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Preventing Adolescent Depression in Mauritius: A Universal School-Based Program

Emilie Rivet-Duval, Sandra Heriot & Caroline Hunt

School of Psychology (F12), University of Sydney, NSW 2006, Australia. E-mail: caroline@psych.usyd.edu.au

Background: This study evaluated the efficacy of a universal prevention program for adolescent depresssion implemented by school teachers in Mauritius. **Method:** 160 adolescents were randomly assigned to the prevention program or wait-list. **Results:** Decreased depressive symptoms for the intervention condition were found post-intervention, but not at follow-up. Significant changes in self-esteem and coping skills were seen both post-intervention and at the follow-up. **Conclusions:** The results, drawing from a culturally diverse population, suggest that universal programs such as RAP-A may be better seen as promoting positive mental health, rather than having direct prevention or intervention effects on clinical problems.

Key Practitioner Message

The question of whether universal school-based programs can prevent depression in adolescents is unclear, with mixed findings from previous studies. The current study suggests that universal programs such as RAP:

- are acceptable to students and can be implemented by teachers in diverse cultural settings such as Mauritius
- can decrease symptoms of depression in the short-term, but appear to have little impact on symptoms in the longer term
- may have a more significant and longer term impact on increasing positive mental health, such as enhanced self-esteem and adaptive coping skills

Keywords: Depression; prevention; adolescents; universal school-based programs

Introduction

The emergence of depression in adolescence is associated with significant disability (Lewinsohn et al., 2003) and increased risk of further episodes of depression into adulthood (Fergusson et al., 2005). Evaluation of prevention programs has focused largely on targeting individual risk factors as a predisposition to depression (selective prevention) or on individuals who show subclinical symptoms of depression (indicated prevention), as opposed to targeting whole population groups (universal prevention) (Greenberg, Domitrovich, & Bumbarger, 2001; Horowitz & Garber, 2006; Spence, Sheffield, & Donovan, 2003). A number of investigations of universal prevention programs focus specifically on prevention of adolescent depression in the school setting.

The main aim of universal prevention programs is to prevent or delay the onset of depressive symptoms by providing a framework for enhancing adolescents' mental health. This is done primarily by teaching life skills such as problem-solving, leadership, optimism, and communication. A number of programs have been shown to reduce depressive symptoms following the intervention and after several months of follow-up (e.g. Gillham et al., 2007; Horowitz et al., 2007; Possel et al., 2004; Quayle et al., 2001; Shochet et al., 2001), while others have found no significant intervention effects (e.g. Harnett & Dadds, 2004; Pattison & Lynd-Stevenson, 2001; Sheffield et al., 2006; Spence et al., 2003). These mixed findings and the lack of evidence for intervention effects in the longer-term (12 months or more) have led Spence and Shortt (2007) to conclude that there is insufficient evidence to support the efficacy and effectiveness of current universal school-based approaches to the prevention of depression in adolescence. Furthermore, a meta-analytic review of studies preventing depressive symptoms in children and adolescents showed that, in general, both selective and indicated programs were significantly more effective than universal programs at follow-up (Horowitz & Garber, 2006). There may be a number of factors that limit the effectiveness of universal programs, such as dilution of the intervention when delivered to a whole school class, or an emphasis on the prevention of clinical levels of depression when in fact the majority of children will not become depressed in the absence of any intervention.

However, while a short-term decrease in depressive symptoms may be important in the light of evidence of stability of these symptoms over time (e.g. DuBois et al., 1995), the more important impact of universal interventions may be on factors that promote or enhance positive mental health and well-being in their own right. For example, long-term prospective data from the Dunedin Multidisciplinary Health and Development Study suggest that high self-esteem in adolescence, independent of levels of depression, protects against

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negative real-world consequences during adulthood (Trzesniewski et al., 2006). Furthermore, universal approaches have particular relevance where a high level of stigma associated with mental health intervention exists, and where there is a high unmet need for mental health services.

