**A cluster randomized controlled trial of the SoMe social media literacy body image and wellbeing program for adolescent boys and girls: Study protocol**

**Abstract**

Youth spend substantial time on social media, which can foster self-critical processes that increase risk of body dissatisfaction, disordered eating, and depressed mood. To date, there have been few investigations of interventions to decrease the negative impacts of social media engagement in adolescent boys and girls. This paper outlines the protocol for a cluster randomized controlled trial (RCT) of a four-lesson social media literacy program that was developed based on pilot results and aims to decrease body dissatisfaction, dietary restraint, and strategies to increase muscles. The RCT will be conducted with grades 7-8 students from Australian secondary schools. Using block randomization, grade levels within schools will be assigned to either the SoMe program (intervention) or health lessons as usual (control). Primary outcomes will be body satisfaction, dietary restraint, and strategies to increase muscles. Secondary outcomes will be self-esteem and depressed mood. Participants will complete assessments on four occasions – baseline, five-weeks post-baseline, and six- and 12-month post-baseline. Analyses will compare outcomes in the intervention compared to the control group. This study will be the first to implement a RCT design to evaluate the impact of a school-based social media literacy program designed to mitigate negative impacts of social media.

 *Keywords:*Body image; social media; RCT-protocol; Adolescents; Eating disorders; Prevention

1. **Introduction**

Body dissatisfaction is recognized as a public health issue in the Western world (Bucchianeri & Neumark-Sztainer, 2014), and affects high numbers of adolescent girls and boys (Carlisle et al., 2018; Micali, Ploubidis, De Stavola, Simonoff, & Treasure, 2014). This is concerning as body dissatisfaction is the primary risk factor for disordered eating, including unhealthy dieting, binge eating, and muscle building behaviors (Goldschmidt, Wall, Loth, & Neumark-Sztainer, 2015; Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006; Pope, Kanayama, & Hudson, 2011), and the development of clinical eating disorders (Stice, Marti, & Durant, 2011), as well as being associated with a range of other negative consequences. To date, successful prevention approaches have focused on targeting social pressures to achieve unrealistic appearance ideals (McLean, Paxton, & Wertheim, 2013a; Rohde et al., 2014). In recent years, increasing evidence has emerged for the role of social media as a new contributor to appearance pressures. Yet, to date, prevention efforts have been slow to target social media, and include relevant content. The present study aims to fill this gap and evaluate a social media literacy intervention designed to decrease body dissatisfaction, dietary restraint, and strategies to increase muscles.

The dominant approach to public health-level prevention is to utilize an aetiological model in which causal risk factors are reduced with the goal of interrupting the development of the health problem (Paxton, 2012). Risk factors for the development of body dissatisfaction include biological factors (e.g., genetic factors), individual temperament, and sociocultural appearance pressures particularly from family, peers, and media (Rodgers, Paxton, & McLean, 2014; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). According to one major sociocultural theory, the tripartite influence model (Thompson et al., 1999), there are two known cognitive processes that mediate the influence of these pressures on body dissatisfaction: internalization of societal appearance ideals (i.e., subscribing to and aspiring to attain the thin ideal for females, and the lean, muscular ideal for males) and appearance comparison (i.e., the tendency to compare one’s appearance with that of another; Keery, Van Den Berg, & Thompson, 2004). As appearance ideals are unrealistic and unattainable for most, and appearance comparisons with others, including on social media, tend to be made with targets judged to be more attractive than the individual (upward comparison; Fardouly, Pinkus, & Vartanian, 2017), body dissatisfaction likely follows (Jones, 2004). Examination of the tripartite influence model among adolescents has provided empirical support for proposed relationships in both girls and boys (Amaral & Ferreira, 2017; Papp, Urban, Czegledi, Babusa, & Tury, 2013; Thompson et al., 2017). Pressures to conform to appearance ideals from peers and media have been a particular focus of interventions as these are more easily addressed in universal and selective prevention settings (Stice, Shaw, & Marti, 2007). Addressing family pressures, by comparison, may necessitate some family involvement and a greater level of sensitivity so that different parenting practices are respected (Gerards, et al., 2012).

Although theory and empirical research highlights the importance of media and peer environments in the development of body dissatisfaction, in recent years the nature of these environments has changed enormously with the advent of the Internet and, in particular, social media and social networking. Social media such as Instagram, which include the viewing, posting, and commenting on photos of self and others, is now part of daily life for most adolescents (Tsitsika et al., 2014). In Australia, ninety-nine percent of teenagers between the ages of 15 and 17 use the Internet, reaching 18 hours a week usage (ABS, 2018).

