI)

**Tel: 403 2000 ext: 2031/2029
403 2004**

Email: mgi.schooling@gmail.com

Appendix 6: School Approval [b] (Study 2)



**Ministry of Education and Human Resources,
Tertiary Education and Scientific Research**

Dear Ms Karishma Ramdhonee Dowlot,

I am pleased to inform you that permission is hereby granted to conduct research from two of our primary and secondary Catholic schools under the authority of the SeDEC listed below:

Primary schools:

St Benoit RCA (Tel: 4836479 Email: Stbenoit.rca@sedec.mu)

Notre Dame de Lourdes RCA (Tel : 4546228 Email:
nddelourdes.rca@sedec.mu)

Secondary Schools:

Collège Père Laval (Tel: 216 7693 Email: collegeperelaval@yahoo.com)

BPS B.Bassin (Tel: 4542742 Email: bpsscretariat@live.com)

As far as possible, please try to conduct your research tasks in ways that are least likely to disrupt the teaching and learning schedule. Kindly seek the advice and permission of the Head Master and Rectors, regarding your time frame for the survey and before you undertake any activity that can potentially impact on the school life or that requires special arrangements, e.g. for compliance with research ethics.

We wish you well for the pursuit of your research project and kindly urge you to please notify the SeDEC at the end of your data collection exercise.

Best wishes,

Clive Anseline
Communications Officer

Appendix 7: Opt-Out Letter for Parental Consent



Department of Psychology
University of Roehampton
Whitelands College
Holybourne Avenue
London SW15 4JD

www.roehampton.ac.uk

Dear parent,

My name is Karishma Ramdhonee-Dowlot, a Mauritian PhD researcher at the University of Roehampton London UK. I am currently working on a project which seeks to explore a range of factors looking at children's thoughts about the way they regulate their emotions and behaviour. In particular, we want to look at emotion processing, attention processing and coping strategies.

The children will complete a set of questionnaires on computers, which will take approximately 20-25 minutes in total. These questionnaires will be used to assess: a) what children tend to think of their daily activities, b) what children tend to think of themselves in different situations, and c) the different emotion strategies that they use.

The data acquired will be treated anonymously, which means that your child's name will not be requested; a unique identification number will be used, which will however be treated with strictest confidentiality by the research team and solely be used for the purpose of follow up. All computer data will also be kept confidential and only be used for research purposes.

Your child will be required to provide their verbal consent, if you do not wish for your child to take part in the research you will be advised to return a slip at the bottom of the information sheet which indicates your wish to 'opt out' of the proposed research. 'Opt out' means parents who return the slip will be assumed to be declining consent for the proposed research, whilst those who do not return the slip (or who decline participation through other means, e.g. e-mail to researcher, letter to school, telephone call, etc.) will be assumed to be consenting to their son/daughter's participation.

You or your child have the right to withdraw from the study at any time. There is no compulsion or academic pressure to take part in the project, and should your child or you decline to participate or subsequently withdraw, your child will not be adversely affected. Should your child wish to withdraw he/she needs to quote the ID number provided so that the researchers will be able to identify his/her data. Students will be able to leave the study at any time if they wish to do so, in particular if they feel distressed during any of the sessions they will then be given the opportunity to leave.

If you do NOT want your child to take part then please sign and return the slip below.

In the meantime, I am happy to answer any questions you might have about any aspect of the study. You can email me on ramdhonk@roehampton.ac.uk or call me on (230) 58285706. I will be based in Mauritius throughout my project here in Mauritius and can be easily joinable.

I do hope that you will consider taking part.

Yours Faithfully,
Karishma Ramdhonee-Dowlot

Mauritius Address
Royal Road Belvedere
Lallmatie
Mauritius
ramdhonk@roehampton.ac.uk
(230) 58285706

UK Address
Department of Psychology
Whitelands College
Holybourne Avenue
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London SW15 4JD

ramdhonk@roehampton.ac.uk
020 8392 3684

Director of Studies

Prof. Cecilia Essau
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Whitelands College
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Tel: 020 8392 3647

Head of Department

Dr Diane Bray
Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
d.bray@roehampton.ac.uk
Tel: 020 8392 3627

If you do NOT want your child to take part then please sign and return the slip below.

I do not wish for my child to participate in the study as described:

Child's name

Relationship to the child (i.e., parent, guardian or other)

Name

Signature

Date

Please note: if you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However, if you would like to contact an independent party, please contact the Head of Department or the Director of Studies.

Appendix 8: Participant Debriefing Form

Department of Psychology
University of Roehampton
Whitelands College
Holybourne Avenue
London SW15 4JD

www.roehampton.ac.uk



Participant Number: _____

PARTICIPANT DEBRIEF FORM

Title of Research Project: Emotional well-being and coping strategies

Thank you very much for taking part in our study, we greatly appreciate your contribution.

