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Life Smart: A pilot study of a school-based program to reduce the risk of both eating disorders and obesity in young-adolescent girls and boys

<table>
<thead>
<tr>
<th>Journal:</th>
<th>Journal of Pediatric Psychology</th>
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<tbody>
<tr>
<td>Key Words:</td>
<td>Eating and Feeding Disorders, Prevention/Control, Risk, Obesity</td>
</tr>
</tbody>
</table>
Abstract

Objective: To develop and pilot Life Smart, an 8-lesson program aimed at reducing risk factors for both eating disorders and obesity. Methods: Grade 7 girls and boys (N=115) from one independent school were randomly allocated to the Life Smart (2 classes; N = 51) or control (3 usual classes; N=64) conditions. Risk factors were measured at baseline and post-program (5-weeks later). Results: Life Smart was rated as moderately enjoyable and valuable by participants. ANCOVAs with baseline as a covariate revealed a significant main effect for group favouring Life Smart for shape and weight concern (Effect Size [ES] = .54), with post-hoc testing finding girls particularly benefited on this variable (ES = .78). Conclusions: Feedback was generally favourable, with some suggestions for even more interactive content. The program showed more promise with girls. Informed by these findings, the program underwent revisions and is now being evaluated in a randomized controlled trial.

Keywords: prevention; eating disorders; obesity; risk factors
The respective fields of eating disorder prevention and obesity prevention have remained largely separate to one another over the years. However, in recent years researchers have called for the development of programs that seek to simultaneously prevent both problems (e.g., Neumark-Sztainer et al., 2006). Reasons for this include: obesity is a risk factor for disordered eating while some with disordered eating are more likely to gain weight over time (Stice, Cameron, Killen, Hayward & Taylor, 1999); the need for consistency in approaches to preventing both problems; and, a realization that preventing one problem is likely to have benefits to preventing the other problem (Austin, Field, Wiecha, Peterson & Gortmaker, 2005). However, the most important reason for seeking to combine prevention efforts is the increasingly common finding that there is overlap in the risk factors for both problems. Specifically, risk factors such as dieting, body dissatisfaction, media consumption, depressive symptoms, perfectionism, shorter sleep duration, social problems and difficulties with emotion regulation, have been found to increase the risk of both disordered eating and weight gain (Stice, Presnell, Shaw & Rohde, 2005; Haines, Neumark-Sztainer, Eisenberg & Hannan, 2006; Haines, Neumark-Sztainer, Wall & Story, 2007; Neumark-Sztainer et al., 2007). As such, an intervention that can reduce these risk factors could have a preventative effect for both problems.

Despite these calls, only two school-based programs have been investigated for their effects on both problems. First, Planet Health, a 2-year interdisciplinary obesity prevention program with girls and boys in Grades 6-8 was found to significantly reduce both obesity onset and growth of purging behaviours amongst girls in the intervention condition (Austin et al., 2005). Planet Health seeks to target traditional obesity prevention goals of: reduced television viewing, decreased consumption of high-fat foods, increased fruit and vegetable intake, and increased physical activity levels. Second, Healthy Buddies, a 21-week program pairing students in Grades 4-7 with a
student in Kindergarten – Grade 3, led to significantly lower increases in body mass index (BMI) amongst the older students in the intervention condition compared to the control condition, while no significant differences were found for the body image variables (Stock et al., 2007). This program included an equal focus on healthy eating, healthy exercise and positive body image, respectively. While not a school-based program, the Healthy Weight program by Stice and colleagues (Stice, Marti, Spoor, Presnell & Shaw, 2008) was found to reduce the risk of eating pathology by 61% and obesity by 55% in female university and high-school students relative to assessment-only controls over a three-year follow-up. This three-hour program similarly targeted traditional obesity prevention goals (e.g., healthy eating and physical activity) and was delivered to high-risk participants in small groups. These respective programs provide evidence that reduced risk can be simultaneously achieved for both eating disorders and obesity.