Use of social media is distinct from traditional media use as young people are not primarily passive consumers but, rather, create and share content that co-exists with commercially generated content (Perloff, 2014). The potential for peer interaction is extremely high and social media also facilitate self-disclosure and control of self-presentation, especially with visual tools such as photos and videos (Perloff, 2014; Trekels, Ward, & Eggermont, 2018) in which appearance is often the central focus (Frisén, Berne, & Lunde, 2013; Zheng, Ni, & Luo, 2019). Consistent with this, research highlights the very high levels of exposure to idealized appearance images in Internet and social networking environments (Rodgers & Melioli, 2016; Slater, Tiggemann, Hawkins, & Werchon, 2012). Qualitative research confirms that many girls carefully curate and edit self-images (selfies) to meet standards of beauty endorsed by peers and believe the dynamics of social media increase the intensity of peer appearance comparison processes (Chua & Chang, 2016).

Not surprisingly then, greater involvement in social networking sites, especially those which mainly involve posting and viewing photographs of self and others, have been shown to be damaging to body image, mood, and self-esteem (Kelly, Zilanawala, Booker, & Sacker, 2018). Higher social media use has been associated with greater internalization of appearance ideals and appearance comparisons tendencies, and greater body dissatisfaction (de Vries & Kühne, 2015; Sampasa-Kanyinga, Chaput, & Hamilton, 2016; Tiggemann & Slater, 2014), and this is especially the case among those with greater investment in photo-posting and manipulation (McLean, Paxton, Wertheim, & Masters, 2015). Further, there is a positive association between social media use, especially appearance-related features, and internalization of the thin ideal (Mingoia et al. 2017), poor well-being and body confidence (McLean et al., 2019), body dissatisfaction, and eating concerns (Holland & Tiggemann, 2016).

Supporting a causal relationship between social media use and negative body image, longitudinal research with adolescents by de Vries, Peter, de Graaf, and Nikken (2016) found social network use predicted an increase in body dissatisfaction one year later. In addition, maladaptive use of social media (defined as tendency to seek negative social evaluations and/or engage in social comparisons) has been shown to predict increases in body dissatisfaction and bulimic symptoms in young adult females (Smith, Hames, & Joiner Jr, 2013). Taken together, the extant research suggests social media use, especially of photo-based activities, increases risk of body dissatisfaction and disordered eating in adolescents and young adults, most likely mediated by internalization of appearance ideals and appearance comparisons. In view of these findings, contemporary prevention efforts grounded in sociocultural approaches that aim to prevent body image concerns and related risk factors by decreasing the pursuit of unattainable appearance ideals may fail to address relevant sources of pressure if they do not explicitly address social media as a key source of pressure. However, to date, little attention has been paid to social media in prevention interventions, particularly those designed for adolescents, thus creating a critical gap in available resources.

One factor that mitigates the negative influence of exposure to images of idealized women and men in traditional media (e.g., magazines, television) is media literacy (McLean, Paxton, & Wertheim, 2016a). Traditional media literacy in relation to appearance-focused media has concentrated on the ability to critically analyze idealized images presented in media and to understand the motives of advertisers (McLean et al., 2016a; Wilksch & Wade, 2015). In theory, actively responding to media images with critical understanding and analysis has the effect of decreasing the degree to which media exposure contributes to body dissatisfaction, as images will be perceived as inappropriate targets for appearance comparisons and less acceptable as standards of beauty to be internalized (McLean, Paxton, & Wertheim, 2013; Wilksch & Wade, 2015).

Building on concepts of traditional media literacy, we propose that an intervention that raises awareness of selective and unrealistic presentations on social media, and commercial and personal motives for social media postings, would help protect against the negative impact of social media use on body image. In addition, as described above, one of the characteristics that differentiates social media from traditional media use is the active rather than passive nature of social media engagement. One of the specific aspects of social media engagement that has been shown to be particularly relevant to body image is investment in photo-related activities, and the curating and posting of images and selfies (McLean et al., 2015; McLean et al., 2019). Therefore, another focus of the intervention is to modify the ways in which adolescents engage with social media. A pilot study of a brief (three lesson) classroom-based social media literacy intervention with 90 early adolescent girls provided strong support for this concept. The three 50-minute interactive lessons addressed the influential and targeted nature of advertising on social media, digital manipulation of images on social media, and appearance comparisons with social media images. The intervention sought to reduce the focus on and importance of appearance in social media interactions. From pre- to post-test, participants in the intervention group (*n* = 60) demonstrated improvements in body image, dietary restraint, and media literacy relative to the control group (*n* = 30) who attended classes as usual (McLean, Wertheim, Masters, & Paxton, 2017). Although the pilot data are encouraging, further methodologically strong research is required to identify benefits or otherwise of a school-based social media literacy program.

