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Effects of a classroom-based educational resource on adolescent mental health literacy: A cluster randomised controlled trial

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ABSTRACT

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Evidence suggests that poor mental health literacy is a key barrier to help-seeking for mental health difficulties in adolescence. Educational programs have shown positive effects on literacy, however, the evidence base remains limited and available studies have many methodological limitations. Using cluster Randomised Control Trial (RCT) methodology, the current study examines the impact of 'HeadStrong', a school-based educational intervention, on mental health literacy, stigma, help-seeking, psychological distress and suicidal ideation. A total of 380 students in 22 classes (clusters) from 10 non-government secondary schools was randomised to receive either HeadStrong or Personal Development, Health and Physical Education (PDHPE) classes. Participants were assessed pre- and post-intervention, and at 6-month follow-up. Literacy improved and stigma reduced in both groups at post-intervention and follow-up, relative to baseline. However, these effects were significantly greater in the HeadStrong condition. The study demonstrates the potential of HeadStrong to improve mental health literacy and reduce stigma.
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Introduction

Background

Mental health disorders have detrimental effects on wellbeing, functioning and development in adolescence (Kessler, Foster, Saunders, & Stang, 1995; O'Connell, Boat, & Warner, 2009). However, young people are reluctant to seek professional help for mental illness. Less than one in four 16–24 year old Australians diagnosed with a mental disorder accessed health services in the previous year (Reavley, Cvetkovski, Jorm, & Lubman, 2010). A recent review of help-seeking for mental

disorders found lack of knowledge regarding mental health to be a key obstacle preventing young people from seeking assistance (Gulliver, Griffiths, & Christensen, 2010).

Mental health literacy is defined as 'knowledge and beliefs about mental disorders which aid their recognition, management and prevention' (Jorm et al. 1997). Poor literacy is associated with lower rates of help-seeking and service use, as well as societal stigma and discriminatory behaviour (Evans-Lacko, Brohan, Mojtabai, & Thornicroft, 2012; Rusch, Evans-Lacko, Henderson, Flach, & Thornicroft, 2011; Thornicroft, 2008).

A second barrier to recognition, disclosure of distress and accessing mental health care is stigma and embarrassment. Stigma around mental illness has two aspects; public stigma refers to negative prejudicial attitudes and discrimination towards individuals with mental illness endorsed by the general population, while self-stigma describes an individuals' internalisation of these negative attitudes and beliefs (Corrigan & Rao, 2012; Evans-Lacko et al., 2012). Both public and self-stigma have a broad range of negative ramifications for those with mental illness, notably social exclusion and reduced treatment-seeking (Conner et al., 2010; Evans-Lacko et al., 2012; Patel et al., 2010).

Negative attitudes towards mental illness are commonly endorsed by adolescents (Reavley & Jorm, 2011). High levels of these stigmatising attitudes amongst adolescents are associated with reduced intentions to seek professional help and a lower likelihood of viewing such support as helpful (Yap, Reavley, & Jorm, 2013), and influence the first aid actions adolescents take towards distressed peers (Yap & Jorm, 2011). Moreover, in a recent study, a majority of Australian youth expressed a strong reluctance to disclose the presence of various mental illnesses (Reavley & Jorm, 2011), representing an important barrier to help-seeking in this population (Gulliver et al., 2010).

Education is critical to enhancing mental health knowledge, reducing stigma and improving access to care (Kelly, Jorm, & Wright, 2007). However, the evidence base for educational interventions targeting youth is limited. To date, there have been four small randomised trials conducted in American (Battaglia, Coverdale, & Bushong, 1990; Esters, Cooker, & Ittenbach, 1998; Pinto-Foltz, Logsdon, & Myers, 2011) and Pakistani (Rahman, Mubbashar, Gater, & Goldberg, 1998) secondary schools. These trials demonstrated promising findings amongst students, following an educational intervention, including enhanced mental health literacy, attitudes and willingness to seek professional help. However, findings are tempered by study limitations including small sample sizes, lack of follow-up, low response rates and potential for intergroup contamination. Accordingly, there is a clear need for additional, well-controlled research in this area (Pinto-Foltz, Logsdon, & Myers, 2011).

