

# A comic-based body image intervention for adolescents in semi-rural Indian schools: Study protocol for a randomized controlled trial



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## ARTICLE INFO

### Article history:

Received 12 January 2022

Received in revised form 24 May 2022

Accepted 27 May 2022

Available online xxxx

### Keywords:

Body image

India

Adolescents

Intervention

School

Randomized controlled trial

Comic

## ABSTRACT

Adolescents in India experience body dissatisfaction, however, empirically supported interventions are lacking. This paper describes the protocol for the development, acceptability testing, and cluster randomized controlled trial (RCT) of a six-session comic-based intervention, which aims to improve body image and related outcomes among adolescents in semi-rural Indian schools. If found to be acceptable and effective, UNICEF will disseminate the intervention across schools in eight states of India. The acceptability study will be conducted with 24 students in Classes 6–8 (age 11–14) and nine teachers from Hindi-medium government schools using interviews and focus groups. The subsequent RCT will be conducted with 2400 students, with schools randomized to either the comic-based intervention or lessons-as-usual (control) groups. The primary outcome is body esteem, and secondary outcomes are disordered eating, appearance ideal internalization, body-image-related life disengagement, self-esteem, negative affect, and positive affect. Additional exploratory outcome measures are skin colour dissatisfaction, body hair dissatisfaction, appearance-based teasing, and endorsement of traditional gender roles. These outcomes will be examined at three timepoints: baseline (*T1*), 1 week-post-intervention (*T2*), and 12-weeks follow-up (*T3*). Analyses will compare outcomes in the intervention with the control group. This will be the first study to evaluate a body image intervention for adolescents in semi-rural Indian schools.

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## 1. Introduction

Body dissatisfaction is recognized as a public mental health issue affecting children, adolescents, young adults, and adults, in high-income countries, including those in Europe, North America, and Australia (e.g., Al Sabbah et al., 2009; Frederick et al., 2022; Sharpe et al., 2018). However, growing research indicates the global prevalence of body dissatisfaction (e.g., Shagar et al., 2019; Maezono et al., 2019; Moehlecke et al., 2020; Swami et al., 2010), including in the world's largest low-middle income country, India (Ganesan et al., 2018; Mondal et al., 2021; Soohinda et al., 2020; United Nations, Department of Economic and Social Affairs, 2019). The nature of body image concerns experienced by this group vary. Some are common to adolescents in high-income countries, such as desires to be thinner (Deb et al., 2017; Singh et al., 2016) and taller (Johnson et al., 2015). However, others have been identified among

adolescents in India, specifically, and relate to dissatisfaction regarding body hair (Phadke, 2017) and skin colour (Peltzer et al., 2016).

Body image concerns in India are associated with harmful consequences, including the use of skin lightening products (Craddock et al., 2018), which not only can cause physical side effects (Chan, 2011), but perpetuates long-standing social inequalities, given that skin shade is deemed a currency of cultural capital in India (Choma & Prusaczyk, 2018). Additional consequences have been identified by prospective research conducted in high-income countries, and include eating pathology (Lewis-Smith et al., 2020), depressive symptoms (Bornioli et al., 2021), low self-esteem (Hochgraf et al., 2018), and engagement in risky health behaviours (e.g., smoking, alcohol and drug consumption, self-harm; Bornioli et al., 2019). While prospective research of this nature is scarce in India, emerging studies suggest similar consequences (Ganesan et al., 2018; Singh et al., 2016; Soohinda et al., 2019). Further, research indicates that broader mental health of young people in India worsens between early and late adolescence (Deb et al., 2017), and the country has one of the highest rates of youth suicide in the world (Patel et al., 2007). This highlights the importance of developing preventative and early

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interventions for mental health issues among adolescents in India, and particularly in relation to body dissatisfaction. Given that 78% of adolescents are reported to experience body dissatisfaction (Mondal et al., 2021), and its association with adverse impacts on physical and mental health (Craddock et al., 2018; Ganesan et al., 2018; Singh et al., 2016), body dissatisfaction is both a public health and social justice issue among adolescents in India.

Schools are one of the best avenues for the delivery of universal body image interventions (Chua et al., 2020; Yager et al., 2013). First, they facilitate a broader reach of adolescents and provide the opportunity for continued interactions in a learning environment, which is imperative for the success of multi-session interventions (Chua et al., 2020). Second, they constitute a relatively cost-effective approach (World Health Organization, 2021), which is particularly important in a country like India where less than 1% of the health-care budget is assigned to the prevention of mental health issues (Math et al., 2019; Jakhar, 2022) and only 10% of young people have access to mental health services (Patel et al., 2007). Third, schools are a prime environment for the socialization of young people, and thus can shape mental health, behaviours, and relationships (Kieling et al., 2011; Valiente et al., 2020). Further, there have been calls for the provision of mental health education via schools in India, including at a governmental level and among parents, teachers, school counsellors, and students (Adolescent Health Division Ministry of Health and Family Welfare Government of India, 2014; Parikh et al., 2019). Collectively, this indicates that schools may constitute a promising platform through which to deliver body image interventions to adolescents in India.