The main purpose of this study is to find out about children's thoughts, about the way they regulate their emotions and behaviour and the varied coping techniques they use in different situations.

All data gathered during this study will be held securely and anonymously. If you wish to withdraw from the study, contact us with your participant number (above) and your information will be deleted from our files. Please be aware, however, that data in summary form may already have been used for publication at the time of request.

If you are troubled or worried about any aspect of the study, or issues it may have raised, you may find it helpful to contact one of the following agencies:

Child Protection Unit - <http://gender.govmu.org/> or telephone (230) 206 3700

Ombudsperson for Children – <http://oco.govmu.org/> or telephone (230) 454-3010, 454-3020

Should you have a concern about any aspect of your participation in this study, please raise this with me, the investigator. I will be based in Mauritius throughout my project here in Mauritius and can be easily [contactable](#).

Karishma Ramdhonee-Dowlot

Mauritius Address

Royal Road Belvedere

Lallmatie

Mauritius

ramdhonk@roehampton.ac.uk

(230) 58285706

UK Address

Department of Psychology

Whitelands College

Holybourne Avenue

University of Roehampton

London SW15 4JD

ramdhonk@roehampton.ac.uk

020 8392 3684

However, if you would like to contact an independent party, please contact the Head of Psychology, or director of studies.

Director of Studies

Prof. Cecilia Essau
Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
c.essau@roehampton.ac.uk
Tel: 020 8392 3647

Head of Department

Dr Diane Bray
Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
d.bray@roehampton.ac.uk
Tel: 020 8392 3627

Appendix 9: Strength and Difficulties Questionnaire (SDQ)

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of how things have been for you **over the last six months**.

	Not True	Somewhat True	Certainly True
I try to be nice to other people. I care about their feelings			
I am restless, I cannot stay still for long			
I get a lot of headaches, stomach-aches or sickness			
I usually share with others (food, games, pens etc.)			
I get very angry and often lose my temper			
I am usually on my own. I generally play alone or keep to myself			
I usually do as I am told			
I worry a lot			
I am helpful if someone is hurt, upset or feeling ill			
I am constantly fidgeting or squirming			
I have one good friend or more			
I fight a lot. I can make other people do what I want			
I am often unhappy, down-hearted or tearful			
Other people my age generally like me			
I am easily distracted, I find it difficult to concentrate			
I am nervous in new situations. I easily lose confidence			
I am kind to younger children			
I am often accused of lying or cheating			
Other children or young people pick on me or bully me			
I often volunteer to help others (parents, teachers, children)			
I think before I do things			
I take things that are not mine from home, school or elsewhere			
I get on better with adults than with people my own age			
I have many fears, I am easily scared			
I finish the work I'm doing. My attention is good			

	No	Yes- minor difficulties	Yes- definite difficulties	Yes- severe difficulties
Overall, do you think that you have difficulties in one or more of the following areas: Emotions, concentration, behaviour or being able to get on with other people?				

If you answered 'YES', please answer the following questions about these difficulties:

How long have these difficulties been present?

- Less than a month
 1-5 months
 6-12 months
 Over a year

Do the difficulties upset or distress you?

- Not at all
 Only a little

Quite a lot

A great deal

Do the difficulties interfere with your everyday life in the following areas?

- Home Life Not at all Only a little Quite a lot A great deal

- Friendships Not at all Only a little Quite a lot A great deal

- Classroom Learning Not at all Only a little Quite a lot A great deal

- Leisure Activities Not at all Only a little Quite a lot A great deal

Do the difficulties make it harder for those around you (family, friends, teachers etc.)?

Not at all

Only a little

Quite a lot

A great deal

Appendix 10:
Revised Children’s Anxiety and Depression Scale- short version
(RCADS-25)

Please put a circle around the word that shows how often these things happen to you.
There are no right or wrong answers.