**1.1. Study Aims**

The aim of this paper is to describe the protocol for a novel study of a four-session classroom social media literacy intervention (*SoMe: A social media literacy body image and well-being program for early high school students*). The study will test whether the intervention can mitigate the negative impacts of social media engagement on body dissatisfaction, dietary restraint, and strategies to increase muscles, as well as self-esteem and depressed mood. The intervention condition will be compared to a no-intervention control group in grade 7 and 8 girls and boys, in the context of a fully-powered randomized controlled trial. This age group was chosen as it is prior to the major onset of body image and eating concerns (Wang et al., 2019). Social media literacy intervention is a new field in prevention of physical or mental health problems. Apart from the pilot study described above (McLean et al., 2017), we are only aware of one other published social media literacy intervention. In this study, positive attitudes towards tanning in young adults were reduced by increasing critical awareness of manipulation of skin tone on social media and pressures to conform to social media (Mingoia, Hutchinson, Gleaves, & Wilson, 2019). Our study differs from Mingoia et al.,’s (2019) study, as it focusses on adolescents and addresses body dissatisfaction.Thus, our study is innovative and addresses a crucial contemporary source of appearance pressure in a classroom setting.

We selected to conduct a classroom-based intervention rather than an internet-delivered intervention as used in other health-related fields such as drug and alcohol (Champion, Newton, Barrett, & Teesson, 2013), for a number of reasons. In addition to being able to reach a large number of young people at a developmentally appropriate age in a convenient setting (Yager, Diedrichs, Ricciardelli, & Halliwell, 2013; Yager & O’Dea, 2015), social media is a potent appearance-focused peer environment (Rodgers, 2016); therefore, discussing its impact in a classroom peer environment is highly relevant and not only potentially facilitates individual change but also change in the peer culture in the classroom (Yager & O’Dea, 2015).

The intervention has been designed to be delivered to boys as well as girls due to increasing recognition of body image and eating concerns amongst boys (Mitchison, Mond, Slewa‐Younan, & Hay, 2013; Murray, Griffiths, & Nagata, 2018; Wilksch & Wade, 2009). In addition, there is a considerable overlap in risk factors for these problems in girls and boys (e.g., Helfert & Warschburger, 2011), and boys and girls have been shown to be affected by social media in a similar way (Holland & Tiggemann, 2016). Further, boys make up an important part of the peer environment for girls, and vice versa, in co-educational school settings, so understanding the perspective of the other gender is likely to be beneficial (Dunstan, Paxton, & McLean, 2017). The pilot program was adapted to be relevant to boys through the inclusion of social media examples that are popular among boys, deconstruction of images focused on the muscular ideal, and inclusion of a male activist that has sought to change the social media landscape. There was also a need to increase the number of lessons from three to four in order to expand content to be suitable for both boys and girls.Further, the reductions across different risk factors obtained in the pilot study supported keeping the main focus on social media.

At this early stage in the evaluation of SoMe, we decided on researcher-led rather than teacher-led delivery, as use of trained study personnel was the best way to ensure fidelity to the program, an important aspect of an initial efficacy trial. However, SoMe was manualized to facilitate rapid dissemination amongst teachers at the conclusion of the research, if warranted. All personnel who will deliver the intervention will receive training along with the structured teaching manual to reduce possible difference in outcomes due to different personnel delivering the intervention.

We hypothesize that participants receiving SoMe will report decreased body dissatisfaction, dietary restraint, and strategies to increase muscles (primary outcome variables). They will also report elevated self-esteem and reduced depressed mood (secondary outcomes) from baseline to immediate posttest, and from baseline to six and 12 months compared to the no-intervention control group. We also hypothesize that changes in internalization of media appearance ideals, appearance comparison, social media engagement, and social media motivations and literacy will mediate the effects of the intervention.

**2. Method**

**2.1. Ethics Approval and Trial Registration**

This study received ethics approval from La Trobe University (HEC17-020) and the Victorian Department of Education and Training (2017\_003388). Active informed consent from parents and assent from adolescents will be sought prior to their enrollment in the study. The study is registered with the Australian New Zealand Clinical Trials Registry (ACTRN12617000137392; [www.anzctr.org.au](http://www.anzctr.org.au)).

**2.2. Research Design**

This study is a two-arm cluster randomized controlled trial (Puffer, Torgerson, & Watson, 2005) with equal allocation to intervention and control conditions. Participants in the intervention group will receive the four-lesson SoMe program whilst participants in the control group will receive lessons as usual. The four lessons will be delivered over a four-week period, to allow the students adequate time to reflect on the lesson content. Data will be collected at baseline (pre-intervention), five-weeks post-baseline (immediately post-intervention), six months after baseline, and 12 months after baseline.