Only one evidence-based body image intervention, known as *Dove Confident Me: 5-Session Workshop Series for Body Confidence* (hereafter referred to as *Confident Me*), has been evaluated among adolescents in Indian schools (Garbett et al., 2021a; Lewis-Smith et al., Under review). *Confident Me* was originally developed in the United Kingdom (UK), based on evidence indicating that the most effective body image interventions were centred around media literacy, self-esteem, and the influence of peers (Yager et al., 2013). The mixed-gender multi-session school-based intervention adopts an aetiological approach, whereby key risk factors for body dissatisfaction, such as low media literacy (McLean et al., 2016), internalization of media ideals (Rodgers et al., 2015), social comparisons in relation to appearance (Rodgers et al., 2015), and appearance-related conversations (Mills & Fuller-Tyszkiewicz, 2017), are targeted. *Confident Me* has been found to significantly improve body image and related outcomes among adolescents in both the UK (Diedrichs et al., 2021; Diedrichs et al., 2015) and Portugal (Torres et al., 2018), and thus underwent a rigorous process of adaptation and acceptability-testing for the Indian context (Garbett et al., 2021a). This was followed by a randomized controlled trial to evaluate the adapted intervention among adolescents in Delhi, India, which demonstrated its efficacy in improving body image and related outcomes up to three months later (Lewis-Smith et al., Under review).

*Confident Me* represents an effective body image intervention for schools in urban India, however, its format may be inappropriate for semi-rural and rural areas; where body image concerns, in addition to harmful gender-based stereotypes (e.g., men are the breadwinners and women belong in the kitchen; Blum et al., 2017; Patel et al., 2021), are prevalent (Johnson et al., 2015; Mondal et al., 2021; Waghachavare et al., 2014). For example, *Confident Me* includes PowerPoint Slides, video stimuli, class discussions and activities, and student activity sheets. While class discussions and activities could be retained for a body image intervention in more rural settings of India, the use of PowerPoint and video stimuli may be inappropriate for all schools in these areas, as some lack technology (e.g., smartboards, internet accessibility; Naik et al., 2020; Sharpe et al., 2018), and their teachers have often not been trained in the instructional

use of technology (Ale et al., 2017). This emphasizes the need to develop a body image intervention that requires minimal infrastructure for use among adolescents in schools in rural parts of India.

Storytelling is an accessible intervention modality. It has been argued that story-based interventions are well placed to target hard-to-reach populations (Brouzos et al., 2016; Giagazoglou & Papadaniil, 2018), such as young people in rural India. Research indicates that children and adolescents can apply learnings from fictional stories to real life, as they can identify themselves with the characters and picture themselves taking part in the actions and behaviours (Brouzos et al., 2016; Hopkins & Weisberg, 2017). Storytelling interventions have demonstrated success with regard to improving body image among children. For example, *Shapesville* is a hardback picture book with rhyming sentences and engaging illustrations, which encourages self-acceptance and diversity (Mills & Osborn, 2013). A randomized controlled trial conducted among girls (range = 5–9 years; mean age = 6.5 years) in Australian primary schools found that *Shapesville* improved appearance satisfaction and internalization of media ideals, relative to an active control group (Dohnt & Tiggemann, 2008). This highlights the potential for using fictional stories to improve body image.

Comic books (or comics) may constitute a potential medium for story-telling to target body image among young people in rural India for several reasons. First, they are likely to have greater appeal to students and deemed more 'fun' than more traditional intervention modalities (Branscum et al., 2013; Matsuzono et al., 2015). Further, they are particularly popular in India, as children learn about the stories of Indian epics, such as *Ramayana* and *Mahabharata*, via stories in comics (McLain, 2009). Finally, they are well placed to target Indian adolescents in rural areas where literacy rates are lower, as the images in comics provide visual cues to the accompanying text (Cohn, 2014; Liu & Elms, 2019), and this format is more popular and increases comprehension and retention in comparison with text alone (Abdulrahman et al., 2020; Spiegel et al., 2013).

Whilst no previous research has explored the potential for comics to improve body image among young people, there is growing evidence of their effectiveness to improve other health-related and psychosocial outcomes among this group, including in low-resource settings. Comic-based interventions have been found to improve knowledge, attitudes and behaviours relating to healthy eating (i.e., consumption of fruits and vegetables; Branscum et al., 2013; Kanyamee et al., 2013; Leung et al., 2017; Leung et al., 2014); physical activity (Branscum et al., 2013); prevention of Hepatitis C, HPV, HIV/AIDS, and other sexually transmitted diseases (Ingrand et al., 2004; Katz et al., 2014; Obare et al., 2013; Willis et al., 2018); burn safety (Sinha et al., 2011); prevention of epilepsy (Cicero et al., 2020); back pain (Kovacs et al., 2011); and asthma (Mickel et al., 2017). Thus, this suggests that comics may be an appropriate intervention modality to target body image among young people in rural India.

One comic-based intervention which has been developed to target gender discrimination and stereotyping among adolescents in rural India is '*AdhaFULL*', which originally began as a TV series developed through a partnership between UNICEF and BBC Media Action (Pasricha et al., 2018). *AdhaFULL* is based on three teen detectives who solve different cases related to social issues salient in India, such as gender stereotyping and discrimination, gender-based sexual harassment and violence, early marriage, girls' higher education, peer pressure, and career choices. Using engaging storylines and characters, *AdhaFULL* models solutions that challenge gender and social norms (Pasricha et al., 2018). With regard to the impact of *AdhaFULL*, mixed-methods research conducted by UNICEF and BBC Media Action among more than 5000 adolescents and 1000 parents has revealed promising findings (BBC Media Action, 2019). Girls and boys felt that the *AdhaFULL* characters were inspirational role models, with girls reporting greater intent to discuss both harassment and their prioritization of education over marriage with their

parents. Boys reported higher levels of self-efficacy to challenge harmful gender norms and greater intent to act as allies for their sisters. Finally, two thirds of parents reported higher intent to provide equal opportunities to boys and girls.