1. I feel sad or empty	Never	Sometimes	Often	Always
2. I worry when I think I have done poorly at something	Never	Sometimes	Often	Always
3. I would feel afraid of being on my own at home	Never	Sometimes	Often	Always
4. Nothing is much fun anymore	Never	Sometimes	Often	Always
5. I worry that something awful will happen to someone in my family	Never	Sometimes	Often	Always
6. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)	Never	Sometimes	Often	Always
7. I worry what other people think of me	Never	Sometimes	Often	Always
8. I have trouble sleeping	Never	Sometimes	Often	Always
9. I feel scared if I have to sleep on my own	Never	Sometimes	Often	Always
10. I have problems with my appetite	Never	Sometimes	Often	Always
11. I suddenly become dizzy or faint when there is no reason for this	Never	Sometimes	Often	Always
12. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)	Never	Sometimes	Often	Always
13. I have no energy for things	Never	Sometimes	Often	Always
14. I suddenly start to tremble or shake when there is no reason for this	Never	Sometimes	Often	Always
15. I cannot think clearly	Never	Sometimes	Often	Always
16. I feel worthless	Never	Sometimes	Often	Always
17. I have to think of special thoughts (like numbers or words) to stop bad things from happening	Never	Sometimes	Often	Always
18. I think about death	Never	Sometimes	Often	Always
19. I feel like I don’t want to move	Never	Sometimes	Often	Always
20. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of	Never	Sometimes	Often	Always
21. I am tired a lot	Never	Sometimes	Often	Always

22. I feel afraid that I will make a fool of myself in front of people	Never	Sometimes	Often	Always
23. I have to do some things in just the right way to stop bad things from happening	Never	Sometimes	Often	Always
24. I feel restless	Never	Sometimes	Often	Always
25. I worry that something bad will happen to me	Never	Sometimes	Often	Always

Appendix 11: Pittsburgh Sleep Quality Index (PSQI)

INSTRUCTIONS: *The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.*

During the past month,

1. What time have you usually gone to bed? _____
2. How long (in minutes) has it taken you to fall asleep each night? _____
3. What time have you usually gotten up in the morning? _____
4. A. How many hours of actual sleep did you get at night? _____
- B. How many hours were you in bed at night? _____

5. During the past month, how often have you had trouble sleeping because you:

	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
Cannot get to sleep within 30 minutes				
Wake up in the middle of the night or early morning				
Have to get up to use the bathroom				
Cannot breathe comfortably				
Cough or snore loudly				
Feel too cold				
Feel too hot				
Have bad dreams				
Have pain				
Watch TV				
Play videogame				
On social media (e.g. Facebook, Instagram, WhatsApp)				
Other reason (s), please describe, including how often you have had trouble sleeping because of this reason (s): _____				
During the past month, how often have you taken medicine to help you sleep?				
During the past month, how often have you had trouble staying awake while in a vehicle, eating meals, or engaging in social activity?				
During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?				

During the past month, how would you rate your sleep quality overall?	Very good 0	Fairly good 1	Fairly bad 2	Very bad 3
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Appendix 12: Lifestyle and Habits Questionnaire-Brief (LHQ-B)

Broadly examine your lifestyle behaviours and attitudes for each category below. Write the number that best corresponds to your honest response in the space provided to the left of each statement.

Strongly Disagree	Disagree	Neutral	Agree Strongly	Agree
1	2	3	4	5

Health & Exercise:

- ___ I am as physically fit as most people my age.
- ___ I have good physical endurance
- ___ I spend much of my leisure time involved in physical activities like bicycling, football, swimming, or playing other competitive sports.
- ___ I participate in vigorous exercise like running, swimming, speed walking, or dance classes for at least 20 to 30 minutes a day and at least three times a week.
- ___ I try to keep my body healthy and fit.
- ___ I participate in muscle- strengthening exercise at least several times a week.

Substance Use

- ___ I avoid taking alcoholic drinks too much.
- ___ I avoid using alcohol or other drugs to cope with problems or to make me feel more socially confident.
- ___ I avoid drinking beer or wine, or if I do, I avoid drinking more than 1 or 2 glasses a day.
- ___ I avoid drinking in situations in which it would be unsafe to drink.
- ___ I avoid socializing with people who use drugs or drink a lot.
- ___ I avoid drugs.
- ___ I avoid smoking cigarettes.
- ___ I avoid all other tobacco use, including pipe smoking, cigar smoking, and smokeless tobacco.

Nutrition

- ___ I limit my intake of high cholesterol foods such as eggs, cheese and meat.
- ___ I eat food that is boiled or steamed, not fried or sautéed.
- ___ I limit the amount of salt and sugar I consume.
- ___ I eat five or more servings of fruits and vegetable daily.

Sense of Purpose

- ___ I find meaning in my life.
- ___ I believe every life has a purpose.
- ___ I have a sense of connectedness to something larger than myself, whether it is organized religion, nature, or social causes.

Appendix 13: Cognitive Emotion Regulation Questionnaire–short version (CERQ-short)

How do you cope with events?

Everyone gets confronted with negative or unpleasant events from time to time and everyone responds to them in his or her own way. By the following questions, you are asked to indicate what you generally think when you experience negative or unpleasant events.