Objectives

The current study represents the first stage of a cluster Randomised Controlled Trial (RCT) designed to evaluate the impact of HeadStrong, a universal, curriculum-based educational program, relative to Stage 5 Personal Development, Health and Physical Education (PDHPE) classes. Given the time-intensive and costly nature of field work, this trial was planned in stages, in order to determine the effect size on the key outcome variables, guide ongoing sample size estimates, streamline implementation in non-government school systems and refine operational issues associated with implementing a large-scale trial. A cluster design was chosen as HeadStrong was delivered to classes not individuals, with randomisation occurring at the school level.

We hypothesised that individuals receiving the HeadStrong curriculum would demonstrate superior mental health literacy to those in the control condition. We also anticipated that the program would have a positive impact on personal stigma, and help-seeking.

The effect of the intervention on psychological distress and suicidal ideation was also examined in exploratory analyses. There is evidence in the adult literature that psychoeducation can be associated with a reduction in symptoms (Donker, Griffiths, Cuijpers, & Christensen, 2009). Therefore, we aimed to determine whether participation in the program, possibly via hypothesised improvements in help-seeking, would also reduce symptoms of distress and suicidal thinking.

Method

Participants

Participants were 380 secondary school students in Year 9 or 10, recruited from five Catholic (56%) and five Independent (44%) schools in Central West New South Wales, Australia. Between one and seven classes participated in each school. Participants were aged 13–16 years ($M = 14.75$ years) with equal representation across genders. Over 97% of participants spoke English at home, and approximately 5% of the sample identified as Aboriginal or Torres Strait Islander. Due to the universal nature of the intervention, there were no exclusion criteria for this study.

Procedure

School principals were contacted in writing and invited to allow their schools to participate in the study. Once the principals' informed consent was obtained, PDHPE teachers were contacted in writing to ensure that they were willing to deliver the HeadStrong program (or classes as usual) and to facilitate the administration of the assessment measures. Following this, a letter was sent to the parent(s)/guardian(s) of Year 9 and 10 students with a consent form for each child who was eligible to participate in the study. Students whose parents provided consent were given an information and consent form in their PDHPE class, at the commencement of the trial.

During each assessment phase, the teachers distributed a questionnaire booklet to each student. After the questionnaires were completed, the teacher sealed the booklets of consenting students in a secure package, and the empty booklets of non-consenting students in a separate secure package. Both packages were sent to the researchers, but only the booklets from consenting students were used in the analysis. The booklets from non-consenting students were disposed of in a secure fashion. Researchers checked the booklets from consenting students to ensure that parental consent was also obtained. Data from consenting students who did not have parental consent was excluded from the analysis.

Interventions

Interventions were delivered at the classroom level. Schools randomised to the experimental condition delivered the HeadStrong program in Term 1 of the school year. The HeadStrong resource comprises a booklet, slideshow, and various appendices, which can be freely downloaded by PDHPE teachers from the HeadStrong website. The booklet provides teachers with information on mood disorders, activities to implement in their classrooms, and guidance on how to deliver the activities. All of the HeadStrong content is explicitly linked to syllabus outcomes, which allows teachers to meet syllabus objectives pertaining to mental health and self-development. HeadStrong classroom activities are delivered over a period of 5–8 weeks, and take approximately 10 hours of class time in total. The HeadStrong resource contains five modules:

1) *Mood and mental wellbeing*: This module is an introduction to the concepts of mental health and wellbeing, values, perceptions, the dynamic nature of mental health, and stigma.
2) *The low down on mood disorders*: This module aims to enhance students' understanding of mood disorders. It consists of activities that support students to explore the nature of moods and how a fluctuating mood, if it becomes severe or persistent, can be indicative of a mood disorder.
3) *Reaching out − helping others*: The activities in this module explore the nature of the help-seeking journey and how students can support their peers if they are experiencing mental health difficulties.
4) *Helping yourself*: This module explores two key areas that people can work on to boost their mental health and protect themselves from mental health problems − building resilience and exercising their mind.
5) *Making a difference*: These activities support students to propose, develop and implement local actions to raise awareness and dispel myths relating to youth mental health issues.