This study aimed to investigate the efficacy and acceptability of a universal prevention program in Mauritian school settings. Mauritius is a small, densely populated country with approximately 1.2 million inhabitants, half Hindu, one-fifth Muslim and the rest mainly Chinese, Creole or Franco-Mauritians. While the official language is English, the spoken language is French and there is a significant cultural influence from both France and England. Mauritius represents a highly diverse multi-ethnic and rapidly developing nation, but with largely Western cultural influences. According to the International Organisation of Health (L'Organisation Mondiale de la Sante), the Republic of Mauritius has had the highest suicide rate in Africa. While there are no statistics available for the prevalence of depressive disorder among Mauritian adolescents, the low rate of mental health specialists (approximately 1 psychiatrist and 1 psychologist per 100,000 of population) (World Health Organisation, 2005) suggests a high level of unmet need for the treatment of mental disorders, and is a strong argument for the need to assess preventative programs. While we are not aware of specific literature about attitudes to mental illness or its treatment, we note that there is not a high level of mental health literacy in Mauritius. Mauritians' perceptions of mental illness tends to be associated with 'being crazy' or unable to function and there is some resistance to seeking treatment for a mental health problem. Universal programs are known to be less stigmatising and there is usually more willingness to participate and low dropout rates (Horowitz & Garber, 2006).

The Resourceful Adolescent Program (Adolescent and Parent versions: RAP-A and RAP-P) is a universal prevention program that is based on cognitive-behavioural and interpersonal therapies and has been evaluated in a number of controlled trials (Harnett & Dadds, 2004; Merry et al., 2004; Shochet et al., 2001). Many reports indicate reductions in depressive symptoms and hopelessness at post-intervention and follow-up, as well as benefits for adolescents who were initially considered healthy. For example, a significant difference was found in the clinical and health status at follow-up between RAP and waitlist groups for initially healthy participants, where none of the healthy adolescents in the RAP group moved into the subclinical category compared to 10.1% from the waitlist group (Shochet et al., 2001). Two later studies using teachers to deliver the program have not produced substantial effects for the RAP program over control conditions (Harnett & Dadds, 2004; Merry et al., 2004). In sum, RAP outcomes to date are mixed but the studies are not without methodological limitations (Spence & Shortt, 2007). On the positive side, the RAP program has been implemented with high recruitment rates, low attrition rates and satisfactory attendance rates (Shochet et al., 2001). A critical question is whether RAP can decrease depressive symptoms and enhance mental well-being in culturally diverse populations. Previous studies of a preventative school-based universal program targeting depression (the Penn Resiliency Program) have shown inconsistent results across different cultural groups, with significant differences between intervention and control conditions reported for Chinese and Puerto Rican children but not African American children (Cardemil et al., 2007; Yu & Seligman, 2002).

This study aimed to partially replicate the study by Shochet et al. (2001) in Mauritian school settings. When RAP-A was presented to adolescents and their parents, a coping skills enhancement approach was emphasized. Teachers delivered the program to further reduce possible stigma. We hypothesized that RAP-A would be significantly better than a waitlist control condition in preventing symptoms of depression and hopelessness, and increasing self-esteem and coping skills, at post-intervention and at a 6-month follow-up. The assessment of aspects of positive mental health was important in the light of our aim to increase psychological resilience in young people, which included the promotion of positive coping strategies and maintenance of self-esteem in the face of a variety of stressors.

Method

Participants

Participants were 160 children and adolescents from two single-sex secondary public schools in Mauritius. There were equal numbers of girls and boys in the sample, half of whom were in Year 7 and half in Year 9. Ages ranged from 12 to 16 years; mean age for the RAP-A Group (Intervention Group) was 13.7 years (SD = 0.9) and 14.2 years (SD = 1.3) for the Control Group. The RAP-A program was developed specifically to target young people in this age range. The nationality of the majority of participants was Mauritian (97.5%) and the sample was representative of the ethnic (primarily Creole, Hindu and Muslim) and religious (primarily Christian, Hindu and Muslim) backgrounds of the Mauritian population (see Table 1). Almost all participants lived with their nuclear families, and the majority had at least one parent employed on a full-time basis. Socioeconomic status (SES) based on monthly parental incomes was coded according to the Mauritian Central Statistics Office, 2002.