	(almost) never	some- times	regu- larly	often	(almost) always
1. I think that I have to accept that this has happened	1	2	3	4	5
2. I often think about how I feel about what I have experienced	1	2	3	4	5
3. I think I can learn something from the situation	1	2	3	4	5
4. I feel that I am the one who is responsible for what has happened	1	2	3	4	5
5. I think that I have to accept the situation	1	2	3	4	5
6. I am preoccupied with what I think and feel about what I have experienced	1	2	3	4	5
7. I think of pleasant things that have nothing to do with it	1	2	3	4	5
8. I think that I can become a stronger person as a result of what has happened	1	2	3	4	5
9. I keep thinking about how terrible it is what I have experienced	1	2	3	4	5
10. I feel that others are responsible for what has happened	1	2	3	4	5
11. I think of something nice instead of what has happened	1	2	3	4	5
12. I think about how to change the situation	1	2	3	4	5
13. I think that it hasn't been too bad compared to other things	1	2	3	4	5
14. I think that basically the cause must lie within myself	1	2	3	4	5
15. I think about a plan of what I can do best	1	2	3	4	5
16. I tell myself that there are worse things in life	1	2	3	4	5
17. I continually think how horrible the situation has been	1	2	3	4	5
18. I feel that basically the cause lies with others	1	2	3	4	5

Appendix 14: Letter of Consent to Ministry (Study 3 & 4)



Department of Psychology
University of Roehampton
Whitelands College
Holybourne Avenue
London SW15 4JD

www.roehampton.ac.uk

Dear Ministry,

My name is Karishma Ramdhonee-Dowlot, a Mauritian PhD researcher at the University of Roehampton London UK. I am currently working on a project aimed at exploring the benefits of using “Super Skills for Life” (SSL) programme to empower children to enhance their social skills. Previous research in 14 primary schools across London indicated that the SSL is effective in increasing children’s self-confidence and social skills. The current study is aimed at exploring the same further in Mauritius.

This programme will be conducted over a period of 4 weeks in RCIs, with each group session lasting for about 45 minutes. Children will be taught specific strategies including: identifying activities to increase self-esteem, using coping skills (e.g., relaxation), and various social skills (e.g., communication skills). As part of the sessions, there will be a 2-minute speech task that will be video-recorded to ensure the most accurate observation of the child’s social/communication skills. During the 2-minute speech task they will have the opportunity to talk about any subject they wish to (e.g. their hobbies/interests). They will have the opportunity to see how they have done in this task and how they could enhance their social/communication skills throughout the programme. Therefore, the staffs will be required to select the students they feel will most benefit from this programme.

The children will complete a set of measures before and after the programme, and as part of a follow up (i.e., an additional testing session to see how the students are progressing) 6 months later. The computer-based measures will involve students having to respond to instructions provided on screen. The attention-based tasks will include a task with adult faces depicting facial expressions (happy, angry and neutral expressions) and an inhibition task with fish images with instructions. The questionnaires will measure children’s self -esteem, what children tend to think of their daily activities, themselves; and their ability to regulate emotions. The whole procedure should last approximately 40 minutes.

Children will be required to provide their verbal consent. Caregiver(s) who do not wish their child to take part in the research will be advised to return a slip at the bottom of the information sheet which indicates their wish to ‘opt out’ of the proposed research. Parents who return the slip will be assumed to be declining consent for the proposed research, whilst those who do not return the slip (or who decline participation through other means, e.g. e-mail to researcher, letter to RCI, telephone call, etc.) will be assumed to be consenting to the child’s participation. Caregivers/children will be able to withdraw from the study at any time if they wish to do so, in particular if they feel distressed during any of the sessions they will then be given the opportunity to leave.

The data connected to the participation of the children will be held and administered in the strictest confidence as required by the Data Protection Act (1998). The data will be kept within the research team and anonymity will be protected at all times. A unique identification number will be used, which will however be treated with strictest confidentiality by the research team.

We would appreciate you supporting the SSL programme by allowing us to conduct this research at your school. Please could you confirm this by signing the provided consent slip below.

In the meantime I am happy to answer any questions you might have about any aspect of the study. You can email me on ramdhonk@roehampton.ac.uk or call me on (230) 58285706. I will be based in Mauritius throughout my project here in Mauritius and can be easily contactable.

I do hope that you will consider taking part.

Yours Faithfully,

Karishma Ramdhonee-Dowlot

Mauritius Address

Royal Road Belvedere
Lallmatie
Mauritius
ramdhonk@roehampton.ac.uk
(230) 58285706

UK Address

Department of Psychology
Whitelands College
Holybourne Avenue
University of Roehampton
London SW15 4JD
ramdhonk@roehampton.ac.uk
020 8392 3684

Please complete and return this form. Thank you!