The HeadStrong training program for teachers involved participation in an interactive one-day workshop conducted by study personnel. The workshop involved a detailed exploration of the curriculum resource, learning ways to support students in need and increasing awareness of mental health resources available to assist teachers. All teachers participated in the HeadStrong training program prior to the commencement of the trial, as the training provided an opportunity for principals to better understand the nature of the program prior to committing to participation in the trial.

Schools randomised to the control condition participated in their usual PDHPE classes, which consisted of content from the PDHPE curriculum. Although each school covered different topics over the intervention and follow-up period (depending on the scope and sequence for the year), all schools drew on the following content areas outlined in the Stage 5 PDHPE national curriculum: 1) Self and Relationships, 2) Movement Skill and Performance, 3) Individual and Community Health, and 4) Lifelong Physical Activity. Teachers in the control condition were asked to refrain from delivering the HeadStrong program or any content pertaining to mental health in Terms 1–3 of the school year, but were free to provide either once the follow-up assessments were completed.

Outcomes

All outcome measures pertain to the individual level. Assessments were conducted on three occasions: i) pre-intervention − beginning of Term 1, before the intervention students received the HeadStrong program, ii) post-intervention − end of Term 1, immediately after the intervention students received the program, iii) 6-month follow-up − end of Term 3, approximately 6 months after the intervention students received the program. All participating students, regardless of the condition to which they had been allocated, completed the same questionnaires at each of the three assessment occasions. The wording of some measures was adapted slightly to facilitate comprehension in the adolescent sample.

The primary outcome, mental health literacy, was assessed using a modified version of the *Depression Literacy Scale* (D-Lit; Griffiths, Christensen, Jorm, Evans, & Groves, 2004). This 24-item questionnaire was used to assess students' knowledge and understanding of the information covered by the HeadStrong program. The revised scale includes items focused specifically on depression, as well as a number of items pertaining to bipolar disorder, psychosis and mental health more broadly. The original version of the Depression Literacy Scale consists of 22 True or False items, while the adapted D-Lit used in the current study includes 16 True/False questions and 8 multiple-choice items. A number of items overlap between the two scales, including items pertaining to memory, sleep and guilt e.g., 'People with depression may feel guilty when they are not at fault'. The majority of items, however, was revised to directly assess content of the HeadStrong program. Examples of the True/False and multiple-choice items in the modified scale include 'You cannot inherit depression from your parents' and 'Roughly how many people will experience depression before the age of 18?'. Participants score one point for each correct answer.

Accordingly, higher scores indicate greater literacy. In the current sample, internal consistency for the scale was .725 at the pre-intervention assessment occasion.

The *Depression Stigma Scale* (DSS; Griffiths et al., 2004) is an 18-item measure that assesses personal and perceived stigma towards depression. For the purposes of the current study, stigma was assessed using the 9-item personal stigma subscale (DSS−Personal). These items require the participant to rate how strongly they personally agree with a statement about depression (e.g., 'people with depression are unpredictable') on a 5-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree). The sum of each of the items yields a total stigma score, where higher scores indicate greater stigma. The personal stigma subscale of the DSS has been shown to have moderate internal consistency in an adolescent sample (Calear, Griffiths, & Christensen, 2011). In the current study, reliability was found to be acceptable (α = .749 at pre-intervention).

Yap, Mackinnon, Reavley, and Jorm (2014) recently showed that the factor structure of this scale may be better represented by two factors describing 'weak-not-sick' and 'dangerous/unpredictable' stigma beliefs. A similar factor structure was found in the current sample. Accordingly, in addition to the traditional scoring of the Personal Stigma Scale, these two subscales were also calculated based on Items 1, 2, 3 and 5 for the 'weak-not-sick' subscale and Items 4, 6, 8 and 9 for the 'dangerous/un-predictable' subscale.

The *Inventory of Attitudes towards Seeking Mental Health Services* (IASMHS; Mackenzie, Knox, Gekoski, & Macaulay, 2004) is a 24-item self-report measure designed to assess attitudes towards help-seeking. It consists of three subscales; Psychological Openness, Help-seeking Propensity, and Indifference to Stigma. Participants are asked to indicate how much they agree with each statement on a scale from 0 (Disagree) to 4 (Agree). The total score for each subscale is the sum of the items for that subscale, with the total help-seeking score equal to the sum of the subscale totals. Higher scores indicate more favourable attitudes towards help-seeking. Within a student sample, the measure demonstrated the ability to discriminate between those who had used mental health services previously and those who had not, and predicted who would and would not use such services in the future (Mackenzie et al., 2004). Internal consistency of the overall measure and the subscales is strong (Mackenzie et al., 2004) and the IASMHS demonstrates good convergent validity (Mackenzie, Gekoski, & Knox, 2006).