The current study involved the development and pilot testing of an 8-lesson school-based curriculum, Life Smart, with Grade 7 girls and boys (12-13 years of age). This program seeks to build on earlier interventions by not only including traditional obesity prevention targets, but also targeting psychological risk factors that have rarely been addressed in obesity prevention programs, namely: perfectionistic thinking; managing emotions; sleep; and, peer-teasing. These topics were selected based on their support in prospective risk factor research for weight gain and where all but sleep duration have also been implicated in the development of disordered eating (Stice et al., 2005; Haines et al., 2006; Haines et al., 2007; Neumark-Sztainer et al., 2007). The targeting of young-adolescents was also informed by these prospective studies where baseline risk factor scores at this age predicted future eating pathology, while other prevention studies have achieved significant reductions in the risk of eating pathology.
with participants of this age (e.g., Austin et al., 2005; Stock et al., 2007; Wilksch & Wade, 2009).

This paper describes the first phase of a larger research program. The primary aim was to assess student enjoyment and perceived value of Life Smart, with a view to feedback informing improvements to the program in preparation for a large randomized-controlled trial (RCT). The secondary aim was to investigate the efficacy of the program targeting a universal (including boys) sample where eating disorder behaviours are not yet likely to be present. Efficacy was judged by the impact on measures of risk factors for both eating disorders and obesity from pre- to post-intervention. While it is acknowledged that universal prevention programs require follow-up assessments to evaluate their longer-term value, our experience in developing an efficacious school-based eating disorder prevention program (Wilksch & Wade, 2009) suggests a pilot study (Wilksch, Tiggemann & Wade, 2006) can be a very helpful approach in refining program content and evaluation methodology.

Methods

Participants

Five Grade 7 classes (N=114; M age = 12.71 years, SD = .41) from one Adelaide metropolitan independent private school participated in this study where two classes (N=50; 45% girls) were randomly allocated to Life Smart and the other 3 classes (N=64; 45% girls) served as controls (usual school lessons). Randomisation of class (rather than school) was informed by Cochrane Review recommendations that this is a more methodologically rigorous approach, given that students within the same school are thought to be more alike than compared to other schools (Pratt & Woolfenden, 2002). While no additional demographic data were collected beyond student age and gender, anecdotal reports from school staff indicated the school was comprised typically white
students from middle income families. It should be noted that Grade 7 classes in South Australian schools are taught by a single teacher as opposed to students attending different classes for different subjects. As such, class allocation is random rather than being determined by other constraints.

Baseline body mass index did not significantly differ between Life Smart and Control participants for either girls (Life Smart [M = 20.92]; Control [M = 19.90]) or boys (Life Smart [M = 20.22]; Control [M = 19.23]), with percentile charts indicating each group scoring between the 60th and 75th percentile. Distribution of overweight (85th to < 95th percentile) and obesity (≥ 95th percentile) was generally even across conditions for overweight girls (Life Smart = 10%; control 13.6%) and obese girls (Life Smart = 5%; control = 6.4%), as well as across conditions for overweight boys (Life Smart = 21%; control = 17.4%) and obese boys (Life Smart = 0; control = 2.9%). The remainder of the sample was in the healthy weight range and no participants were underweight (< 5th percentile). These rates of obesity in boys were lower than current Australian obesity rates of 9% for boys, while rates for girls matched the national average of 6% (Australian Bureau of Statistics, 2012). Recruitment, assessments and intervention delivery occurred between September and December, 2010. Approval for this research was received from the Flinders University Social and Behavioural Research Ethics Committee and the school principal of the participating school.

**Intervention**

Life Smart was informed by the principles of evidence-based prevention and thus: avoided psychoeducation about eating disorders and obesity; was interactive (e.g., regular small-group work and class discussions); was of multiple-session duration; and, was evaluated with valid outcome measures (Stice, Shaw & Marti, 2007). Curriculum targets were informed by eating disorder and obesity risk factor research, with a particular focus
on shared risk factors. A central theme was taking a holistic approach where health is made up of more than just weight and eating. A deliberate effort was made to present traditional obesity program content in a manner that was concise and consistent with a positive body image message. A brief description of the program is presented in Table 1.

Curriculum activities (e.g., class presentations, skills-based learning) were largely informed by our previous experiences with eating disorder prevention (Wilksch et al., 2006; Wilksch, Durbridge & Wade, 2008; Wilksch & Wade, 2009).

**Procedure**

Based on participation in a previous trial, a metropolitan private school was invited and agreed to participate. Parental consent (hard copy consent form that was given to students to pass on to their parents who then signed and returned to the school) for data collection was high with 114 of the 119 Grade 7 students at the school (96%) participating. Following receipt of parental consent, students from five Grade 7 classes completed a baseline online battery of risk factor measures and then had their anthropometric data (height, weight and blood pressure) measured by two research assistants in a confidential manner where participants did not learn their measurements.