**2.3. Measures**

**2.3.1.****Demographic information.** Demographic questions will be included in the questionnaire, including school name, grade level, gender, country of birth, parents’ country of birth, main language spoken at home, whether they are Aboriginal or Torres Strait Islander, postcode, and height and weight.

**2.3.2. Primary outcome measures**. Weight and Shape Concern Subscales (12 items)

of the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Berglin, 1994) will be used to measure body dissatisfaction (Kling et al., 2019). Participants will indicate how often the statements (e.g., “Have you had a strong desire to lose weight?”) apply to them on a seven-point scale (0 = *not at all* and 6 = *markedly*).A mean score will be calculated where higher scores represent greater trait body dissatisfaction. This scale has been used with a sample of grade 7 boys and girls and found to have high internal consistency (girls α = 0.96; boys α = 0.91; Wilksch, 2015).

Three 100-point visual analogue scales (VAS; Durkin & Paxton, 2002) will be used to assess state body satisfaction. Participants will use a 100-point slider (0 = *not at all* and 100 = *very much*),to rate how satisfied they feel with their body shape, weight, and size. A mean score from the three scales will be calculated, with higher scores representing higher state body satisfaction. This approach has been shown to have good convergent validity with the Eating Disorder Inventory Body Dissatisfaction Subscale in adolescents (*r* = -62; Durkin & Paxton, 2002).

In relation to eating concerns, we will assess dieting as this is the behavior most frequently associated with body dissatisfaction in girls (Stice, Marti, & Durant, 2011; Rodgers, McLean, Marques, Dunstan, & Paxton, 2016), and strategies to increase muscles as these are the behaviors most frequently associated with body dissatisfaction in boys (McCabe & Ricciardelli, 2003). The 10-item Restraint Subscale from the Dutch Eating Behavior Questionnaire (DEBQ; van Strien, Frijters, Bergers, & Defares, 1986) will be used to assess dietary restraint. Participants will indicate how often the statements (e.g., “Do you deliberately eat foods that are slimming?”) apply to them on a five-point scale (1 = *never* and 5 = *very often*). A mean score will be calculated where higher scores represent greater levels of dietary restraint. This scale has been shown to have good internal consistency, test-retest reliability, and criterion validity in adolescents (Wu, Cai, & Luo, 2017).

The five-item Strategies to Increase Muscle Size Subscale from the Body Change Inventory (BCI; Ricciardelli & McCabe, 2002) will be used to assess strategies to increase muscles. Participants will indicate how frequently the statements (e.g., “How often do you *think* about changing our level of exercise to increase the size of your muscles?”) apply to them on a five-point scale (1 = *never* and 5 = *always*). Potential total scores will range from six to 30, with higher scores indicating a greater tendency to use strategies to increase muscles. This measure has been shown to have good content validity, construct validity, internal consistency, and concurrent and discriminant validity in an adolescent sample (Ricciardelli & McCabe, 2002).

**2.3.3. Secondary outcomes measures.** In relation to mental health, we chose to assess depressive symptoms and self-esteem as these are the most widely used indicators of mental health in adolescents (Kelly et al., 2018).

The single-item Self-Esteem Scale (Robins, Hendin, & Trzesniewski, 2001), and three-items from the Rosenberg Self-esteem Scale (RSE; Rosenberg, 1965) will be used to assess self-esteem. Participants will indicate the extent to which they agree with each statement (e.g., “I feel I have a number of good qualities”) on a five-point scale (1 = *not very true of me* andto 5 = *very true of me*). The three-items from the RSE will be summed after reverse coding of the negatively worded item. Higher scores indicate higher levels of self-esteem. Items from the RSE will be included to validate the single-item measure for use with similar samples to reduce participant burden. The RSE has been found to have good reliability and validity in adolescent samples (Pechorro, Marôco, Poiares, & Vieira, 2011).

Nine items from the 10-item Centre for Epidemiological Studies Depression Scale Revised (CESDR-10; Haroz, Ybarra, & Eaton, 2014) will be used to assess depressive symptoms. One item, “I wished I were dead” will be omitted due to ethical concerns. Participants will indicate how frequently the statements (e.g., “I had trouble keeping my mind on what I was doing”) apply to them on a five-point scale (0 = *not at all or less than 1 day in the last week* and 4 = *nearly every day for 2 weeks*). Total scores can range from zero to 36, with higher scores suggesting greater severity of depressive symptoms. The CESDR-10 has been found to have excellent internal consistency when used with a mixed-gender adolescent sample (González-Forteza, Jiménez-Tapia, Ramos-Lira, & Wagner, 2008).