Psychological distress was measured using the 21-item version of the *Depression Anxiety and Stress Scales* (DASS-21; Lovibond & Lovibond, 1995), which yields subscale totals for depression, stress and anxiety, and an overall total index of psychological distress. Participants are asked to indicate how much each statement applies to them over the previous week on a scale from 0 (not at all) to 3 (most of the time). There is evidence to support the reliability and validity of these scales in an adolescent population (Szabo, 2010). In the current sample, Cronbach's α was .93.

Six items adapted from the *Moods and Feelings Questionnaire* (MFQ; Angold, Costello, Pickles, Winder, & Silver, 1987) were used to measure suicidal ideation. Participants were asked to indicate their level of agreement with each statement on a 3-point scale (0 = not true, 1 = sometimes true and 2 = true). This approach has been used previously by other researchers to assess thoughts of death and suicide (e.g., Vander Stoep, McCauley, Flynn, & Stone, 2009). The composite of the six items represents a single, internally consistent factor (α = .864).

Sample size

A power analysis was conducted to determine the number of participants required to detect a small effect. This effect size was chosen as HeadStrong is a preventative educational program, and thus, we presumed its effects may be modest in comparison to those typically associated with a more intensive treatment program. Results of the power calculation indicated that a total of 1554 students would be required to detect a small effect (d = .2), where α = .05, β = .1 and the intracluster correlation coefficient (ICC), ρ = .02. This ICC was based on those utilised in similar educational trials (e.g., Spence, Sheffield, & Donovan, 2003). The power analysis was informed by methods outlined in Campbell, Thomson, Ramsay, MacLennan, and Grimshaw (2004). Based on this sample size, a total of 30 schools and 60 classes (clusters) with 25 students each is required for this trial. As noted above, due to the expense and time associated with implementing a large-scale prevention trial in the community, the trial will be implemented in stages. 10 schools and 19 classes (clusters) participated in the current phase of the trial.

Randomisation

We conducted the trial in accordance with the CONSORT statement for cluster randomised trials. Clusters were defined at the classroom level because HeadStrong was delivered to classrooms not individuals. However, randomisation occurred at the school level as class-level randomisation was inappropriate due to the potential for contamination effects. Stratification was based on school type and occurred at two levels: i) Catholic or Independent and ii) single-sex or co-educational.

Randomisation was conducted by the trial manager who was not involved in any data analysis. Schools were grouped in matching pairs according to the stratification variables. A coin-toss approach was then used to randomise one of each pair to the intervention and the other to the control condition. Group assignment was concealed from researchers involved in data analysis. Participants could not be blinded to group allocation due to the nature of the intervention.

Statistical methods

Logistic regressions were conducted to identify significant predictors of missingness at post-intervention and 6-month follow-up assessment occasions. Predictors included baseline mental health literacy and psychological distress, age,

gender, school, class, and condition. Independent samples t-tests and chi-square analyses were used to identify potential pre-intervention group differences in demographics and mental health literacy. Effectiveness analyses were based on the analytic strategy used in similar school-based intervention studies (e.g., Calear, Christensen, Mackinnon, Griffiths, & O'Kearney, 2009). Mean substitution was used for continuous variables where less than 10% of data were missing for any given scale. Analyses were conducted on an intention-to-treat basis using mixed-model repeated measures (MMRM) analysis of variance to account for participants with missing data. Measurement occasion (pre-intervention, post-intervention, follow-up) and condition (intervention, control) represented within and between factors, respectively. A random factor of school class was also entered to account for the clustered sampling of students within classes and schools. Age was included as a covariate in all MMRM analyses. Cohen's d was used to calculate effect sizes.