Title of study: Enhancing children's emotional well-being, social skills and cognitive control using Super Skills for Life

Consent Statement:

I agree for the children to take part in this research, and I am aware that the RCI and the children are free to withdraw at any point without giving a reason, although if I do so I understand that the data might still be used in a collated form. I understand that the information I provide will be treated in confidence by the investigator and that my identity will be protected in the publication of any findings, and that data will be collected and processed in accordance with the Data Protection Act 1998 and with the University's Data Protection Policy.

- 1) I agree with the opt-out consent procedure.
- 2) I have seen the materials and am happy with them.
- 3) I am aware that children will take part after school hours.
- 4) I understand that children/caregivers have the right to withdraw from the study at any time.
- 5) I am happy for staff to select children they feel would benefit from the programme.

Signature

Date

Please note: if you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However, if you would like to contact an independent party, please contact the Head of Department or the Director of Studies.

Director of Studies

Prof. Cecilia Essau
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London SW15 4JD
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Appendix 15: Institution Approval (Study 3 & 4)



REPUBLIC OF MAURITIUS



MINISTRY OF GENDER EQUALITY, CHILD DEVELOPMENT AND FAMILY WELFARE

MGE/PF 439

24 September 2018

Dear Madam,

Approval for Research Intervention Programme 'Super Skills for Life'

Please refer to your letter dated 22 August 2018.

2. I am directed to inform you that your request to conduct the above research intervention programme with children under the Ministry has been approved.
3. It is advised that the programme be conducted with children in the institutions (places of safety) of the ministry.
4. Please note that verbal consent from the children maybe desirable. Consent of biological parents is not required as children are under guardianship authority of the Ministry. Guardians of children at the institutions may sign guardian letter of consent for the programme.
5. You may liaise with the officers in institution care for further arrangements.
6. With reference to the consent statement in your letter, it therefore refers to:

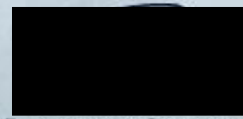
Consent Statement:

7. I agree for the children to take part in this research, and I am aware that the ministry and the children are free to withdraw at any point without giving a reason, although if I do so I understand that my data might still be used in a collated form. I understand that the information we provide will be treated in confidence by the investigator and that our identities will be protected in the publication of any findings, and that data will be collected and processed in accordance with the Data Protection Act 1998 and with the University's Data Protection Policy.

- (a) I agree with the consent procedure as at para 4 and the opt-out procedure for guardians at institutions.

- (b) I have seen the materials and am happy with them.
- (c) I am aware that children will take part after school hours or weekends.
- (d) I understand that the children have the right to withdraw from the study at any time.
- (e) I am happy for guardians to select children they feel would benefit from the programme.

Yours Faithfully



For Permanent Secretary

Mrs Karishma Sharma RAMDHONEE DOWLOT
Psychologist/Senior Psychologist

Appendix 16: Session Attendance and Checklist

Attendance Log

Please tick/cross after each session. If a participant misses a session, a catch-up session to be organized upon participant and RCI availability. Indicate if catch-up session has been provided at an alternative time.

Name	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Catch-up session/s (date and time)

Programme Fidelity Checklist

Please complete the brief checklist at the end of each session for each group. Place a tick to each of the key session elements covered during sessions. Any changes to the key aspects of the sessions should be recorded in the comments section.

Group:

Session	Topic	Description/Activities	Comments
Session 1	Introduction	<ul style="list-style-type: none"> - Introduction to Super Skills for Life, including session rules and reward system - 2-minute video presentation - Introduction to self-esteem and ways to enhance it 	
Session 2	Feelings	<ul style="list-style-type: none"> - Introduction to feelings - Feelings detective game - 2 minute presentation video-feedback. 	
Session 3	Thoughts	<ul style="list-style-type: none"> - Introduction to thoughts - Recognising helpful and unhelpful thoughts - Building goals and setting targets 	
Session 4	Linking Thoughts, Feeling and Behaviour	<ul style="list-style-type: none"> - Explaining the link between thoughts, feelings and behaviours - Recognising body signals 	
Session 5	Learning to Relax	<ul style="list-style-type: none"> - Explaining the importance of being in relaxed state - Practicing various relaxation techniques 	
Session 6	Social Skills	<ul style="list-style-type: none"> - Explaining various types of social skills 	

		<ul style="list-style-type: none"> - Role play on various social interactions such as on how to introduce oneself, joining a conversation, and on how to end conversations politely 	
Session 7	Problem Solving Steps	<ul style="list-style-type: none"> - Introduce problem solving steps - Role play of common conflict situations and applying the problem solving steps 	
Session 8	Review	<ul style="list-style-type: none"> - Overview of all the previous sessions. - 2 minute video presentation. 	