**2.3.4. Proposed mediator variables**. Five-items, adapted from the Internalization-General subscale of the Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004), will be used to assess internalization of social media ideals. Adaptations included removal of comparison items so as not to overlap with our specific measure of appearance comparison, and specific focus on social media for all five items (e.g., “I would like my body to look like people on social media”). Items will be measured on a five-point scale (1 = *definitely disagree* and 5 *= definitely agree)*. The mean for the items will be calculated after reverse coding of the two negatively worded items. The original scale has been shown to be a reliable in adolescent girls and boys (Wilksch & Wade, 2012) and a shortened scale has been shown to be reliable in girls (McLean et al., 2016a).

The five-item Internalization-Muscular/Athletic Subscale of the Sociocultural Attitudes Towards Appearance Scale-4 (SATAQ-4) will be used to assess internalization of muscular/athletic ideals (Schaefer, Harriger, Heinberg, Soderberg, & Thompson, 2017). Participants will respond to items (e.g., “It is important for me to look athletic”) on a five-point scale (1 *= definitely disagree* and 5 *= definitely agree*). The mean will be calculated, with higher scores indicating a greater tendency to desire a muscular/athletic figure. The scale has been shown to be reliable in adolescent girls and boys (Schaefer et al., 2017; Lunde 2013; Yamamiya et al., 2019).

Five-items from the Upward Physical Appearance Comparison Scale (UPACS; O’Brien et al., 2009) will be used for assessment. Participants will respond to items (e.g., “I tend to compare myself to people I think look better than me”) on a five-point scale (1 *= definitely disagree* and5 *= definitely agree*). The mean will be calculated, with higher scores indicating a greater tendency to engage in upward appearance comparison. This scale has been shown to be reliable in girls (McLean et al., 2016a).

Frequency of use of social networking services (SNSs) will be assessed with nine items (e.g., Facebook, Instagram, Snapchat) created for this research. Responses will be recorded on 5-point scales (1 = *never* and to 5 = *always*). The two-item measure of McLean et al. (2015) will be used to assess frequency of selfie-taking using a 9-item scale (1 = *never* and 9 = *more than twice a day*). The mean of the two items will be calculated with higher scores indicating higher frequency of taking photos of oneself. One-item, developed for use in this study, “Do you edit or add filters to photos of yourself (including selfies) that you post or share on social media to make yourself look better?” will be used to assess photo manipulation. Responses are rated on a five-point scale (1 = *never* and 5 = *always*). Two-items, also developed for use in this study, rated on a five-point scale (1 = *never* and 5 = *always*), will assess frequency of engaging in appearance comments on social media. A sample item is “On social media, I give and receive comments about body size, shape or muscles.” The mean of the two items will be calculated, with higher scores indicating a greater tendency towards engaging in appearance conversations.

As there is no appropriate existing measure of appearance-related motives for social media use, a new measure has been developed by our team for this purpose (Authors, under review). Participants will rate 15-items (e.g., “I use social media to learn how to improve how I look”) on a 5-point scale (1 = *never* and 5 = *always*) to assess reasons for social media use including for social connectedness, to maintain popularity, to gain appearance feedback, and to engage with their values and interests. The internal reliability of all scales is acceptable among both boys and girls, ranging from α = .78 to α = .95 (Authors, under review).

Social media literacy skills relating to commercial, peer, and celebrity social media will be assessed with a measure extending on an existing measure found to be reliable in adolescent girls, and young adult males and females (McLean, Paxton, & Wertheim, 2016b; Tamplin, McLean, & Paxton, 2018). Thirty-five items rated on a five-point scale (1 = *never* and 5 = *always*) will assess participant’s understanding of the intent and purposes of social media messaging (e.g., “I think about what media messages are trying to convince me to do”), representation and reality (e.g., “I think about how true or false messages are”), similarity skepticism (e.g., “I wonder if there is any point trying to match the unrealistic ideals shown in media messages”), and authors and audiences (e.g., “I think about the reasons behind celebrity’s posts”). Items will be summed to form a total score. Higher scores reflect greater frequency of critical thinking and higher levels of skepticism about the realism of social media content. Scale properties will be investigated.

**2.4. Recruitment**

Approximately 40 schools in Victoria, Australia will be invited to participate in the research, with the aim of recruiting a mix of both public and independent schools in areas of differing socio-economic status to ensure a diverse sample of participants. School principals will be sent a letter outlining the aims of the study and seeking their permission to conduct research with their students. When a principal agrees to their school’s participation, the researchers will liaise with a nominated staff member to organize involvement.