Procedures

Ethics approval was obtained from the University of Sydney (Australia) Human Ethics Committee. All students in Years 7 and 9 at two single-sex schools were invited to participate. No students were identified as having intellectual disability or major psychiatric disorder based upon parent and teacher report. One hundred and sixty students and their parents provided written consent to participate. Students were randomly assigned at an individual level to either the RAP-A (Intervention) or waitlist (Control) condition within their class groups. Twenty students were assigned to each condition, within each grade (Year 7 and Year 9) and within each school (n = 2), resulting in 80 participants in each condition. The conditions were therefore balanced for grade and gender. Given the nature of the program, it was possible that students would share information about sessions with their peers. Therefore, while all recruitment was conducted at the same time, the

Table 1. Participant demographic information

	Intervention (n = 80)	Control (n = 80)
Ethnicity (n)		
Creole	29	30
Hindu	26	24
Muslim	10	14
Chinese	10	12
European	5	0
Religion (n)		
Christian	41	41
Hindu	26	24
Muslim	11	15
Mixed religion	2	0
Living arrangements (n)		
Either parent	5	2
Both parents	58	55
Both parents with grandparents	17	23
Employment (n)		
Father-employed	70	76
Father-unemployed	10	4
Mother-employed	28	43
Mother-unemployed	52	37
Household income (n)		
< Rs 5,000	12	4
Btw Rs 5,000 and Rs 15,000	14	17
Btw Rs15,000 and Rs,25,000	23	30
> Rs 25,000	31	29

Intervention and Control conditions within each school grade were run in different years, with the groups randomly assigned to either 2003 or 2004. Year 7 students in the girls' school and both year 9 groups completed the intervention in 2003, with the remaining Year 7 boys' school group completing the intervention in 2004.

Assessment. All students were assessed on three occasions: 1) pre-intervention; 2) post-intervention; and 3) 6-month follow-up. Pre-intervention assessments occurred at the start of the school semester and follow-up assessments at the end of the next school semester during the year to which the student groups were assigned (2003 or 2004). Students completed the questionnaires in class, supervised by teachers running the program. All forms were scored by the primary researcher (not blinded to group allocation). In accordance with the ethical protocol, the parents and/or caregivers of students (n = 6 in RAP-A and n = 10 in the Control condition) who scored in the clinical range on the Reynolds Adolescent Depression Scale-2 (RADS-2; T-score> 70), the Beck Hopelessness Scale (BHS; RS>9) or the Hopelessness Scale for Children (HSC; RS>8) were contacted by the adolescent's teacher and encouraged to contact a clinical psychologist for further assessment.

RAP-A program. The RAP-A program is a manualised group treatment program developed by Shochet, Holland and Whitefield (1997a, b). It involved 11 one-hour weekly sessions with 8 to 12 participants per group. It included both cognitive-behavioural and interpersonal approaches covering topics such as building self-esteem, keeping calm, self-talk, thinking resourcefully, problem solving, identifying and accessing support networks, considering the perspective of others and keeping the peace. To maintain program integrity, the program was delivered in English and the overall structure and content of the program was unchanged. The English language was not perceived as a difficulty by students or teachers, as Mauritian children are taught in the English language and use English textbooks from the age of 5 years (primary school). Therefore Mauritian students are very comfortable with the use of English and the spoken home language can be English, French or Mauritian Creole. The cultural relevance of the program was discussed with the program facilitators (teachers) and their feedback indicated that no changes were required to the program.

Program facilitators were eight experienced teachers (six females, two males), four from each school. Facilitators attended a 2-day training workshop involving 16 hours of training conducted by one of the research team who was a certified RAP trainer; this trainer also provided ongoing support for the teachers when required. The training workshop involved: 1) information on adolescent mental health, and specifically adolescent depression; 2) theory underlying the program; 3) program content and implementation techniques. To maintain program integrity**,** one half-day booster training session was organised 6 months following initial training.

Measures

Participant demographic questionnaire. Participants completed a demographic questionnaire providing details on age, gender, school, grades, nationality, ethnicity, religion, living arrangements, main carer's occupation, and total household income.

Depressive symptoms. a) The Reynolds Adolescent Depression Scale-2 (RADS-2) (Reynolds, 2002) is a 30-item self-report measure of adolescent depressive symptoms. The reliability and validity of the RADS-2 are adequate. This measure was administered to all students. b) The Beck Hopelessness Scale (BHS) (Beck & Steer, 1988; Beck et al., 1974) consists of 20 true-false items measuring three major aspects of hopelessness: feelings about the future, loss of motivation, and expectations. This measure was used for Year 9 students. c) The Hopelessness Scale for Children (HSC) (Kazdin et al., 1983) is a 17 true-false item instrument, modeled after the BHS. This measure was used for Year 7 students. Both hopelessness scales have well-established psychometric properties.