Collectively, the positive impacts of *AdhaFULL* and the evidence for improving body image via storytelling interventions (Dohnt & Tiggemann, 2008) suggest that the *AdhaFULL* comics may constitute an appropriate intervention through which to address and target body image among adolescents in rural India. Therefore, a partnership between the authors, UNICEF, BBC Media Action, and the Dove Self-Esteem Project (DSEP; a social purpose industry initiative) led to the co-development of a comic-based body image intervention centred around the *AdhaFULL* series and teacher-facilitated student activities. Each comic includes a story focusing on a different risk factor (e.g., media pressure to alter appearance, appearance comparisons) for body dissatisfaction, followed by two activities that require students to reflect on the particular risk factor, through role plays and class discussions.

The intervention is based on the Tripartite Influence Model of Body Image (Keery et al., 2004; Shroff & Thompson, 2006; Van den Berg et al., 2002). This theory postulates that appearance ideals are transmitted and reinforced by three sociocultural sources (the media, parents, and peers), of which exert their influences on body image via two psychological processes (internalization of appearance ideals and appearance comparisons). This model has received substantial support among adolescents in North America, Europe, and Australia (e.g., Papp et al., 2013; Rodgers et al., 2015); with components within the model beginning to be explored and supported among adolescents in India (e.g., Singh Mannat et al., 2016). Further, given that most media in India promotes narrow appearance ideals (Parameswaran & Cardoza, 2009), the present comic-based intervention presents a form of media that challenges these ideals, and instead, serves to promote body confidence. If this intervention is found to be effective in improving body image, UNICEF, with the support of DSEP, will scale up and disseminate the intervention across eight states of India using a train-the-trainer approach; whereby a trainer in each state will train teachers at the government schools to deliver this intervention to students aged 11–14 years. This will enable thousands of adolescents to receive the body image intervention at their school.

### 1.1. Research aims and hypotheses

The present research describes the development of the *AdhaFULL* comic-based intervention and is comprised of two studies, including an acceptability study, followed by a cluster randomized controlled trial (RCT). The acceptability study (*Study 1*) aims to explore acceptability of the comic-based intervention among 11–14-year-old school students and their teachers. The feedback provided will inform improvements to the intervention. The cluster RCT (*Study 2*) aims to test the efficacy of a comic-based body image intervention, when delivered by teachers, in improving: (i) the primary outcome of body image, (ii) the secondary outcomes of disordered eating, appearance ideal internalization, body-image-related life disengagement, self-esteem, negative affect, and positive affect, and (iii) the exploratory outcomes of skin colour dissatisfaction, body hair dissatisfaction, appearance-based teasing, and endorsement of traditional gender roles, at post-intervention and 12 weeks later. It is hypothesized that students who receive the comic-based body image intervention will experience immediate and sustained improvements in the primary and secondary outcomes, relative to students in the control condition. There are no hypotheses in relation to the impact of the intervention on the exploratory outcomes.

## 2. Methods

This protocol has been developed in accordance with the SPIRIT 2013 guidelines (Chan et al., 2013). In addition to describing the intervention, we discuss the research methodology to be adopted for each study in turn. This research has received full ethical approval from the university's Ethical Review Committee (HAS.18.01.074) and is registered with ClinicalTrials.gov (NCT04317755).

### 2.1. The intervention

The *AdhaFULL* comics were co-created with the expertise of four stakeholders: the authors, UNICEF, BBC Media Action, and DSEP. Whilst the authors have knowledge and expertise in the development and evaluation of body image interventions, UNICEF have vast experience of creating support interventions for young people in rural India, and finally, BBC Media Action have creative expertise in developing educational and engaging materials, including the original *AdhaFULL* series. A collaborative and iterative process was employed to develop the comics. First, all parties attended an in-person two-day workshop to share their knowledge and expertise with one another.

Employing an aetiological approach, the workshops resulted in an agreed set of themes for the comics to address, with each of the six comics to address an established risk factor for body dissatisfaction. Risk factors included pressure to conform to appearance ideals, media pressure to alter appearance, body talk, and appearance-based comparisons. These mirror the risk factors targeted by *Confident Me*, which was found to effectively improve body image and related outcome among adolescents in urban India (Garbett et al., 2021a; Lewis-Smith et al., Under review). A final risk factor targeted by the comics includes the endorsement of traditional gender roles, as gender inequality is a common issue in rural India (Batra and Reio, 2016; Pande & Astone, 2007; Tisdell, 2002), and greater conformity to traditional gender norms has been associated with greater body image dissatisfaction in high-income Western countries (De Jesus et al., 2015; Gattario et al., 2015). However, research is currently lacking in India; Nagata et al., 2020).