A total of 700 grade 7 and 8 students (11-15 years old) will be recruited. Grade 7 and grade 8 cohorts within each participating school will be randomly assigned to either the control or intervention group. Block randomization, by grade level, within school, will be used, such that one of the participating grade levels, grade 7 and 8, within each school, will be allocated to the intervention group, and the other to the control group.

Separate blocks will be used due to sequential recruitment of schools and likely differences in numbers of students within grade levels, between schools. In this manner, schools will be categorized as small, with four or less classes per grade level, or categorized as large, with greater than four classes per grade level. Separate blocks for randomization of small and large schools will be used to prevent substantial variation in the sample size across groups that could otherwise occur if all schools were included in one block, regardless of size.

The intervention group will receive the four-lesson program as part of their school curriculum. Only students whose parents provide informed consent through a signed consent form returned to the school will be eligible to participate in the research element of the study, (i.e., providing personal data through completing the self-report questionnaires). It will be emphasized in the participant information letter that it is entirely up to students and parents/guardians to decide whether to participate or not, and that choosing to not be involved will have no impact on the school or students’ grades. All students within each grade in which the intervention is delivered will receive the SoMe lessons.

**2.5. Data Collection Procedures**

At each data collection, participants will complete a self-report questionnaire through the online survey platform Qualtrics, in a classroom setting in the presence of researchers and school staff members. The researcher who administers the survey will differ from the researcher who delivered the intervention as we will draw upon a pool of researchers. Students will complete the survey on their own device or a school computer. Students’ responses will be linked over time using a unique identification code to ensure confidentiality.

**2.6. Statistical Power and Data Analyses**

The proposed sample size of 350 boys and 350 girls was based on previous research using similar measures (Wilksch et al., 2015), so that after allowing for 30% attrition, we will have 80% power to detect small to medium (*d* = .30) differences between experimental and control groups with alpha = .05.

Missing data will be replaced with the mean of the provided responses for individual variables where 15% or less of data are missing. Univariate outliers that lie 3SD above or below the group mean will be explored and adjusted to the lower or higher within range value as appropriate. Multivariate outliers will also be identified using Mahalanobis’ distance and potentially removed from analyses if their impact on results is found to be substantial. Changes in primary and secondary outcomes will be tested in the intervention group compared to the control group, from baseline to post-intervention, post-intervention to six-months, and post-intervention to 12-months. Time (3 or 4) x Group (2) repeated ANOVAs will be tested to examine interaction and main effects. Post-hoc planned comparisons will be conducted using t-tests to examine changes within groups (intervention vs control) at different time points. Baseline group differences in key demographic variables will be tested using t-tests. Should baseline group differences emerge (e.g., age, SES, BMI), these will be included as covariates (ANCOVA). In addition, exploratory Group x Gender interactions will be tested to examine potential moderators of intervention effects. Mechanisms of intervention effects observed will be explored by testing proposed mediators as predictors of changes in outcomes across time. Among the intervention sample, longitudinal panel analyses, including each of the proposed mediators separately, will be conducted to test for intervention mechanisms with outcome measures for which intervention effects are found. Analyses will be conducted both among the full sample (intent-to-treat) as well as analyses among completers only. To conduct intent-to-treat analyses, the analyses will be conducted using multiple imputation or maximum likelihood techniques.

**3. The Intervention**

* 1. **Theoretical Basis**

SoMe is designed to target sociocultural risk factors for body dissatisfaction through a focus on social media literacy. The SoMe program aims to teach adolescents to think critically about social media messages, which involves analyzing, synthesizing, and evaluating media that they view and create through social media platforms (Thoman & Jolls, 2005). Thinking critically about social media messages enable adolescents to make a judgement about how realistic or unrealistic a social media image is, thereby reducing its persuasive appeal and credibility. This translates to decreased upwards comparisons and internalization, as well as decreased modelling of behaviors depicted on social media for the purposes of weight loss or changing body shape or size (McLean et al., 2016a; McLean, Paxton, & Wertheim, 2016c). In addition, the intervention aims to engage adolescents in a reflection around the way that they use social media, and the content that they contribute to it, with the goal of decreasing social media activities that are appearance-focused.

The SoMe program is also underpinned by principles of media literacy, as defined by the Message Interpretation Process (MIP) model (Austin & Meili, 1994), and Primack’s media literacy framework (Primack et al., 2006; Primack & Hobbs, 2009). The MIP model positions children as active viewers of media and outlines the logic- and affect-based processes through which they interpret media messages. The model suggests that individuals’ affect-based processing can override their logic-based thinking, especially when adolescents perceive media portrayals to be desirable and attractive (Pinkleton, Austin, Chen, & Cohen, 2012). SoMe seeks to strengthen adolescents’ logic-based processing through teaching them to question the perceived *realism* and *desirability* of portrayals, their *similarity* to one’s own experiences, and *expectations* of positive outcomes associated with imitating the behavior promoted by the media message. Primack’s media literacy (ML) framework has three ML theoretical domains: *authors and audiences* (e.g., understanding that authors create media messages for particular purposes), *messages and meaning* (e.g., messages contain values and specific points of view), and *representation and reality* (e.g., that images and messages can omit information and be inaccurate portrayals). SoMe aims to build adolescents’ proficiency in these three domains, in order to lower susceptibility to persuasive social media messages. Both the MIP model and ML framework emphasize the importance of critical thinking skills to deconstruct media messages (McLean et al., 2016a).