Over the following four weeks, two classes received the 8-lesson *Life Smart* program at the rate of two 50-minute lessons per week during lesson time normally dedicated to English lessons, while the remaining three classes participated in their usual English classes. *Life Smart* was delivered by a male Clinical Psychologist (SW), with the regular class teacher present. At the conclusion of each lesson, a brief feedback form was completed by *Life Smart* participants to assess program value and enjoyment, along with any recommendations for improving the lesson. Post-program (5-weeks after baseline), the online battery of eating disorder and obesity risk factors were again completed, where
post-program data was available from $N=43$ Life Smart participants (86% of baseline participants) and $N=57$ control participants (89% of baseline participants).

**Measures**

Measures included self-report qualitative feedback about the program and questionnaires of relevant risk factors. Risk factor measures were selected based upon their reliable use in our previous prevention trials with early-adolescents (Wilksch et al., 2006; Wilksch et al., 2008; Wilksch & Wade, 2009), while obesity risk factor measures were selected based upon their reliable use in previous large-scale longitudinal risk factor studies, namely Project Eating Amongst Teens (Project EAT; Haines et al., 2006) and the Growing Up Today Study (GUTS; Field et al., 2003). While anthropometric assessments were conducted, it was decided not to report these as outcome measures given the pre-post nature of the study where study duration was not sufficient to observe meaningful change on these measures. Instead, this data was collected to pilot our evaluation methods for the next phase of our research (RCT).

**Qualitative Feedback**

To obtain qualitative feedback, at the end of each lesson students were asked to complete a brief measure rating how enjoyable and valuable they thought the lesson was on a scale of 1 (Not At All) to 4 (Very), what they had learned and if they had any suggestions for improvements to the program.

**Risk Factors**

**Shape and Weight Concern**

The shape concern (7-item) and weight concern (6-item) scales from the Eating Disorder Examination – Questionnaire (Fairburn & Beglin, 1994) were combined to provide a single measure (12-items) of these constructs. Participants responded to items (e.g., “Have you had a strong desire to lose weight?”) on 7-point Likert scales ranging
between 0 (*not at all*) and 6 (*marked*), and thus higher scores reflect greater levels of concern. Fairburn and Beglin found scores on both the shape concern \((r = .80)\) and weight concern \((r = .79)\) subscales to correlate highly with the scores on the Eating Disorder Examination, which is considered the ‘gold standard’ measure of disordered eating. Wade and Lowes (2002) reported high internal reliability for the shape concern \((\alpha = .85)\) and weight concern \((\alpha = .92)\) subscales in an adolescent population, while the combined scales were highly reliable in the current study (girls \(\alpha = .95\); boys \(\alpha = .95\)).

**Dieting**

The 10-item Dutch Eating Behavior Questionnaire – Restraint scale (Van Strien, Frijters, Bergers & Defares, 1986) assessed participants’ intentions to restrict food intake for weight reasons (e.g., “*When you put on weight do you eat less than you usually do?*”) where responses range from 1 (*never*) to 5 (*often*). Mean item scores were used where higher scores indicated higher levels of dietary restraint. The internal consistency and test-retest reliability of the DEBQ-R has previously been shown to be acceptable for use with Australian young adolescent girls (Tilgner, Wertheim & Paxton, 2004) and was highly reliable in the current study (girls \(\alpha = .94\); boys \(\alpha = .91\)).

**Body Dissatisfaction**

The 9-item Eating Disorder Inventory – Body Dissatisfaction scale (EDI-BD: Garner, Olmstead & Polivy, 1983) was used to assess the degree of satisfaction with various parts of the body. Responses range from 1 (*never*) to 6 (*always*), with 5 items reversed scored due to being worded in a positive direction (e.g., “I think my stomach is just the right size”). The continuous scoring used was different to that prescribed by the manual which is recommended for use with clinical populations (i.e., the 3 most extreme disordered responses are scored 3, 2 and 1 respectively, with the remaining responses scored 0). The reason for this difference was a desire to measure the full variation of
body dissatisfaction in a non-clinical sample, and this approach has been used in other Australian studies (e.g., Tilgner et al., 2004). The measure is widely used in eating disorder research and has been found to be reliable and valid measure for 11-18-year-old participants (Shore & Porter, 1990).