Coping skills. The Youth Coping Index (YCI) (McCubbin et al., 1996) is a 31-item instrument designed to assess the degree to which youth use certain coping behaviours to manage stressors, namely: spiritual and personal development, positive appraisal, problem solving, incendiary communication, and tension management. Higher scores reflect better coping skills. The measure has adequate psychometric properties for use with adolescents.

Self-esteem. The Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1979) is a 10-item scale designed to

measure self-esteem in adolescence. Items are rated on a scale ranging from 1 (strongly agree) to 4 (strongly disagree), higher scores reflecting lower self-esteem. It has been found to be a reliable and valid measure of overall global feelings of self-worth (Blascovich & Tomaka, 1991).

Process evaluation. All adolescents who participated in the RAP-A program completed standardised RAP-A process evaluation forms. Participants rated and commented on specific aspects of the program, (e.g. enjoyment, usefulness of the skills taught, changes in behaviour) following participation. Students in the RAP-A rated the usefulness and acceptability of the program as high, $M = 4.57$ ($SD = 0.78$).

Attendance. Only three students missed one session throughout the entire program. All students completed the program and all the assessment measures at pre, post and follow-up intervention. There were no missing data.

Results

Students in the two conditions did not differ significantly in nationality, ethnicity, religion, living arrangements, maternal and paternal employment, or household income. Furthermore, there were no significant differences between the groups prior to the intervention across all four outcome measures.

In order to predict depression, hopelessness, self-esteem and coping skills based on intervention group status, we conducted a series of analyses of covariance with pre-intervention scores as covariates. Effect sizes (ES) were calculated using Cohen's *d*. Means and standard deviations are presented in Tables 2 and 3. Controlling for pre-intervention RADS-2 scores, there was a significant main effect at post-intervention ($F(1,157) = 12.65$, $p < .001$) but not at follow-up ($F(1,157) = 0.63$, *ns*). The intervention group showed lower RADS-2 scores than the control group at post-intervention (ES = −0.32) but were similar to the control group at follow-up (ES = −0.02).

Because two hopelessness measures were used in each of the year groups (the BHS for Year 9 students and the HSC for Year 7 students) these scores were converted to Z scores and combined into a single 'hopelessness' scale. Controlling for pre-intervention hopelessness, there was a significant main effect at post-intervention, with the intervention group showing lower hopelessness scores than the control group ($F(1,157) = 19.6$, $p < .001$, ES = −0.42). This effect was not found at follow-up ($F(1,157) = 2.59$, *ns*, ES = −0.08).

Controlling for pre-intervention RSE scores, there was a significant main effect at both post-intervention ($F(1,157) = 25.0$, $p < .001$, ES = -0.67) and follow-up ($F(1,157) = 8.33$, $p < .01$, ES = -0.46). Likewise, controlling for pre-intervention YCI scores, there was a significant main effect at both post-intervention ($F(1,157) = 11.0$, $p < .001$, ES = 0.32) and follow-up ($F(1,157) = 6.75$, $p < .01$, ES = 0.27). The intervention condition showed more positive self-esteem and coping skills at post-intervention and follow-up relative to the control condition.

Discussion

Results showed a significant short-term intervention effect for depressive symptoms, hopelessness, self-esteem

Table 2. Means and standard deviations of outcome measures at preintervention, postintervention and follow-up for intervention and control groups

	RAP-A group			Control group		
	Pre	Post	Follow-up	Pre	Post	Follow-up
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*	*M* (*SD*)
RADS-2 (*n* = 160)	51.81 (9.07)	47.45 (7.95)	49.74 (9.19)	50.61 (9.70)	50.49 (10.94)	49.98 (11.07)
BHS (*n* = 80)	6.15 (3.53)	3.25 (2.83)	5.05 (3.88)	4.80 (4.11)	4.60 (4.85)	4.95 (4.44)
HSC (*n* = 80)	4.68 (3.20)	2.55 (2.12)	2.88 (2.30)	3.78 (2.85)	3.93 (3.33)	3.45 (3.76)
YCI (*n* = 160)	94.15 (11.63)	102.74 (13.05)	99.30 (12.87)	97.15 (11.72)	98.31 (14.27)	95.83 (12.92)
RSE (*n* = 160)	21.29 (3.88)	18.33 (3.97)	18.64 (4.54)	21.85 (5.21)	21.46 (5.21)	20.80 (4.92)