Appendix 17: Revised Children’s Anxiety and Depression Scale (RCADS-47)

Please put a circle around the word that shows how often each of these things happens to you. There are no right or wrong answers.

1. I worry about things	Never	Sometimes	Often	Always
2. I feel sad or empty	Never	Sometimes	Often	Always
3. When I have a problem, I get a funny feeling in my stomach	Never	Sometimes	Often	Always
4. I worry when I think I have done poorly at something	Never	Sometimes	Often	Always
5. I would feel afraid of being on my own at home	Never	Sometimes	Often	Always
6. Nothing is much fun anymore	Never	Sometimes	Often	Always
7. I feel scared when I have to take a test	Never	Sometimes	Often	Always
8. I feel worried when I think someone is angry with me	Never	Sometimes	Often	Always
9. I worry about being away from my parents	Never	Sometimes	Often	Always
10. I get bothered by bad or silly thoughts or pictures in my mind	Never	Sometimes	Often	Always
11. I have trouble sleeping	Never	Sometimes	Often	Always
12. I worry that I will do badly at my school work	Never	Sometimes	Often	Always
13. I worry that something awful will happen to someone in my family	Never	Sometimes	Often	Always
14. I suddenly feel as if I can't breathe when there is no reason for this	Never	Sometimes	Often	Always
15. I have problems with my appetite	Never	Sometimes	Often	Always
16. I have to keep checking that I have done things right (like the switch is off, or the door is locked)	Never	Sometimes	Often	Always
17. I feel scared if I have to sleep on my own	Never	Sometimes	Often	Always
18. I have trouble going to school in the mornings because I feel nervous or afraid	Never	Sometimes	Often	Always
19. I have no energy for things	Never	Sometimes	Often	Always
20. I worry I might look foolish	Never	Sometimes	Often	Always
21. I am tired a lot	Never	Sometimes	Often	Always
22. I worry that bad things will happen to me	Never	Sometimes	Often	Always

23. I can't seem to get bad or silly thoughts out of my head	Never	Sometimes	Often	Always
24. When I have a problem, my heart beats really fast	Never	Sometimes	Often	Always
25. I cannot think clearly	Never	Sometimes	Often	Always
26. I suddenly start to tremble or shake when there is no reason for this	Never	Sometimes	Often	Always
27. I worry that something bad will happen to me	Never	Sometimes	Often	Always
28. When I have a problem, I feel shaky	Never	Sometimes	Often	Always
29. I feel worthless	Never	Sometimes	Often	Always
30. I worry about making mistakes	Never	Sometimes	Often	Always
31. I have to think of special thoughts (like numbers or words) to stop bad things from happening	Never	Sometimes	Often	Always
32. I worry what other people think of me	Never	Sometimes	Often	Always
33. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)	Never	Sometimes	Often	Always
34. All of a sudden I feel really scared for no reason at all	Never	Sometimes	Often	Always
35. I worry about what is going to happen	Never	Sometimes	Often	Always
36. I suddenly become dizzy or faint when there is no reason for this	Never	Sometimes	Often	Always
37. I think about death	Never	Sometimes	Often	Always
38. I feel afraid if I have to talk in front of my class	Never	Sometimes	Often	Always
39. My heart suddenly starts to beat too quickly for no reason	Never	Sometimes	Often	Always
40. I feel like I don't want to move	Never	Sometimes	Often	Always
41. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of	Never	Sometimes	Often	Always
42. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)	Never	Sometimes	Often	Always
43. I feel afraid that I will make a fool of myself in front of people	Never	Sometimes	Often	Always
44. I have to do some things in just the right way to stop bad things from happening	Never	Sometimes	Often	Always
45. I worry when I go to bed at night	Never	Sometimes	Often	Always
46. I would feel scared if I had to stay away from home overnight	Never	Sometimes	Often	Always
47. I feel restless	Never	Sometimes	Often	Always

Appendix 18: Cognitive Emotion Regulation Questionnaire (Child-version; CERQ-k)

How do you cope with events?

Sometimes nice things happen in your life and sometimes unpleasant things might happen.

When something unpleasant happens, you can think about it for a long time.

When something unpleasant happens to you, what do you usually think?