An adapted measure of the EDI-BD was used with male participants, based on adaptations made by Hallsworth, Wade and Tiggemann (2005). These changes included reversing the direction of some items (e.g., “too big/large” changed to “too small”), and making body part references male appropriate by adding items relating to chest and bicep size, and omitting items relating to hip size. Internal reliability for the respective measures in the present study was also good for both girls ($\alpha = 0.90$) and boys ($\alpha = 0.83$).

**Media Internalization**

The 9-item Internalization – General Scale from the 30-item Sociocultural Attitudes Towards Appearance Questionnaire-3 (Thompson, van den Berg, Roehrig, Guarda & Heinberg, 2004) was used to measure levels of internalization of culturally ideal body types presented in the media (e.g., “I compare my body to the bodies of TV and movie stars”). Participants rated their responses on 5-point Likert Scales ranging from 1 (definitely disagree) to 5 (definitely agree), with higher scores indicating a higher level of internalization. A recent Australian validation study (Wilksch & Wade, 2012) supports the reliable use of this scale with young-adolescent girls and boys and the scale was again reliable in the current study (girls $\alpha = .94$; boys $\alpha = .96$).

**Depression**

The 10-item Children’s Depression Inventory – Short Form (Kovacs, 1992) measures a range of depressive symptoms, including disturbed mood, vegetative functions, and interpersonal behaviours, and was used to measure depression in the current study. For each item, participants select one of three options on a 3-point Likert
scale (e.g., 0 [I am sad once in a while], 1 [I am sad many times], 2 [I am sad all the

time]), with higher scores indicating a higher level of depression. The CDI has

reliably used with early adolescent Australian samples (Roberts, Kane, Thomson, Bishop

& Hart, 2003), and internal reliability was again adequate for the current study (girls $\alpha =

.83; \text{ boys } \alpha = .82)$.

**Concern Over Mistakes**

The nine-item Concern over Mistakes scale from the Multidimensional

Perfectionism Scale (Frost, Marten, Lahart & Rosenblate, 1990) was used to assess the

extent to which an individual has excessive fears about making mistakes, and attributing

such mistakes personally (e.g., “If I fail at work/study, I am a failure as a person.”).

Participants respond on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5

(Strongly Agree). This scale has been used extensively, including with an Australian

adolescent population (Wade & Lowes, 2002), where it was found to have acceptable

reliability ($\alpha = .85$), while internal consistency was high in the current study (girls $\alpha =

.92; \text{ boys } \alpha = .89$).

**Peer Teasing**

The relevant 8-items from the McKnight Risk Factor Survey (McKnight

Investigators, 2003) were used to assess peer teasing. Participants respond to questions

(e.g., In the past year, how often have girls/young women (including sisters) made fun of

you because of your weight?), on Likert scales ranging from 1 (Never) to 5 (Always),

where higher scores indicate higher levels of teasing. The McKnight Risk Factor Survey

(2003) underwent a thorough development and validation process leading to high levels

of internal reliability, test-retest reliability and convergent validity, while internal

reliability was high in the current study (girls $\alpha = .94; \text{ boys } \alpha = .93$).

**Eating Habits**
Three items from the Project Eating Among Teens (EAT-II: Haines et al., 2006) survey were included to assess frequency of eating regular meals. Participants responded to questions (e.g., “during the past week, how many days did you eat lunch?”) with responses ranging from 1 (Never) to 5 (Always), where higher scores were desirable and indicated more regular eating of meals. The Project EAT survey is a comprehensive measure that has undergone revisions and has informed numerous risk factor studies (e.g., Haines et al., 2007; Neumark-Sztainer et al., 2007).

**Screen Time**

A further 4 items from the EAT-II (Haines et al., 2006) were used to assess screen time relating to television/DVD and Internet/computer use (not for school work), averaged across weekdays and weekends. Participants respond to items such as “In your free time on an average weekday (Monday-Friday), how many hours do you spend watching TV and DVDs?” range from 0 (0 hours) to 6 (5+ hours per day).

**Physical Activity**

Six items relating to average time spent playing outside, competitive sport and bike riding on weekdays and weekends from the GUTS (Field et al., 2003) were included to assess levels of physical activity. Participants responded to items (e.g., On the weekend, how many hours do you usually spend playing outside?”) on a Likert Scale of 1 (0-1 hour) to 3 (4-6 hours), where higher scores indicate higher levels of physical activity. The measure has been found to have adequate test-retest reliability and be moderately associated with cardiorespiratory fitness (Berkey et al., 2000).