Results

Baseline data

At pre-intervention, participants in the HeadStrong group were slightly older ($M = 14.97$, SD = .60 years) than control participants ($M = 14.52$, SD = .41 years), $t(358) = 8.44$, $p < .05$. No significant differences were detected between groups on any other demographic variables, including gender, primary language spoken at home, indigenous status, parents' marital status, living situation (i.e. who the participant resides with), or general health. Groups did not differ at pre-intervention on mental health literacy, or any other outcome variables.

Missingness

A flow chart of participant recruitment and retention at the individual, cluster and school level is provided in Fig. 1. No schools formally withdrew from the study, however, seven classes randomised to the intervention condition and nine to the control condition elected not to participate in the trial. Further, two control schools did not return any assessment measures, and two additional schools (one control, one intervention) failed to return participant data on one or more assessment occasions.

In total, data were obtained from 380 participants at baseline, 322 participants post-intervention and 208 participants at 6-month follow-up. The missingness analysis revealed that condition, class, school and gender significantly predicted missing data at post-intervention and follow-up. A greater proportion of individuals in the intervention condition was missing assessments at post-intervention than those in the control group (22.8% vs. 6.4%), $\chi^2 = 19.65$, $p < .05$, however, the reverse was true at follow-up (33.3% vs. 59.5%), $\chi^2 = 26.12$, $p < .05$. At post-intervention, females were slightly more likely than males to have missing data, OR = .38, 95% CI [.21, .70], however at follow-up, males were significantly more likely to have missing data, OR = 4.74, 95% CI [3.06, 7.34]. As both the intervention and assessment measures were completed in a classroom setting, missing data was largely due to specific schools or classes failing to complete or return assessment measures. For example, four classes from an all-girls school did not return any assessment measures at 6-month follow-up.

Outcomes

Observed means and standard deviations for outcome variables at each assessment occasion are provided in Table 1.

Estimated marginal means for mental health literacy and personal stigma are presented in Fig. 2. With regards to literacy, the interaction between condition and measurement occasion was significant, $F(2, 494) = 14.63$, $p < .05$, indicating that groups changed differently over the three assessment occasions. Analysis of planned contrasts revealed that those in the HeadStrong group improved more than control participants from pre- to post-intervention, $t(492) = 5.33$, $p < .05$, and between pre-intervention and follow-up, $t(494) = 2.87$, $p < .05$. The difference between post-intervention and follow-up was not significant ($p = .131$). On average, D-Lit scores for HeadStrong participants were 2.19 ($d = .60$) and 1.39 ($d = .37$) points higher than for control participants at post-intervention and follow-up, respectively.

An interaction effect was also found for personal stigma, $F(2, 520) = 3.86$, $p < .05$. HeadStrong participants improved more than controls from pre-intervention to follow-up, $t(522) = 2.67$, $p < .05$, though only a marginally significant difference was detected between groups between pre- and post-intervention assessments, $t(517) = 1.74$, $p = .082$. Personal stigma scores for HeadStrong participants were 2.59 points lower than for control participants at post-intervention ($d = .46$). At follow-up, this difference extended to 3.46 points between groups ($d = .62$).

Analysis of the personal stigma subscales defined by Yap et al. (2014) revealed a significant time by condition interaction for the dangerous/unpredictable factor, $F(2, 527) = 3.17$, $p < .05$, but not for the weak-not-sick factor, $F(2, 529) = 1.91$, $p = .149$. Stigmatising beliefs about danger and unpredictability reduced more in HeadStrong participants relative to controls between pre- and post-intervention assessments, $t(532) = 2.08$, $p < .05$, and between pre-intervention and follow-up assessments, $t(521) = 2.11$, $p < .05$. A main effect for time indicated similar reductions in both HeadStrong and control participants' views of individuals with mental illness as weak.