Finally, *constructivist teaching principles* will be utilized through the inclusion of hands-on learning experiences that draw upon students’ prior learning (Grace & Henward, 2013) and connect with authentic text to encourage action (Tiilikainen, Karjalainen, Toom, Lepola, & Husu, 2019). A constructivist approach creates meaningful learning experiences for students by drawing upon their real-life experiences and using authentic material such as social media accounts as stimulus. A constructivist approach also emphasizes a collaborative learning approach, where multiple perspectives are encouraged through student input and critical thinking (Tiilikainen et al., 2019).

**3.2. Program Development**

The research team drew upon their extensive experience of developing classroom-based programs for body image and eating disorders (McLean et al., 2017; Richardson & Paxton, 2010), which have been distributed and evaluated internationally (Bird, Halliwell, Diedrichs, & Harcourt, 2013), to develop the current program’s content. The initial stage of program development involved building on the team’s pilot intervention with grade 7 girls (McLean et al., 2017), to create a co-educational intervention. Specifically, the activities included in the pilot study were modified and adapted, with the goal of including real world social media examples that appeal to both genders. A trained teacher with expertise in media literacy education then reviewed and further refined the program. In particular, improvements were made with a focus on pedagogy, including ensuring the interactivity of the learning experiences and adding reflective questions to promote critical thinking. The final stage of program development included focus testing with a teacher expert advisory group. The feedback obtained from the panel centered on ensuring the social media examples selected were relevant as well as providing useful tips on classroom management strategies.

**3.3. Structure and Content**

The four-lesson program (approximately 50 minutes per lesson) was designed to align with the Health and Physical Education Victorian Curriculum Foundation – 10 to enable it to be embedded within the regular school course. Program materials will consist of a structured facilitator manual, PowerPoint slides, and student handouts. Each lesson in the manual is organized into topics with a specific time allotted to each learning experience. Icons are used to provide a quick visual reference for teachers. See Figure 1 as an example of the program layout and Figure 2 as an example of a student worksheet.

The program aims to empower adolescents with skills to critique social media postings including advertising, celebrity postings, and friends’ personal pages. Table 1 provides an overview of the learning experiences. SoMe uses social media examples that are relevant to the target audience of early adolescents, with a mix of media that appeals to both genders. Examples include a video and Instagram feed of popular football players, a Fanta sponsored Snapchat Geofilter, a current McDonald’s social media campaign, and Kim Kardashian’s Instagram feed.

**3.4. Facilitator Training**

Facilitators will be postgraduate psychology, education, and nutrition students. They will receive two half-day training sessions (total eight hours) to deliver the intervention. In the training sessions, facilitators will be provided with an overview of the theoretical basis of the program and research design. The facilitators will be familiarized with the lesson content and structure through a combination of explicit instruction and role-playing the learning experiences. The facilitators will also be provided with classroom management strategies to help keep the students focused and on task. Additionally, there will be opportunities for study personnel to meet with the project team to discuss any issues that arise during lesson delivery.

**3.5. Intervention Fidelity and Student Engagement**

Classroom teachers observing the lessons being taught in the intervention group will be asked to complete a fidelity checklist, which includes a subjective measure of the extent to which each component of the lesson was covered, perceived level of student engagement and understanding, and perceived success of the activity. There will also be two opened-ended questions where classroom teachers can provide feedback on anything they would change about the lessons, and anything they particularly liked about the lesson. The fidelity ratings and comments will be used to provide qualitative feedback on how the lessons were perceived by classroom teachers to inform future refinement of the program. Further, the act of collecting fidelity forms may remind the facilitators of the value of adherence and quality of delivery (Hansen, Pankratz, & Bishop, 2014).

**3.6. Intervention Acceptability**

The acceptability of the intervention will be measured with four items administered at immediate post-test to the intervention group. The questions will ask students to rate on a 5-point scale (1 = *strongly disagree* and 5 = *strongly agree*) whether the sessions are “relevant,” “interesting,” “enjoyable,” and “helpful” to them.