**Results**

**Student Feedback**

For the whole *Life Smart* sample, no significant differences emerged regarding perceived value of each lesson, while Lesson 2 (healthy eating) was rated as significantly
more enjoyable than other lessons apart from Lessons 7 and 8 (small group presentations and reviewing program content), \(F(6, 265)=6.69, p<.001; ES = .32\]. Gender differences emerged for two lessons, with boys \((M = 3.07; SD=0.59)\) rating Lesson 2 (eating) as significantly more valuable than girls \((M = 2.56; SD=0.73)\), \(t(29) = -2.12, p = .043\], while girls \((M = 2.94; SD=0.66)\) rated Lesson 3 (exercise and sleep) as significantly more valuable than boys \((M = 2.46; SD=0.72)\), \(t(39) = 2.22, p <.033\]. Qualitative descriptions of favourite learning activities clearly favoured interactive components of the program such as role-plays and class discussions. While few students recorded suggestions for how to improve a lesson, the most common suggestions were to further increase interactive activities.

**Baseline Measures**

Independent sample t-tests revealed no significant differences between baseline risk factor scores for girls in the *Life Smart* and control conditions and boys in the *Life Smart* and Control conditions. Mean total scale scores are presented in **Table 2** where it can be seen that the majority of scores were in the mid-range, and participants reported eating regular meals. Responses on screen time reflected an average of 2-3 hours viewing per day, while physical activity scores were averaging 1-2 hours per day. An investigation of the distribution of participants with clinically significant shape and weight concern (total score ≥44) revealed 5% of the overall sample met this clinical indicator (girls: *Life Smart* \(N = 1\); control \(N = 4\); boys: *Life Smart* \(N = 1\); control \(N = 0\)).

**Repeated Measures for Risk Factors**

Prior to outcome analyses, data for all variables were inspected for missing values, normality and outliers. Eleven scales required square root or log transformations, as they were significantly positively skewed and these scales are identified in **Table 3**.
Analyses of covariance (ANCOVAs) were conducted to assess the efficacy of Life Smart with baseline observations entered as a covariate to ensure that any effects were due to changes at post-program and not due to variation in scores at baseline or measurement error. This involved a 2 (group: Life Smart, control) X 2 (gender: girls, boys) design. This approach allows for direct comparisons between the Life Smart and control groups at post-program by accounting for variance across conditions at baseline. The alpha level for testing for main effects and interactions remained at .05. A priori Bonferroni-adjusted pairwise comparisons were conducted, while Cohen’s $d$ was calculated for significant interactions, main effects and between-groups post-hoc comparisons ($d = \sqrt[2]{F}/\sqrt{df(error)}$), where .2 = small, .5 = moderate, .8 = large.

Adjusted mean total post-program scores and covariate values by group and gender are presented in Table 3. Although presented separately, these analyses were conducted simultaneously and not repeated by gender. A significant main effect for group of moderate effect size was found for shape and weight concern [$F(1,56)=4.071$, $p=.048$; ES = .54], where Life Smart participants ($M=17.04$, $SE=2.16$) scored significantly lower at post-program compared to controls ($M=22.32$, $SE=1.44$). Table 3 presents pairwise comparisons where it can be seen that this finding was primarily due to improvements in scores for Life Smart girls (ES=.78) rather than boys. While this was the only variable to have a significant main effect for group, post-hoc testing revealed differences of a medium effect size for girls on body dissatisfaction, peer-teasing and media internalization. Table 3 reveals Life Smart girls were scoring significantly lower than control girls on these measures at post-program. No significant differences emerged on any weight gain risk factors for either girls or boys. However, Life Smart boys did experience an increase in physical activity of small-moderate effect (ES=.37).

Discussion
This study involved a pilot evaluation of Life Smart, a new school-based program to simultaneously reduce risk factors for both eating disorder and obesity risk factors and represented the first phase of a larger research program. With respect to the first aim, ratings of student enjoyment and perceived value were generally positive. Our previous research has indicated that favourable participant ratings of program enjoyment and value co-occur with a beneficial impact on risk factors (Wilksch et al., 2006; Wilksch & Wade, 2009). The importance of interactive, student-centred learning activities has been previously described (Stice et al., 2007) and in the current study students again rated engaging in group work activities as the most enjoyed components of the program.