No differences were found within or between groups on attitudes towards help-seeking, psychological distress, or suicidal ideation.
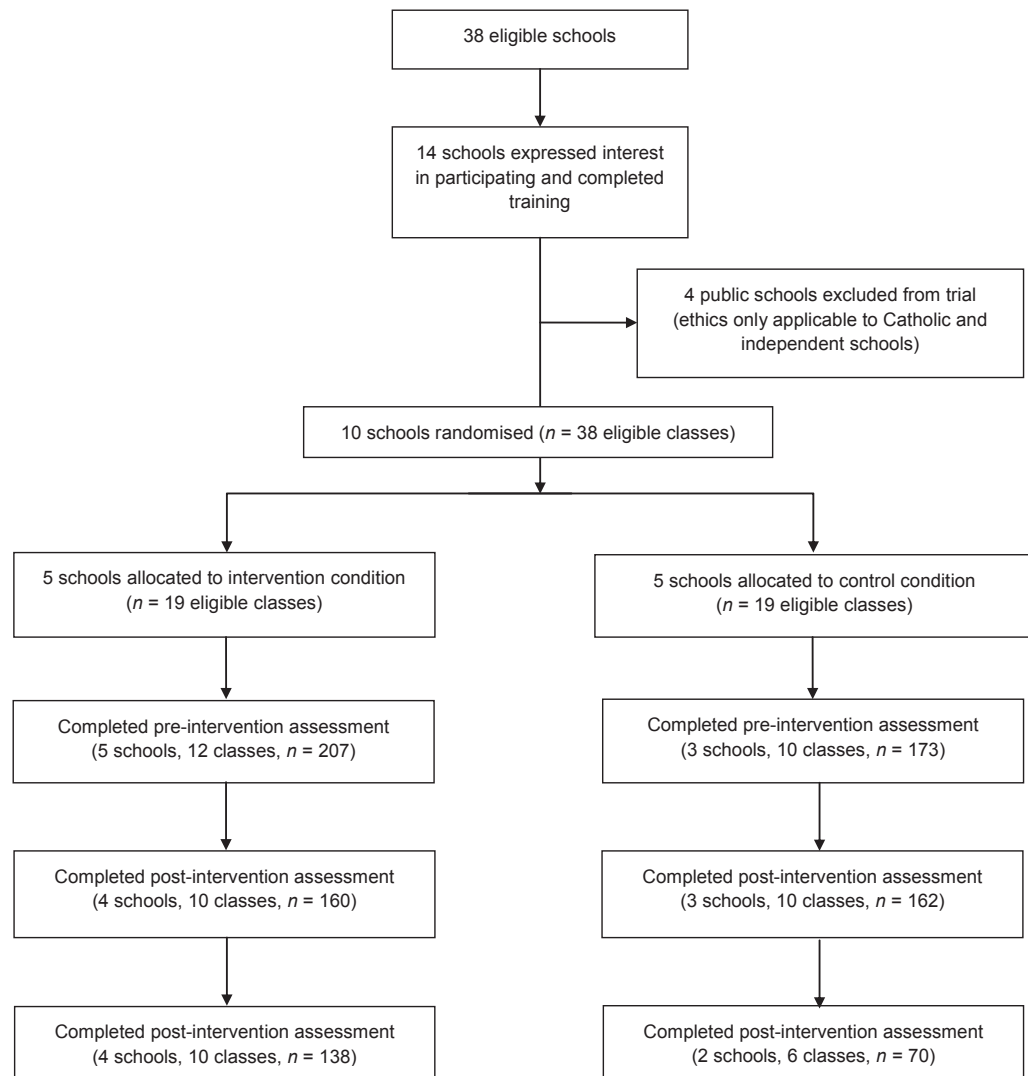
Fig. 1. Participant flow diagram.

Table 1
Observed means and standard deviations for outcome variables at pre- and post-intervention, and 6-month follow-up for HeadStrong (HS) and Control (C) conditions.

Measure	Pre-intervention		Post-intervention		6-month follow-up	
	HS	C	HS	C	HS	C
D-Lit						
M (SD)	11.34 (3.02)	10.87 (3.43)	14.76 (3.84)	12.07 (3.54)	14.27 (4.65)	13.09 (3.15)
N	189	149	153	134	128	66
DSS−Personal						
M (SD)	10.90 (5.12)	11.95 (5.78)	9.80 (5.69)	11.79 (5.68)	8.61 (5.29)	10.22 (5.88)
N	199	157	157	155	137	67
IASMHS						
M (SD)	56.55 (11.09)	55.74 (12.50)	56.79 (12.42)	56.17 (12.50)	56.86 (12.65)	57.13 (13.41)
N	200	162	159	153	137	67
DASS						
M (SD)	24.90 (20.77)	22.08 (20.38)	23.09 (20.07)	20.80 (20.97)	21.70 (18.88)	23.31 (21.29)
N	205	171	160	158	138	70
MFQ						
M (SD)	1.36 (2.36)	1.04 (1.98)	1.35 (2.63)	.96 (2.03)	.99 (2.29)	1.24 (2.44)
N	205	169	160	159	136	70