Next, BBC Media Action proposed brief storylines to address the key risk factor for each respective comic. Each of the six comics focuses on a short story, where three protagonists solve a case in a small imaginary town and consequently teach the residents a lesson pertaining to body image (e.g., *how they should not compare their looks to others, how it is impossible to attain appearance ideals*). It was important to ensure that the stories were entertaining, whilst also educational, to increase the likelihood that students would find the storylines engrossing (Leung et al., 2017). Online meetings were convened for the four parties to reflect and discuss each storyline, including its incorporation of the risk factor, creative execution, and applicability to a rural setting. Following a collaborative decision-making process on the final storylines, they were developed into illustrated comics by BBC Media Action. The comics were revised in an iterative cycle based on feedback by both UNICEF and the authors. Revisions included the strengthening of key messages relating to each risk factor, adding greater diversity to the appearance of characters (e.g., *in relation to body shape, skin colour and religion*) and having female protagonists challenge gender stereotypes (e.g., *depicting a female character as being brave*).

Following the storylines, two class activities were developed for each comic to reinforce and consolidate the comic's key takeaways. The use of interactive activities in body image interventions is deemed critical in encouraging students to engage in independent thinking, which will help internalise the intervention's messages (Diedrichs et al., 2021). Further, each comic is accompanied by a Teacher Guide, which helps direct teachers in delivering each session, and has been deemed helpful by Indian teachers previously

**Table 1**  
Outline of comic-based body image intervention.

| Topic/Theme            | Storyline   | Activities  | Main Takeaways   |
|------------------------|---|---|--|
| Gender Stereotypes     | <b>Khajaane Ka Naksha:</b> In this story, Team AadhaFULL and Seema go on a treasure hunt, and Seema realizes that girls can do everything that boys can, and the difference is just in their way of thinking.   | The first activity asks students to identify whether certain activities are usually done by a man, a woman, or both, in their home. The second activity asks the students to draw a list of professions (e.g., doctor, nurse), and then discuss if they drew a male or female figure and why.   | <ol style="list-style-type: none"> <li>1. Understand that appearance and behaviours reflect gender stereotypes.</li> <li>2. Recognize that stereotypes harm both girls and boys and have been passed down in society.</li> </ol>   |
| Appearance Ideals      | <b>Badlipur ke Cheetay:</b> This story is about two siblings who do not want to take part in a sports competition because they are worried about their appearance due to pressure from appearance ideals. AadhaFULL then help them understand that it is more important to appreciate people for their qualities than their appearance, and how much they would miss out on in the form of education, money, and friendships if they spent their time focusing on their appearance. | The first activity asks students to identify the costs associated with trying to match appearance ideals from a list. The second activity asks them to think about a personal quality they admire in an individual.   | <ol style="list-style-type: none"> <li>1. Understand appearance ideals for boys and girls, and the pressure to achieve them.</li> <li>2. Recognize where appearance ideals come from, and the harm caused by trying to match them.</li> <li>3. Reflect on the impact this has on everyday lives, including perpetuating harmful gender norms.</li> </ol>   |
| Media Messages         | <b>Filmstar ka Apharan:</b> This story is about Ranu, who has lost interest in everything around her and has become sad, because she wants to look like the film actress, Sameera Kapoor. Sameera and AadhaFULL then help her realize that celebrities look the way they do in media because the images are manipulated, and that it is not fair to compare oneself to images in media.   | The first activity reinforces that media images are neither realistic nor achievable, and are used to sell products. Students are asked to read the statements in column A (e.g., “After taking photos, they are edited”) and link them with the most appropriate reasons in column B (e.g., “This is performed to change the person’s looks, such as making their complexion fairer.”). The second activity asks students to think about whether they value the people in their lives for their looks or their qualities and think of 5 qualities they admire the most in an individual. | <ol style="list-style-type: none"> <li>1. Critically review and understand how media messages are manipulations of the truth (real-life images).</li> <li>2. Recognize that it is pointless to compare ourselves to images in the media because the images are unrealistic and perpetuate stereotypes.</li> <li>3. Reflect on the reasons individuals in the media manipulate their images.</li> </ol> |
| Appearance Comparisons | <b>Haathi ki Talaash:</b> In this story, Vivek constantly compares himself to Khoobilal, the elephant keeper. AadhaFULL help Vivek to realize that he should stop comparing himself to others, as it will only trouble him and make him feel bad about himself. They also help him understand that he should not worry about looking like anyone else, because everyone is unique and good just as they are.  | The first activity gives students examples of appearance comparisons and asks them to think of ways in which they would change the discussion away from the topic. The second activity asks students to complete 4 statements related to costs associated with comparing oneself to others.   | <ol style="list-style-type: none"> <li>1. Understand that comparing our appearance to those around us and to ideals in media is part of human nature.</li> <li>2. Recognize the negative consequences that comparisons have for us and those around us.</li> </ol>   |
| Body Talk              | <b>Baandh Mein Daraar:</b> This story is about Adrak and Khoobilal and the negative impact of body talk. Both Adrak and Khoobilal realize that commenting on looks (either in a positive or negative manner) has a negative impact and pressurizes individuals to meet appearance ideals and focus on their appearance.   | The first activity gives students examples of body talk and asks them to think of the best way to respond (by completing sentences) to change the topic. The second activity asks them to choose a quality from a given list and give their peers a compliment related to that quality (and not related to their appearance).   | <ol style="list-style-type: none"> <li>1. Understand how often we comment on appearance (body talk) and how this can be harmful when it links to appearance ideals.</li> <li>2. Recognize the problems talking about appearance (body talk) can cause and develop strategies to challenge the same.</li> </ol>   |
| Be the Change          | <b>Bolti Chattan:</b> In this story, AadhaFULL plan a scheme to help everyone in the village remember what they have learnt about challenging appearance pressures. This comic summarizes all the topics covered in the stories, and what has been learnt about appearance pressures from each of them.   | The first activity asks the students to complete statements to indicate key learnings from each of the comics. The second activity asks students to think of different ways in which they would share what they have learnt from the 6 stories with their peers.  | <ol style="list-style-type: none"> <li>1. Understand the concept of appearance ideals and where the pressure to achieve them comes from.</li> <li>2. Develop a plan to champion body confidence in their community.</li> </ol>   |

(Garbett et al., 2021a). Table 1 includes details of each comic and included activities. It should be noted that all materials will be translated to Hindi for the study.