It was of interest that the lesson focusing on healthy eating was rated as one of the most enjoyable lessons in the program, particularly so for boys. In developing this lesson, we sought to keep content as clear possible since it seems healthy eating is an area where young people regularly hear many and possibly conflicting messages. Conversely, girls enjoyed the sleep and exercise lesson more than boys. The main learning activity in the healthy eating lesson was small group work on a presentation to share with the class while the sleep and exercise lesson predominantly involved a PowerPoint presentation. It is possible that girls found the information about sleep and exercise more relevant to them as they might already have been familiar with messages about healthy eating.

Taken collectively, the feedback indicated that the students did consider the program worthwhile and many reported the take home messages to be useful. In regard to suggested areas of improvement, it seems making some lessons even more interactive, less writing, and more class discussion, would improve student’s perceptions of the program. These considerations have informed improvements to the program and the development of an accompanying student workbook for an RCT involving Life Smart.
With respect to the second aim, the only significant between-group difference found was for shape and weight concern, with post-hoc testing finding girls experienced a reduction of large effect due to participating in Life Smart. Shape and weight concern is one of the most proximal and strongest risk factors for eating disorders and disordered eating (McKnight Investigators, 2003) and the effect size found for girls at post-program compares favourably with the same stage of our previously successful eating disorder prevention program Media Smart (Wilksch & Wade, 2009). Given this previous trial found an increase in effect size as time went on over the 2.5-year follow-up, the post-program shape and weight concern result for Life Smart in the current trial can be taken as encouraging.

Life Smart girls also experienced benefits of moderate effect size for body dissatisfaction, peer-teasing and media internalization. These findings were positive given their risk to both disordered eating (Stice, 2002) and weight gain (Stice et al., 2005; Neumark-Sztainer et al., 2007). Boys who participated in Life Smart experienced no significant benefits, with their post-program scores generally being very similar to the control group. The one notable improvement for boys was for physical activity. The general lack of significant effects for group was expected since programs with universal, mixed-gender, young-adolescent audiences are generally seeking a prevention rather than treatment effect, where a halt in growth of risk factor over time is the sought goal and where the time frame of this study was too short to adequately measure such a possible effect. This is particularly the case in universal samples with generally low baseline risk of disordered eating or obesity.

Given the main purpose of the current study was to develop and pilot Life Smart focussing particularly on students’ perceived value and enjoyment of the program, some components of more rigorous quantitative research were lacking. Specifically, the
absence of follow-up measurement, the small sample size, the sole inclusion of private
school participants limiting the generalizability of results, the absence of data on
participant ethnicity and socioeconomic status, the sole use of self-report rather than
clinical interviews, and the absence of measurement of some Life Smart risk factor targets
(e.g., sleep duration) and disordered eating behaviours (particularly binge eating given its
relevance to both weight gain and disordered eating (Field et al., 2003)) were all
limitations. Further, whilst a control group was included, these participants attended their
usual school classes taught by their usual class teachers and as such, non-specific effects
cannot be ruled out for the findings in the intervention condition. Finally, while it is
considered methodologically rigorous to have both intervention and control participants
from the same school (Pratt & Woolfenden, 2002), it is acknowledged that this does risk
contamination effects (e.g., conversation between peers from different classes), though it
should also be acknowledged that this is likely to reduce rather than inflate differences
between intervention and control participants.

Overall, given the generally positive feedback and some evidence of benefit on
important risk factors, the current study provides support for a thorough evaluation of
Life Smart and we are currently investigating its efficacy in a large RCT in comparison to
two other prevention programs. As is the case for universal prevention trials with young-
adolescent samples, follow-up evaluations will be central to determining the programs’
efficacy.
References


Table 1.