Note. D-Lit = Depression Literacy Scale; DSS−Personal = Depression Stigma Scale − Personal Stigma Subscale; IASMHS = Inventory of Attitudes towards Seeking Mental Health Services; DASS = Depression Anxiety Stress Scales; MFQ = Moods and Feelings Questionnaire.
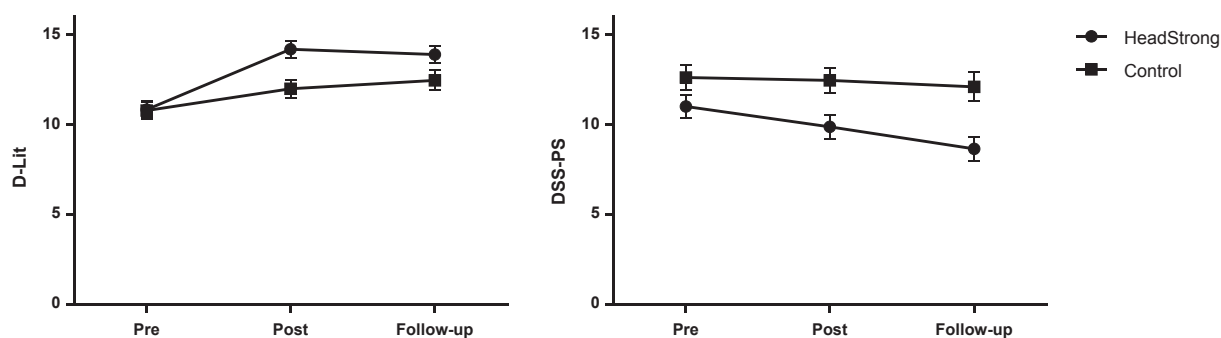
Fig. 2. Estimated marginal means for Depression Literacy Scale (D-Lit) and Depression Stigma Scale − Personal Stigma Subscale (DSS−Personal) scores estimated in Condition × Measurement Occasion model. Error bars depict standard errors of the means.

Discussion

The current study provides preliminary evidence that HeadStrong is effective in improving mental health literacy. This effect is moderate to large (Cohen, 1992) immediately post-intervention, but weakens over time, suggesting supplementary teaching is required throughout the year. The program also reduced stigma around depression at 6-month follow-up. This finding is consistent with previous research indicating positive associations between education and stigma reduction in adolescents (Corrigan, Morris, Michaels, Rafacz, & Rüsch, 2012). More specifically, participating in the HeadStrong program, but not regular PDHPE classes, weakened students' beliefs that mental illness makes people dangerous and unpredictable. This finding is particularly important, as research in adolescents has shown that perceived dangerousness is associated with discrimination against individuals with mental illness (Corrigan et al., 2005). Specifically, adolescents who view peers with mental illness as dangerous are more likely to fear and avoid them. Future research into the impact of HeadStrong should incorporate measures of social avoidance and discrimination to assess whether the positive effects on attitudes extend to discriminatory behaviour.

Despite the positive findings for both mental health literacy and stigma, the HeadStrong program did not significantly impact upon participants' attitudes towards help-seeking. One possible explanation for these null findings is the insufficient dose or duration of the program. Findings from the current study indicate that mental health literacy declines over time (without additional learning), while the impact of the intervention on stigma may take some time to take effect. Given that these factors are cited as the most common barriers to help-seeking (Gulliver et al., 2010), it is possible that the presence of even one of these obstacles is sufficient to inhibit improvements in help-seeking attitudes. This implies that a more sustained intervention which explicitly and concurrently addresses both of these barriers may be required to encourage young people to change their attitudes towards help-seeking. We are planning to update and refine the HeadStrong resource, with a view to enhancing the impact of the program on help-seeking outcomes.