## 2.2. Study 1: acceptability study

### 2.2.1. Study design

A qualitative approach will be adopted to explore students’ and teachers’ acceptability (i.e., thoughts and feedback) on the *AdhaFULL* comics. Online interviews will be conducted with students, whilst online focus groups will be conducted with teachers, both informed by a semi-structured interview schedule. All participants will also be

asked a series of quantitative questions exploring acceptability of the comics.

### 2.2.2. Recruitment and participants

At the request of UNICEF, the Department of Education in Rajasthan will select one school which meets the inclusion criteria to participate in the research; co-educational government school, teaches primarily in Hindi medium, includes Classes 6–8, and is in a semi-rural location. Whilst there is a lack of clarity on the exact number of participants required to facilitate in-depth understanding of qualitative data (Braun, & Clarke, 2021), recent research indicates that nine interviews are necessary to identify a range of themes



within qualitative data, and 16–24 interviews help in developing a rich understanding of each theme identified in the first few interviews (Hennink et al., 2017). Therefore, a total of nine teachers who teach across Classes 6–8 (three teachers from each year group) will be invited to participate in an online focus group (five teachers in one focus group, four teachers in a second focus group). However, a total of 36 students across Classes 6–8 (aged 11–14 years) will be invited to participate in online interviews, whereby the first nine interviews will help in theme identification and the remaining 27 interviews will contribute towards developing a greater understanding of each theme. This sample will be equally divided across the three years, genders, and reading and writing proficiency, which will be assessed by their teachers. This will lead to six girls and six boys in each year group, with three boys and three girls with a higher level of reading and writing proficiency, and three boys and three girls with a lower level of reading and writing proficiency.

### 2.2.3. Interview schedule and acceptability questions

Both the focus groups with teachers and interviews with students will be guided by a semi-structured interview schedule, which will undergo translation to Hindi. Both groups will be asked a series of open-ended questions on the following topics: their understanding of body image (e.g., “Have you had lessons/training on body image or body confidence?”), the relevance of body image issues in semi-rural India (e.g., “How important do you think it is for young people to learn about improving body confidence?”), the extent to which the intervention materials are relatable and engaging (e.g., “What did you like about this story?; Did you find the comics interesting to read?”), their understanding the key messages (e.g., “What do you think were the main messages of the story?”), and aspects which could be improved for increasing the likelihood that the comics will be effective (e.g., “What things would you change or do differently in the comics?”). Teachers will also be asked questions exploring their thoughts on the Teacher Guide (e.g., “Is the Teacher Guide clear?”) and their perception of any challenges delivering the intervention (e.g., “How do you think students would find the activities?”).

In addition, all teachers and students will be asked to complete a brief quantitative acceptability questionnaire. This will explore their views on the comics in relation to their perceived benefit, engaging content, comprehension and understanding, similarity to characters, and likelihood to share similar comics with others. There will be nine items for students (“I think the comics helped me learn about body confidence”; “I can relate to the characters in the comics”; “The characters in the comics are like me and my friends”; “I enjoyed the comics”; “Reading the comics made me feel good about myself”; “I would read more comics like these”; “I would share these comics with my friends”; “I think understanding the language of these comics is easy”; “I found the activities beneficial and interesting”) and eight items for teachers (“I think adolescents would be able to relate to the characters in the comics”; “I think the comics would help adolescents feel good about themselves”; “I think the students would find the comics engaging/enjoyable”; “I would enjoy teaching comics like these”; “I think these comics would help adolescents improve their body confidence”; “I think understanding the language of these comics is easy”; “I think these comics would help adolescents learn about body confidence”). Participants will indicate their level of agreement using a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*), with higher scores indicating greater acceptability.

### 2.2.4. Procedure

On behalf of the authors, who are unable to travel to India due to the COVID-19 pandemic, an International Organization for Standardisation-(ISO)-certified research agency will collect data. This research agency will undergo in-depth briefing in the study

protocols by the authors. Once the school has identified the participating students and teachers, parents of the students will be sent information about the study and a consent form. Once parents have provided consent for their children to participate in the study, students will provide informed assent. Teachers will be provided with information about the study and a consent form. Next, each participant will be sent a copy of the six comics to read at home. A week later, the research agency will conduct the online focus groups with teachers and online interviews with students. Before beginning, all participants will be reassured that they do not have to answer anything they do not feel comfortable with, and that they can withdraw at any time without providing any reason. They will also be provided with the opportunity to ask questions. The interviews and focus groups will be audio-recorded and last between 45 and 60 minutes. Participants will then be asked to complete the brief quantitative questionnaire. Following this, participants will be reminded that they can withdraw their data up to a week later.

