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Preventing anxiety and depression in adolescents: A randomised controlled trial of two school based Internet-delivered cognitive behavioural therapy programmes

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ABSTRACT

The aims of the current study were to 1) establish the efficacy of two Internet-based prevention programmes to reduce anxiety and depressive symptoms in adolescents; and 2) investigate the distribution of psychological symptoms in a large sample of Australian adolescents prior to the implementation of the intervention. A cluster randomised controlled trial was conducted with 976 Year 9–10 students from twelve Australian secondary schools in 2009. Four schools were randomly allocated to the Anxiety Internet-based prevention programme (n = 372), five schools to the Depression Internet-based prevention programme (n = 380) and three to their usual health classes (n = 224). The Thiswayup Schools for Anxiety and Depression prevention courses were presented over the Internet and consist of 6–7 evidence-based, curriculum consistent lessons to improve the ability to manage anxiety and depressive symptoms. Participants were assessed at baseline and post-intervention. Data analysis was constrained by both study attrition and data corruption. Thus post-intervention data were only available for 265/976 students. Compared to the control group, students in the depression intervention group showed a significant improvement in anxiety and depressive symptoms at the end of the course, whilst students in the anxiety intervention demonstrated a reduction in symptoms of anxiety. No significant differences were found in psychological distress. The Thiswayup Schools Depression and Anxiety interventions appear to reduce anxiety and depressive symptoms in adolescents using a curriculum based, blended online and offline cognitive behavioural therapy programme that was implemented by classroom teachers. Given the study limitations, particularly the loss of post-intervention data, these findings can only be considered preliminary and need to be replicated in future research.

1. Introduction

Prevention programmes for internalising disorders (anxiety and depression) should be the top priorities given the prevalence, disability and service use associated with these disorders that have an early age of onset (Andrews et al., 2001). Effective prevention should occur in the developmental epoch preceding and during the age of peak incidence (Gladstone et al., 2011) so that impairment in adulthood can be avoided (Calear and Christensen, 2010; Fisak Jr et al., 2011). Whilst the optimal goal of prevention is to prevent the disorder occurring, to delay the onset of a disorder or a worsening of symptoms is a cost-effective and worthwhile goal (Garber and Weersing, 2010).

A number of published meta-analyses and systematic reviews have investigated the prevention of internalising disorders within adolescent populations (Horowitz and Garber, 2006; Richardson et al., 2010; Stice et al., 2009). Most of these prevention programmes target depression rather than anxiety (Calear and Christensen, 2010). Few qualified as universal prevention programmes for adolescent anxiety or depression, administered by a teacher in a school setting using cognitive behavioural therapy (CBT). Out of those that did, four programmes were specific for the prevention of depression [Problem Solving for Life (Spence et al., 2005), Resourceful Adolescent Program (Shochet and Ham, 2004), Resourceful Adolescent Program-Kiwi (Merry et al., 2004), Penn Resiliency Program (Chaplin et al., 2006)], and only one for the prevention of anxiety [Aussie Optimism Program (Roberts et al., 2010)]. MoodGYM and FRIENDS were the only programmes that offered

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prevention in both anxiety and depression and only MoodGYM delivered their course online (Barrett et al., 2006; Calear and Christensen, 2010). Small effect sizes are typical in the field. The weighted overall mean effect size for universal school-based anxiety and depression prevention programmes was 0.18 and 0.16, respectively (Fisak et al., 2011; Horowitz and Garber, 2006).

A universal school-based Internet programme for both anxiety and depression would have many advantages. They include high implementation fidelity, scalability, low cost and the ability to monitor user adherence, progress and outcomes through automated data collection and feedback. Yet few Internet programmes have been developed for children and adolescents (Calear and Christensen, 2010). This is surprising given adolescents are familiar and competent using computers (Cuijpers et al., 2008) and are increasingly seeking informal and formal help online (Burns et al., 2010). The efficacy of the Thiswayup Schools courses (formerly CLIMATE Schools) in stress, alcohol and cannabis has been demonstrated (Van Vliet and Andrews, 2009; Newton et al., 2009; Newton et al., 2010; Vogl et al., 2009). We therefore developed and evaluated two web based courses for prevention of anxiety and depression that satisfies the mental health syllabus in high schools in Australia. The current study 1) investigates the efficacy of these courses when compared with usual health education; and 2) reports the distribution of psychological symptoms in a large sample of Australian adolescents prior to the implementation of the intervention.