**4. Discussion**

The aim of the current study is to evaluate the efficacy of a school-based social media literacy intervention for early adolescent boys and girls. This project will provide insight into factors that can protect adolescents against damaging effects of social media use on body dissatisfaction, dietary restraint, and strategies to increase muscles, as well as depressed mood and self-esteem.

Strengths of the proposed study are the cluster randomized controlled design, and post, six-month, and 12-month follow-up surveys that will enable the immediate and long-term effects of the intervention to be examined. A further strength is the diverse range of schools that the study is seeking to recruit (combination of public and private and low and high SES) to improve the generalizability of the findings. A potential limitation of the study is its unknown generalizability to other countries. However, other Australian interventions have been successfully translated into a UK environment (Bird et al., 2013), providing some indication of the program’s potential generalizability. Due to the need to keep the questionnaire brief, we assessed physical appearance comparisons, but were unable to assess comparisons more broadly, such as lateral/downward comparisons.A potential drawback of delivering the intervention to mixed-sex groups is the potential for either gender to be reluctant to contribute to class discussions due to feeling self-conscious with the opposite gender present. The facilitators will be provided with tips on how to create a safe and supportive classroom environment to minimize this potential.

Given the real-world context in which the study will be implemented, there will be limitations to the study including the need to randomize grade levels rather than individuals. In addition, the trial was designed such that group level changes could be detected; however, the sample size is inadequate for clustered analyses, which could provide more information at the individual-level. Another limitation will be the use of self-report measures, which rely on the subjective perception of the participants. In light of the large scale of the project, other types of measures such as teacher and parent reports or interviewer-based assessment will not be possible. Gaining parental consent for school-based research is another known challenge that may result in selection bias and influence the sample size.

A systematic review of classroom-based body image programs (Yager et al., 2013) found that nine out of the total 16 programs reviewed were implemented by researchers who were external to the school. The review authors suggested that after programs have demonstrated effectiveness when delivered by a researcher with body image expertise, they should be trialed with delivery by school staff, and prepared for broader dissemination. The SoMe program and study were designed with this goal in mind, with the proposed efficacy study being followed by an effectiveness study. Classroom teachers would receive a condensed form of the facilitator training given that classroom management and teaching ability would be assumed.

The SoMe program was developed to address an unmet need for a co-educational social media literacy program for early adolescents to decrease body dissatisfaction and decrease dietary restraint in the context of the social media environment. The program fits within the school Health and Physical Education Curriculum and utilizes a combination of social media examples that are relevant to the audience of Australian male and female adolescents. The findings from this study will provide practical resources that may be delivered by teachers within regular classes that mitigate the negative impact of social media use.

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Table 1.

*SoMe Lesson Objectives and Key Learning Experiences*

|  |  |  |
| --- | --- | --- |
| Lesson | Objectives | Key learning experiences  |
| Lesson 1 – Critique of social media advertising | 1. Address positive and negative effects of social media use
2. Explore ways in which companies use social media advertising to influence and persuade social media users
 | * ‘Corners’ game where students indicate their social media use by moving to different parts of the room and discuss positives and negatives of social media
* Facilitator led ad deconstruction task (Facebook post and Snapchat post); students consider how the advertisers engage and persuade their audience using specific techniques
 |
| Lesson 2 – Social media – Is it real?  | 1. Improve media literacy skills related to realism and representation in order to deconstruct social media posts
2. Reduce persuasive impact of social media content
 | * Facilitator led review of the homework task on how following something different on social media changes the social media environment
* Small group quiz; students apply deconstruction skills to consider realism in posts
* Individual activity; students analyze and provide written responses on realism in a celebrity’s Instagram postings
 |
| Lesson 3 – Interacting with friends on social media | 1. Spend less time curating online profile
2. Reduce negative emotional response to feedback or lack of feedback
 | * Whole-class viewing of an Instagram vs Real life video, followed by a discussion on how friends may post the ‘highlights’ of their life
* Partner activity where students consider how they could represent their friend’s ‘real’ self by focusing on hobbies, skills, family etc, rather than focusing primarily on appearance.
* Facilitator led discussion about the different ways comments may affect the way someone feels and behaves and helpful ways to provide feedback
 |
| Lesson 4 – Creating positive social media | 1. Develop awareness of the positive impact social media can have on social issues
2. Revise content of lessons 1-3
3. Explore ways to create a representative social media profile
4. Reduce focus on appearance in personal presentation on social media
 | * Facilitator led discussion on how social media can be used to bring about positive social change
* Individual activity; students create a ‘real me’ social media profile, drawing upon the partner activity completed in lesson 3.
 |



Figure 1.*Program Layout in Facilitator Guide.*



Figure 2. *Example Student Worksheet.*