### 2.2.5. Data analysis

A Data Management Plan will be prepared in line with requirements of university Research Governance. All data will be stored on a secure encrypted network on the university system. The only participant information that will be assigned to qualitative and quantitative data includes gender, stakeholder (either student or teacher), and age (for students only). Audio-recordings will be transcribed verbatim and anonymized; with no names or pseudonyms attached with any files. The audio-recordings will be permanently deleted following transcription. Transcripts will be simultaneously analysed by two of the authors using qualitative codebook thematic analysis (MacQueen et al., 1998). If discrepancies arise between the coders, they will engage in discussion until agreement is achieved (Fereday & Muir-Cochrane, 2006).

Questionnaire data will be entered into an SPSS file, and descriptive analyses will be conducted on the data. Given that a response of 4 (*agree*) or 5 (*strongly agree*) to a statement (e.g., “I enjoyed the comics”) on a five-point Likert scale indicates a favourable response, these responses will be collapsed to identify the percentage of respondents who responded favourably to the comics. Findings from both the qualitative and quantitative data will be used to optimise the comics and Teacher Guides prior to their evaluation in the RCT through collaboration between the authors, UNICEF, DSEP, and BBC Media Action.

## 2.3. Study 2: RCT

### 2.3.1. Trial design

A parallel two-arm, cluster RCT will be employed to evaluate the *AdhaFULL* comic-based intervention. Schools will be randomized before completion of T1 data collection. The study design comprises two independent groups with outcome data collected at three time points (T1, T2, T3). T1 is baseline (*Week 1*); T2 is 1-week post-intervention (*Week 5*) at the end of intervention; T3 is 12-weeks follow-up (*Week 16*). The resulting data is amenable to standard analysis for two group comparisons including a 2 by 2 by 2 by mixed factorial design with randomized group as a two-level between-subjects fixed factor, trial phase (T2, T3) as a longitudinal two-level repeated measures factor, gender as a two-level fixed factor and with the commensurate baseline measure (T1) as a mean adjusted covariate. Randomized school will be a random factor in the analyses. Following T3 data collection, schools in the control condition will receive all intervention materials, including the training documents for teachers. Fig. 1 provides an overview of the study flow and data collection periods.

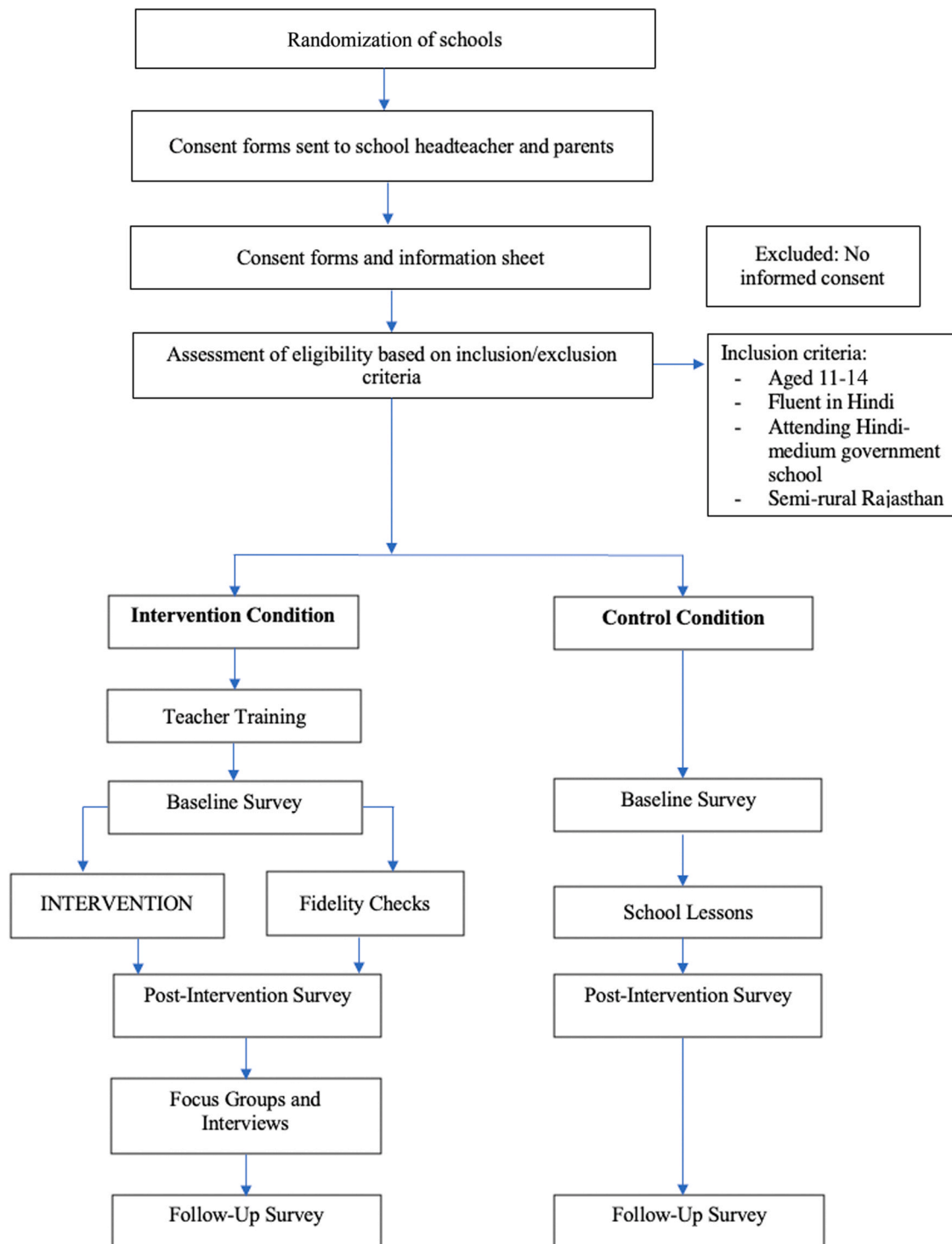


Fig. 1. Study flow.