HeadStrong did not significantly impact upon psychological distress or suicidal ideation. This is likely due to the low base rates of these presentations in the current study. Given the universal nature of the sample, it is unsurprising that mean baseline scores for depression, anxiety and stress were all in the normal range, and the average response on the measure of suicidal ideation reflected an endorsement of just one item, some of the time. In addition, increased help-seeking was proposed as a potential conduit to enhanced psychological functioning and reduced suicidal ideation. However, help-seeking did not significantly improve in the current study.

Limitations

A number of limitations are worth noting. First, the primary outcome measure was designed specifically to assess mental health knowledge in relation to the HeadStrong program and is not a validated measure. Nevertheless, this approach is commonly utilised in studies assessing knowledge acquisition pertaining to educational programs (e.g., Burns & Rapee, 2006; Han, Chen, Hwang, & Wei, 2006; Ritterfeld & Jin, 2006) and the outcome measure was been adapted from an existing mental health literacy questionnaire (Griffiths et al., 2004). Second, the study was conducted in Catholic and Independent schools in Central West NSW. Although the sample utilised was universal, replication is required in more diverse settings in order to attest to the generalisability of these findings. The next phase of the trial will include schools from urban areas and the public school system.

A number of teachers encountered difficulties following research procedures, resulting in several schools failing to complete and return student questionnaires on time. These challenges will be overcome in the next stage of the trial by the research team offering more support to teachers, and utilising online surveys to ensure direct delivery of measures to students. Additionally, one control school elected to deliver the HeadStrong program following the post-intervention assessment, but prior to the 6-month follow-up. Data from this school was retained in the analysis. It should be noted, however, that its influence was likely to weaken any effects observed at the follow-up analysis.

Finally, although positive results were found in the current study, no process variables were collected. Accordingly, it is not clear to what extent teachers and principals found the program to be feasible and acceptable, and how willing they would be to continue to use the HeadStrong resource in the future. In a small-scale usability analysis conducted with teachers during the initial piloting of the resource in 2010–2011, HeadStrong was considered relevant, credible and well-presented. However, more formal measurement and analysis of stakeholder attitudes towards program acceptability will be included in the next phase of the trial. This will allow for a better understanding of barriers to implementation and maintenance of the program in the school system.

Significance of this study

This randomised controlled trial demonstrated improved mental health literacy and reduced stigma in a large sample of adolescents using a school-based, educational program. The current findings bolster confidence in previous research which found positive results, but suffered from methodological limitations (Battaglia et al., 1990; Esters et al., 1998; Pinto-Foltz et al., 2011; Rahman et al., 1998). In particular, the current trial boasts a considerable sample size, extended follow-up period and randomisation at the school level, all of which represent a methodological improvement on previous studies in this field.

Given the universal nature of this sample, these findings suggest great scope for generalisability across the school system, though replication is required in more diverse settings. Although tentative, the present results also demonstrate the potential for HeadStrong to impact upon students' discriminatory behaviour, by changing perceptions around the dangerousness of individuals with mental illness. This study has also highlighted the importance of sustained program delivery, in order to maintain positive effects on knowledge, observe reductions in stigma and potentially impact upon help-seeking attitudes.

The first phase of this trial has allowed for the refinement of operational issues and implementation procedures. Further, results indicate that the HeadStrong program is associated with a moderate effect size for mental health literacy and personal stigma. This information will be utilised to adjust the sample size in subsequent evaluations of this resource. We are currently unable to proceed with the second phase of the trial due to a lack of resources and the proposed review of the HeadStrong resource. However, we hope to be able to continue and extend our evaluation of HeadStrong in the future. If shown to be effective and acceptable in this next phase, there is potential for HeadStrong to be rolled out in secondary schools across the nation, and to have a significant impact on the wellbeing of young Australians. Through increased understanding of mental illness and reduced stigma, adolescents with mental health difficulties will be better placed to access the care they need.

Ethics

Ethics approval was provided by the University of New South Wales and Charles Sturt University Human Research Ethics Committees.

Trial Registration

This trial is registered with the Australian New Zealand Clinical Trials Registry (ACTRN12613000823774).

Protocol

A protocol for the current trial is available upon request from the corresponding author.

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