Overview of the Life Smart lessons

<table>
<thead>
<tr>
<th>Lessons/ Main Topics</th>
<th>Example Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Health: There’s more to it than you might think!</td>
<td>• Examine magazines for advertisements that stereotype men and women</td>
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<td></td>
<td>• Introduction to Life Smart pie chart: Physical, mind and social health</td>
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<tr>
<td>2. Physical health: Fuelling our health</td>
<td>• Dispelling the myths: 4 healthy eating tips</td>
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<td></td>
<td>• Small group presentations aimed at convincing young people to follow the healthy eating tip</td>
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<td>3. Physical health: Adding rest and play to our health</td>
<td>• Class discussion: What messages do we get about sleep and exercise?</td>
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<td></td>
<td>• PowerPoint: Tips for healthy sleep and exercise</td>
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<td></td>
<td>• Small group: Helping a friend struggling to get enough sleep or exercise</td>
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<td>4. Healthy thinking!</td>
<td>• Identifying unhelpful thinking styles: class discussion and DVD clip</td>
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<td></td>
<td>• Role-plays: how would you help someone younger than you to follow tips for healthy thinking</td>
</tr>
<tr>
<td>5. Emotions: What do they do for us and how can we handle them?</td>
<td>• Class discussion: What are emotions and what role do they play?</td>
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<td></td>
<td>• Small group: What can we do with strong emotions?</td>
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<tr>
<td></td>
<td>• Pie chart: How do our emotions affect the other parts of health?</td>
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<tr>
<td>6. Family &amp; friends: How do they affect our health?</td>
<td>• Class discussion: What are the qualities of friends and safe people?</td>
</tr>
<tr>
<td></td>
<td>• Small group: Making connections with safe people</td>
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<tr>
<td>7. How to be life smart: What do you think?</td>
<td>• Small group preparation for a presentation in lesson 8 addressing one of the following: “If someone is overweight, they are unhealthy – agree or disagree?” or “Looking after your health means…”</td>
</tr>
<tr>
<td>8. Where to from here? Looking to the future</td>
<td>• Small groups deliver presentations</td>
</tr>
<tr>
<td></td>
<td>• Class discussion: the choices we have and program review</td>
</tr>
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### Table 2

**Baseline means (and standard deviations) by gender (2) and group (2)**

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<thead>
<tr>
<th></th>
<th>Range</th>
<th>Girls</th>
<th></th>
<th></th>
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<th>Boys</th>
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</thead>
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<tr>
<td></td>
<td></td>
<td>Life Smart</td>
<td>Control</td>
<td>Life Smart</td>
<td>Control</td>
<td></td>
<td>Life Smart</td>
<td>Control</td>
</tr>
<tr>
<td>- Shape &amp; weight concern</td>
<td>0-72</td>
<td>26.75 (15.24)</td>
<td>31.04 (17.28)</td>
<td>16.70 (18.53)</td>
<td>19.40 (17.32)</td>
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<tr>
<td>- Dieting</td>
<td>10-50</td>
<td>20.00 (8.73)</td>
<td>24.08 (8.95)</td>
<td>16.35 (7.79)</td>
<td>17.68 (6.83)</td>
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<td>- Body dissatisfaction</td>
<td>9-54</td>
<td>28.15 (4.12)</td>
<td>28.87 (3.59)</td>
<td>33.20 (7.12)</td>
<td>33.47 (6.33)</td>
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<tr>
<td>- Depression</td>
<td>0-20</td>
<td>9.58 (1.16)</td>
<td>10.00 (1.00)</td>
<td>9.78 (1.19)</td>
<td>9.96 (1.08)</td>
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<tr>
<td>- Media internalisation</td>
<td>9-45</td>
<td>23.38 (8.60)</td>
<td>25.56 (9.21)</td>
<td>20.75 (9.15)</td>
<td>21.69 (8.84)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Concern over mistakes</td>
<td>9-45</td>
<td>18.17 (6.44)</td>
<td>20.12 (7.20)</td>
<td>17.31 (7.74)</td>
<td>17.83 (5.87)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Teasing</td>
<td>8-40</td>
<td>15.39 (8.08)</td>
<td>14.88 (7.30)</td>
<td>11.68 (5.49)</td>
<td>11.57 (5.37)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Regular meals</td>
<td>1-5</td>
<td>4.56 (0.42)</td>
<td>4.49 (0.54)</td>
<td>4.76 (0.64)</td>
<td>4.88 (0.28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Screen time</td>
<td>1-7</td>
<td>3.50 (0.98)</td>
<td>3.51 (0.81)</td>
<td>3.94 (1.34)</td>
<td>3.92 (1.00)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Physical activity</td>
<td>1-3</td>
<td>1.67 (0.54)</td>
<td>1.44 (0.34)</td>
<td>1.96 (0.35)</td>
<td>1.97 (0.40)</td>
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</tr>
</tbody>
</table>
Table 3.