2.3.2. Recruitment and participants

Government schools in Rajasthan will be recruited using stratified sampling based on two key sociodemographic factors: the degree of ruralness of the area within which the school is located, the school’s exam results. The main recruitment sites will be identified by Rajasthan’s Department of Education, who will select schools that meet the inclusion criteria; co-educational, located in semi-rural areas, Hindi-medium (i.e., Hindi should be the main medium of instruction) and include Classes 6–8 (aged 11–14 years). Once the school principal provides consent to participate in the research, each

school will be randomly allocated to either the intervention or lessons-as-usual control condition. Students in Classes 6–8 (aged 11–14 years) will be invited to participate in the study. Inclusion criteria for the evaluative aspect of the RCT (i.e., data collection) includes students being fluent and literate in Hindi so that they can read and comprehend the comics with minimal assistance. However, illiterate students can be involved in the intervention sessions, as the comics will be read by others in the class. Therefore, they will be able to follow the story, view the accompanying images, and participate in the activities; but will not complete the questionnaires.

**2.3.2.1. Sample size calculations.** The evaluation of *Confident Me* in an urban Indian setting indicated a range of effect sizes for outcome measures with standardized effects in the small to medium range and exceeding an effect size of  $d = 0.2$ , which would minimally be of interest to public health policy makers (Lewis-Smith et al., Under review). For a lower bound of  $d = 0.2$ , a sample size of  $n = 540$  boys and  $n = 540$  girls per arm would have 95% power to detect an effect separately for each gender (two-sided,  $\alpha = 0.05$ ). To account for 10% loss, the sample size will be inflated by  $(540/10 =) 54$  of each gender per arm, and to account for 10% loss within this additional recruitment, a further inflation of  $(54/10 =) 6$  to give a target sample size of 600 boys and 600 girls per arm, totalling 1200 per arm (intervention versus control). Therefore, a total of 2400 students will be recruited. Students will be equally divided across years 6, 7, and 8, and gender.

**2.3.2.2. Randomization.** Participants will be randomized to either the intervention or control arm at the school level. Randomization will be conducted at the school level to avoid spill over effects due to communication about the intervention to the control group. Eligible schools will be randomized in a target 1:1 ratio using minimization with a residual error. The minimization factors are (i) number of students at grade 6, 7 or 8 and (ii) proportion of boys at grade 6, 7, and 8. The first 8 schools will be allocated using blocked randomization thereafter probabilistic minimization will occur with the probability of minimizing set to 0.8.

### 2.3.3. Outcome measures

There are very few body image and related psychological outcome measures which have undergone rigorous validation in India, and those which have, tend to be in English. The outcome measures that will be used in this trial are currently being validated in Hindi by the present authors, with rigorous steps employed (Swami & Barron, 2019). The validation will be completed prior to commencing the present study. Thus, the final items may differ from those in the original scales below and will be reported in the main trial paper.

**2.3.3.1. Primary outcome.** The primary outcome of body image will be measured using the Body Esteem Scale for Adults and Adolescents (BESAA; Mendelson et al., 2001). The BESAA is comprised of three subscales (Appearance, Weight and Attribution) and asks participants about their thoughts and feelings in relation to their body and appearance. Responses to items will be indicated using a 5-point Likert scale, ranging from 1 (*Never*) to 5 (*Always*), with higher scores indicating greater dissatisfaction. Only the combined mean scores for the Appearance and Weight subscales will be used in analyses, as the Attribution subscale relates to the perception of others' attitudes towards one's appearance (e.g., "People my own age like my looks") as opposed to one's own thoughts and feelings about their appearance (Cash, 2002). Further, the Attribution subscale has been indicated as psychometrically weaker than the other two BESAA subscales (Olenik-Shemesh & Heiman, 2017). With regard to the Appearance and Weight subscales, example items include "My looks upset me" (Appearance subscale) and "I am satisfied with my weight" (Weight subscale). The English language BESAA has demonstrated good internal and re-test reliability and construct validity among Indian girls and boys (Garbett et al., 2021b) and other globally diverse adolescent samples (Confalonieri et al., 2008; Erling & Hwang, 2004).