2. Materials and Methods

2.1. Participants

Informed consent was obtained from parents of 976 students and twelve school principals from twelve independent high schools in Australia. Schools were recruited from major cities (75%) and inner regional areas of New South Wales, Australia with students from Years 9 to 10, aged between 14 and 16 years, 70% were female. Due to the loss of baseline data (see below) these demographic characteristics were imputed from the location and demographic composition of the school.

2.2. Design

The study was designed as a three arm cluster randomised controlled trial (RCT) and convenience sampling was used to select the schools in New South Wales, Australia. A total of 976 students from twelve schools provided informed consent and completed baseline questionnaires. Four schools ($n = 372$) were randomly allocated to the 'Overcoming Anxiety' intervention condition, five schools ($n = 380$) were randomly allocated to the 'Combating Depression' intervention condition, and three schools ($n = 224$) were randomly allocated to the teaching as usual control condition. Self-report data were obtained from students on two separate occasions: at baseline and at the end of the intervention. Students from the control schools completed the same pattern of assessments but received their usual health classes in place of the online programme. All aspects of this trial were approved by the University of New South Wales Human Ethics Committee and the trial is registered with the Australian Clinical Trials Registry (ACTRN12612000414819).

2.3. Intervention

The Thiswayup Schools: Combating Depression and Overcoming Anxiety courses were developed as universal prevention courses based on CBT principles. The depression course contains 7 lessons whilst the anxiety course contains 6 lessons. Each lesson aims to teach students to identify symptoms of depression or anxiety and teaches them how to deal with these effectively. The programmes incorporate several important cognitive-behavioural components that are based on skill acquisition; psycho-education, management of thoughts, emotions and behaviours specific to each disorder. The courses were delivered once a week over a total of six/seven weeks. The lessons ran for 40 min, students log into the course and individually undertake the 15–20 minute self-directed lesson in which students follow a cartoon based storyline of teenagers with anxiety or depression solve real life problems. In the second component of each lesson, teachers hand out class work sheets to stimulate a discussion to reinforce the information learnt from the cartoon storyline. Teachers in the intervention groups required no training, apart from the manual. Work completed by the control and intervention groups was done in regular personal development and health classes under the supervision of their regular teacher. The current online lessons can be viewed at www.thiswayup.org.au/schools.

2.4. Measures

2.4.1. Anxiety symptomatology

The Generalised Anxiety Disorder seven item scale (GAD-7) was used to measure anxiety symptoms (internal consistency $\alpha = 0.89$) (Daig et al., 2009). The scores of all seven items range from with higher scores indexing higher severity of GAD (range 0–21).

2.4.2. Depression symptomatology

A short form of the Patient Health Questionnaire-9 (Kroenke et al., 2001) was used to measure depressive symptoms (the PHQ-5). This comprised the five items that index the five psychological symptoms of major depression (depressed mood, lack of interest, worthlessness, poor concentration, and thoughts of death) (Andrews et al., 2007; Zimmerman et al., 2006), with each item ranging from 0 (not at all) to 3 (nearly every day). Higher scores on the PHQ-5 index higher severity of depression (range = 0–15).

2.4.3. Psychological distress scale

The six-item short form of the Kessler psychological distress scale [K6; correlation with K10 $r = 0.97$ (Kessler et al., 2003), internal consistency $\alpha = 0.89$ (Kessler et al., 2002)] was used to measure levels of non-specific psychological distress on a scale of 0–24. The score of each item ranged from 0 (none of the time) to 4 (all of the time) with higher scores indexing higher levels of psychological distress.

2.5. Statistical analysis

Statistical analyses were constrained by both study attrition and corrupted data. Less than half of the sample ($n = 421 / 976$; 43.1%) provided post-intervention data due to study attrition. After completion of the study, the unit moved to a different location and changed information technology provider. In this process, the data files were corrupted and demographic details (including age and sex) were unrecoverable, whilst post-intervention scores for the main outcome variables were also lost. We were able to recover the post-intervention scores for 265 students but we were unable to determine whether individual missing scores in the recovered databases were the result of study attrition or corrupted data. Outcome analyses were therefore conducted on an intention to treat basis using linear mixed-model repeated measures (MMRM) analysis of variance tests (West et al., 2006). Under the assumption that data is missing at random (MAR), mixed models estimate statistical parameters in repeated measures studies with unbalanced data using maximum likelihood estimation, making use of the incomplete data in a way that does not bias the parameter estimates (West et al., 2006). Baseline analyses were conducted on both the full ($n = 976$) and reduced ($n = 265$) samples.

2.5.1. Missing data analysis

Initial analyses focused on baseline differences between those students for whom we did and did not have post-treatment data. Chi-