**ANCOVA for risk factors by group (2) and gender (2).**

<table>
<thead>
<tr>
<th>Measures</th>
<th>Baseline</th>
<th></th>
<th>Post-Program</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Girls</td>
<td></td>
<td>Boys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LS</td>
<td>Control</td>
<td>ES</td>
<td>LS</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M (SE)</td>
<td>M (SE)</td>
<td>d</td>
<td>M (SE)</td>
<td>M (SE)</td>
</tr>
<tr>
<td><em>Shape &amp; weight concern</em>²</td>
<td>24.84</td>
<td>14.04 (3.12)</td>
<td>25.32 (2.40)</td>
<td>.78*</td>
<td>20.16 (2.88)</td>
<td>19.32 (1.92)</td>
</tr>
<tr>
<td><em>Dieting</em>³</td>
<td>20.18</td>
<td>17.33 (1.49)</td>
<td>19.82 (1.11)</td>
<td>.35</td>
<td>19.10 (1.25)</td>
<td>18.68 (0.92)</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>24.39</td>
<td>19.98 (2.07)</td>
<td>25.65 (1.62)</td>
<td>.57*</td>
<td>24.03 (1.8)</td>
<td>23.49 (1.35)</td>
</tr>
<tr>
<td>Depression*²</td>
<td>9.88</td>
<td>9.23 (0.47)</td>
<td>9.72 (0.33)</td>
<td>.26</td>
<td>10.16 (0.43)</td>
<td>9.72 (0.29)</td>
</tr>
<tr>
<td>Media internalisation</td>
<td>22.59</td>
<td>18.45 (2.16)</td>
<td>23.13 (1.62)</td>
<td>.44</td>
<td>22.50 (2.61)</td>
<td>23.31 (1.35)</td>
</tr>
<tr>
<td>Concern over mistakes*²</td>
<td>18.20</td>
<td>17.73 (1.77)</td>
<td>18.05 (1.25)</td>
<td>.10</td>
<td>17.00 (1.47)</td>
<td>17.06 (1.04)</td>
</tr>
<tr>
<td>Teasing*³</td>
<td>13.51</td>
<td>9.56 (1.21)</td>
<td>12.90 (.93)</td>
<td>.63*</td>
<td>13.82 (1.06)</td>
<td>12.52 (.79)</td>
</tr>
<tr>
<td>Regular meals²</td>
<td>4.74</td>
<td>4.79 (.91)</td>
<td>4.64 (.70)</td>
<td>.20</td>
<td>4.45 (.83)</td>
<td>4.69 (.61)</td>
</tr>
</tbody>
</table>
The effect of the baseline value has been statistically removed to allow for direct comparisons across Life Smart and Control groups at post-program. A significant main effect for group. Cohen’s $d$ is for Bonferroni-adjusted post-hoc testing of between-groups’ difference by gender at post-program. ES = Effect size; LS = Life Smart; M = adjusted estimated marginal mean; SE = standard error; $\pm$ = While raw scores are presented, transformed scores were used for repeated measures analyses as scores were significantly positively skewed. Tests of significant pairwise comparisons between same-gender students in different groups: * $p<.05$, ** $p<.01$. Lower scores indicate lower risk on all variables except: regular meals, screen time and physical activity.

<table>
<thead>
<tr>
<th></th>
<th>LS</th>
<th>LS</th>
<th>LS</th>
<th>LS</th>
<th>LS</th>
<th>LS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Screen time$\pm$</td>
<td>3.75</td>
<td>3.90 (.12)</td>
<td>3.81 (.06)</td>
<td>.22</td>
<td>3.81 (.09)</td>
<td>3.78 (.06)</td>
</tr>
<tr>
<td>- Physical activity$\pm$</td>
<td>1.72</td>
<td>1.55 (.12)</td>
<td>1.58 (.82)</td>
<td>.07</td>
<td>1.82 (.11)</td>
<td>1.62 (.07)</td>
</tr>
</tbody>
</table>

Notes. The effect of the baseline value has been statistically removed to allow for direct comparisons across Life Smart and Control groups at post-program. $^a$ = significant main effect for group. Cohen’s $d$ is for Bonferroni-adjusted post-hoc testing of between-groups’ difference by gender at post-program. ES = Effect size; LS = Life Smart; M = adjusted estimated marginal mean; SE = standard error; $^\pm$ = While raw scores are presented, transformed scores were used for repeated measures analyses as scores were significantly positively skewed. Tests of significant pairwise comparisons between same-gender students in different groups: * $p<.05$, ** $p<.01$. Lower scores indicate lower risk on all variables except: regular meals, screen time and physical activity.