Note: Reynolds Adolescent Depression Scale-2 (RADS-2), Youth Coping Index (YCI), Rosenberg Self-esteem (RSE) (full sample); Beck Hopelessness Scale (BHS) (Year 9), Hopelessness Scale for Children (HSC) (Year 7)

Table 3. Means and standard deviations of YCI and RSE at preintervention, postintervention and follow-up for intervention and control groups

	RAP-A group						Control group					
	Pre		Post		Follow-up		Pre		Post		Follow-up	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
YCI	94.15	11.63	102.74	13.05	99.30	12.87	97.15	11.72	98.31	14.27	95.83	12.92
RSE	21.29	3.88	18.38	3.97	18.64	4.54	21.85	4.79	21.46	5.21	20.80	4.92

Note: YCI = Youth Coping Index; RSE = Rosenberg Self-esteem

and coping skills. These findings are consistent with previous research indicating significant short-term benefits from the RAP program. However, improvements in depressive symptoms and hopelessness for students who received the RAP program compared to the control sample were not maintained at the 6-month follow-up. Reviews of prevention programs among adolescent populations suggest that outcomes may dissipate across time (e.g. Gillham & Reivich, 1999; Spence et al., 2003; Spence, Sheffield, & Donovan, 2005).

Adolescents in the RAP-A Group showed improvements in self-esteem and coping skills at post-intervention and follow-up compared with those in the Control group. These findings are important given our aim to increase psychological resilience in the young people in our sample, including the promotion of positive coping strategies and maintenance of self-esteem in the face of a variety of stressors. While these changes were not reflected in the level of depressive symptoms, it must be acknowledged that such symptoms were generally low across the whole sample, and there may have been a floor effect in operation. Overall findings suggest that universal programs such as RAP-A may be better seen as promoting positive mental health rather than having direct prevention or intervention effects on clinical problems.

A number of limitations of the study require discussion. In terms of assessment, none of the measures had been previously used or validated in samples from Mauritius. While the measures have been well-validated in other populations, and previous research has not found any significant differences in mental health constructs in Mauritian children (Scarpa et al., 1995), it is possible that the measures did not provide a valid assessment in this sample. No interviewer-based assessments were used, and there was no direct assessment of intellectual disability or major psychiatric disorders, relying instead on parent and teacher report. Teachers who ran the program distributed the self-report outcome measures, which may also have compromised the validity of the results, and limited resources did not allow the monitoring of treatment. Lastly, the follow-up was limited to 6 months following the intervention and a placebo control group was not included.

Despite these limitations, the study has a number of significant strengths. The research adds to a growing literature documenting the limited effectiveness of universal prevention programs on depressive symptoms in adolescence, and does so in a specific cultural context. The research used a randomised controlled design and well-validated outcome measures. Consistent with Harnett and Dadds (2004), all teachers were highly motivated, cooperative and willing to implement the RAP-A program, which probably contributed to the high retention in the study. The universal nature of the program may be associated with reduced risk for stigmatisation, making it more readily accepted and adopted by adolescents compared to selective or indicated prevention programs (Shochet et al., 2001; Shochet & Ham, 2004).

In conclusion, the results of this study are consistent with previous findings of universal prevention programs for depression. That is, short-term effects for depressive symptoms are apparent, but these are not maintained at follow-up. On the other hand, aspects of positive mental health (self esteem and coping skills) improved in the intervention sample and these changes were maintained across time. This finding may reflect the impact that such universal programs have on mental health promotion rather than the prevention of depression. Furthermore, the study demonstrates that the results of programs such as RAP-A can generalise to different cultural populations such as Mauritius. Future research will be needed to determine whether universally applied programs can indeed promote aspects of positive mental heath that will have a significant and long-lasting effect on the health and well-being of young people.

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