	(almost never	some - times	regu- larly	often	(almost) always
1. I think that I am to blame	1	2	3	4	5
2. I think that I have to accept it	1	2	3	4	5
3. Again and again, I think of how I feel about it	1	2	3	4	5
4. I think of nicer things	1	2	3	4	5
5. I think about what would be the best for me to do	1	2	3	4	5
6. I think that I can learn from it	1	2	3	4	5
7. I think that worse things can happen	1	2	3	4	5
8. I often think that it's much worse than what happens to others	1	2	3	4	5
9. I think that others are to blame	1	2	3	4	5
10. I think that I have been stupid	1	2	3	4	5
11. It just happened; there is nothing I can do about it	1	2	3	4	5
12. I often think of what I am thinking and feeling about it	1	2	3	4	5
13. I think of nicer things that have nothing to do with it	1	2	3	4	5
14. I think of how I can cope with it	1	2	3	4	5
15. I think that it makes me feel 'older and wiser'	1	2	3	4	5
16. I think that worse things happen to others	1	2	3	4	5
17. Again and again, I think about how terrible it all is	1	2	3	4	5
18. I think that others have been stupid	1	2	3	4	5
19. I think that it's my own fault	1	2	3	4	5
20. I think that I can't change it	1	2	3	4	5
21. All the time, I think that I want to understand why I feel that way	1	2	3	4	5
22. I think of something nice and not about what happened	1	2	3	4	5
23. I think of how I can change it	1	2	3	4	5
24. I think that there are good sides to it as well	1	2	3	4	5
25. I think that it's not as bad as other things that could happen	1	2	3	4	5
26. All the time, I think that this is the worst thing that can happen to you	1	2	3	4	5
27. I think that it's the fault of others	1	2	3	4	5
28. I think that it's all caused by me	1	2	3	4	5
29. I think that I can't do anything about it	1	2	3	4	5
30. I often think of how I feel about what happened	1	2	3	4	5

31. I think of nice things that have happened to me	1	2	3	4	5
32. I think of what I can do best	1	2	3	4	5
33. I think that it's not all bad	1	2	3	4	5
34. I think that there are worse things in the world	1	2	3	4	5
35. I often think about how horrible the situation was	1	2	3	4	5
36. I think that it's all caused by others	1	2	3	4	5

Appendix 19: Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. At times I think I am no good at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I feel that I have a number of good qualities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I am able to do things as well as most other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I feel I do not have much to be proud of.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I certainly feel useless at times.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I feel that I'm a person of worth, at least on an equal plane with others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I wish I could have more respect for myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All in all, I am inclined to feel that I am a failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I take a positive attitude toward myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 20: Social Performance Rating Scale (SPRS; Behavioural signs of anxiety)

Slightly modified from: Fydrich et al., (1998)

A.1. GAZE

- (1) Very Poor: Child completely avoids looking at the group/camera or stares continually during the 2-minute speech task.
- (2) Poor: Child avoids eye contact (or stares) for majority of time. Disruptive to performance.
- (3) Fair: Child frequently avoids eye contact (or stares). Gaze pattern is mildly disruptive to performance.
- (4) Good: Child occasionally avoids eye contact or tends to look too much (stares)
- (5) Very Good: Child keeps eye contact during the 2-minute speech task, does not stare; shifts focus during pauses and conversation.

A.2. VOCAL QUALITY

- (1) Very Poor: (a) Child speaks in a flat, monotonous voice; or (b) speaks at a low volume or mumbles; or (c) speaks overly loudly, or has intrusive tone (harsh or unpleasant voice quality).
- (2) Poor: (a) Child demonstrates no warmth, enthusiasm, or interest in verbal expression; or (b) volume somewhat low and speech somewhat unclear; or (c) speaks a little bit too loudly, or tone is somewhat intrusive or sarcastic.
- (3) Fair: (a) Child shows some warmth in verbal expression but at most times sounds unenthusiastic or uninterested; and (b) speaks in appropriate volume (given partner's volume); has clear voice quality; and (c) does not have an intrusive or sarcastic tone.
- (4) Good: (a) Child shows moderate warmth and but inconsistent enthusiasm or interest. Could also be too 'gushy' (seems fake or forced); and (b) and (c) are as in Fair.
- (5) Very Good: Child is warm and enthusiastic in verbal expression without sounding condescending or gushy.

A.3. LENGTH

- (1) Very Poor: Monosyllabic ('hmmm', 'yeah', 'OK') speech turns; or responses so long that partner must interrupt or cannot utter reply.
- (2) Poor: Child makes mostly short statements with very long pauses; or speaks in long

phrases that monopolize the conversation.

- (3) Fair: Child mostly speaks one sentence at a time with occasional long pauses between sentences; or s/he tends to talk excessively (or tangentially) most of the time.
- (4) Good: Child mostly speaks in statements of one or two sentences without any major pauses, but there are other occasions where speech is short or excessive or tangential.
- (5) Very Good: At most times, child's utterances are two or more sentences long.

A.4. DISCOMFORT

- (1) Very High: Complete rigidity of arms, legs or whole body. Constant leg movements or fidgeting with hands, hair or clothing. Extremely stiff face or constant facial tics. Frequent nervous throat clearing, swallowing, or stuttering. Frequent inappropriate giggling or laughing. Look of extreme discomfort and desire to flee situation shown by 2 or more breaks in role. Child does not pay attention to the role-play tasks most of the time.
- (2) High: Rigidity or fidgeting for majority of time. Difficulty sitting still is somewhat disruptive to conversation. Stiff face or frequent facial tics. Some nervous throat clearing or swallowing. Some inappropriate giggling or laughing. Child shows signs of discomfort by frequently looking around.
- (3) Moderate: No rigidity. Slight movement of legs, fidgeting, throat clearing, or swallowing. Participant shows only brief periods of discomfort. Focuses on the 2-minute speech task most of the time.
- (4) Low: No rigidity, nervous throat clearing, or swallowing. Minimal fidgeting that is not disruptive to performance. No notable signs of discomfort. Remains focused on the 2-minute speech task. At times may appear relaxed and at ease (smiling or gesturing).
- (5) Very Low: Relaxed body posture and natural body movement. Child laughs and smiles at appropriate times. S/he shows effective gesturing (to be distinguished from fidgeting). Child focuses on the task all the time, does not appear at all uncomfortable, but at ease in situation.

A.5. CONVERSATION FLOW

- (1) Very Poor: Child makes few attempts to initiate the speech. Even when prompted by the facilitator, child cannot maintain the speech.
- (2) Poor: Child tries to talk but is only successful about half the time. The conversation does not flow smoothly.
- (3) Fair: For the most part, the child is able to maintain the speech with little help from the facilitator, although the speech is still somewhat awkward and stalls at times.
- (4) Good: Child is able to keep talking with little to no help from the facilitator. The speech flows smoothly.
- (5) Very Good: Child easily maintains the conversation and talks fluidly. Child shows genuine interest in the speech.

Summary of the coding:

	1 (very poor)	2	3	4	5 (very good)
Gaze					
Vocal quality					
Length					
Conversation flow					
	1 (very high)				5 (very low)
Discomfort					

Appendix 21: Qualitative Interview Schedule (children and staff)

Themes	Interview Questions	Prompts as follow-up questions
Effectiveness of the intervention programme - Self-reported experiences of the programme content and format	1) What comes up in your mind when you think about the 'Super Skills for Life' program?	In what ways do you think the programme will be helpful for you?
	2) What was your experience with the exercises in the workbook?	How did you find the exercises? Were you able to work through them? Did you experience any difficulties working through the exercises? Did you require any help?
	3) What was your experience with the group activities?	Which group activities did you enjoy the most?
	4) How did you feel doing the programme in a group?	
The factors contributing to, or preventing, the sustainability of techniques	5) Which sessions of Super Skills for Life did you find the most helpful for you, and why?	Do you think the session on xxx can be more helpful for you? Do you think these helpful skills will bring changes in you?
	6) Which aspect of Super Skills for Life did you find the most difficult for you, and why?	How did you go through the difficulties experienced?
Perceived changes in thoughts, feelings and behaviour	7) What changes in your emotional state have you noticed since you started the programme?	What changes have you noticed in yourself?
	8) How do you think this programme can further help children?	How do you think this programme can help children who have not received it yet? How do you think it will help older children or young children?
Suggested ways to improve the programme	9) How do you think this programme can be improved?	Any last few words you would like to say?

Themes	Interview Questions	Prompts as follow-up questions
Effectiveness of the intervention programme - Self-reported experiences of the programme content and format	What comes up in your mind when you think about the 'Super Skills for Life' program?	In what ways do you think the programme will be helpful for you?
	10) What was your experience with the exercises in the workbook?	How did you find the exercises? Were you able to work through them? Did you experience any difficulties working through the exercises?
	11) What was your experience with the group activities?	Which group activities did you enjoy the most?
	12) How did you feel doing the programme in a group?	
The factors contributing to, or preventing, the sustainability of techniques	13) Which sessions of Super Skills for Life did you find the most helpful for you, and why?	Do you think the session on xxx can be more helpful for you? Do you think these helpful skills will bring changes in you?
	14) Which aspect of Super Skills for Life did you find the most difficult for you, and why?	How did you go through the difficulties experienced?
Perceived changes in thoughts, feelings and behaviour	15) What changes in your emotional state have you noticed since you started the programme?	What changes have you noticed in yourself?
	16) How do you think this programme can further help children?	How do you think this programme can help children who have not received it yet? How do you think it will help older children or young children?
Suggested ways to improve the programme	17) How do you think this programme can be improved?	Any last few words you would like to say?

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