**2.3.3.2. Secondary outcomes.** Eating Disorder Examination Questionnaire. The Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Wilson, 1993) is a 22-item measure of eating pathology, based on the Eating Disorder Examination (Cooper & Fairburn, 1987). This self-report questionnaire asks participants

questions about their thoughts, behaviours and attitudes across the four subscales (Restraint, Eating Concern, Weight Concern and Shape Concern) over a 28-day time period. Example items include "Have you tried to control the amount of food you eat to change your weight or shape (whether or not you have succeeded)?" (Restraint subscale); "How uncomfortable and worried have you been about other people seeing you eat?" (Eating Concern subscale); "Has your weight affected how you think about (judge) yourself as a person?" (Weight Concern subscale); and "Have you felt fat?" (Shape Concern subscale). The items of the EDE-Q are rated on a 7-point ordinal scale ranging from 0 (*0 days*) to 6 (*Everyday*) = 0 and 0 (*Not at all*) to 6 (*Markedly so*). The mean score for all four subscales will be used in the analyses, with higher scores indicating greater disordered eating. The English language EDE-Q is one of the most used measures of disordered eating and has demonstrated excellent reliability and test-retest reliability amongst Indian girls and boys (Lewis-Smith et al., 2021a), as well as in other diverse adolescent samples (Machado et al., 2014; Musa et al., 2016; Penelo et al., 2013).

Sociocultural Attitudes Towards Appearance Questionnaire-3: Internalization-General subscale. The Sociocultural Attitudes Towards Appearance Questionnaire-3 (Thompson et al., 2004) is a widely used 30-item measure of internalization of appearance ideals. The measure includes four subscales: Information, Media Pressure, Internalization-General and Internalization-Athlete. Responses to items are indicated using a 5-point Likert scale, ranging from 1 (*Totally disagree*) to 5 (*Totally agree*), with higher scores indicating greater internalization. The mean score for the Internalization-General subscale will be used in analyses. Example items include "I would like my body to look like the models who appear in magazines" and "I compare my appearance to the appearance of TV and movie stars". The English language Internalization-General subscale has shown good test-retest reliability and convergent validity amongst Indian girls and boys (Lewis-Smith et al., 2021b), in addition to other culturally diverse adolescents in China, Lithuania, Iran and Italy (Jackson & Chen, 2010; Jankauskiene et al., 2016; Mousazadeh et al., 2017; Stefanile et al., 2011).

Body Image Life Disengagement Questionnaire. The Body Image Life Disengagement Questionnaire (BILD-Q) is a 9-item measure assessing the extent to which body image concerns have stopped the respondent from engaging in activities (Atkinson & Diedrichs, 2021). Example activities (i.e., items) include "go to the doctor" and "go to school". Items such as "going to swim in the river" have been added to make this measure more culturally appropriate for the Indian context. Responses to items will be indicated using a 4-point Likert scale, ranging from 1 (*Hasn't stopped me at all*) to 4 (*Stopped me all the time*), with higher scores indicating greater life disengagement. The measure has been validated amongst British adolescents and demonstrated good test-retest reliability, internal consistency and construct and convergent validity (Atkinson & Diedrichs, 2021), and is currently being validated amongst Indian adolescents.

Rosenberg Self-Esteem Scale. The 10-item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is one of the most widely used measures of self-esteem. Responses to items (such as "On the whole I am satisfied with myself" and "I certainly feel useless at times") will be indicated using a 4-point Likert scale, ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*), with higher scores indicating greater self-esteem. The mean score for all items will be used in analyses. The scale has demonstrated high reliability and validity amongst diverse population samples (Gómez-Lugo et al., 2016; Michaelides et al., 2016; Schmitt & Allik, 2005), and is currently being validated amongst Indian adolescents.

Positive and Negative Affect Scale – Children. The Positive and Negative Affect Scale – Children (PANAS-C; Laurent et al., 1999) is a 10-item measure with two subscales: Positive Affect and Negative Affect. The respondent is asked to indicate the extent to which they

have experienced 10 emotions (such as “sad”, “scared” and “happy”) over the last few weeks, using a 5-point Likert scale, with responses ranging from 1 (*Not at all*) to 5 (*Extremely*). The mean score for each subscale will be used in analyses. The PANAS-C has good validity and reliability in diverse adolescent samples (Ciucci et al., 2017; Guse & van Zyl, 2021; Ortuño-Sierra et al., 2019; Wróbel et al., 2019), and is currently being validated amongst Indian adolescents.

**2.3.3.3. Exploratory outcomes.** Skin colour dissatisfaction. A single-item measure has been developed for the study to measure dissatisfaction with skin colour (“How satisfied or dissatisfied are you with the colour of your skin?”). There is no specific time frame to reflect upon. Respondents will indicate their degree of satisfaction or dissatisfaction on a 5-point Likert scale (e.g., ranging between 1 = *Very satisfied* and 5 = *Very dissatisfied*).

Body hair dissatisfaction. A single-item measure has been developed for the study to measure dissatisfaction with body hair (“How satisfied or dissatisfied are you with the amount of hair on your body?”). There is no specific time frame to reflect upon. Respondents will indicate their degree of satisfaction or dissatisfaction on a 5-point Likert scale (e.g., ranging between 1 = *Very satisfied* and 5 = *Very dissatisfied*).

Appearance-based teasing. A single-item measure was adapted from a previous evaluation of *Confident Me* (Diedrichs et al., 2021; “How often have you been teased about the way you look?”). Respondents will be asked to reflect over the past two weeks and indicate their degree of agreement on a 5-point Likert scale 5 ranging from 1 (*Never*) to 5 (*Always*).

Endorsement of traditional gender roles. A 10-item scale was developed for the study to assess the endorsement of traditional gender roles. Whilst there are already existing scales (Mills et al., 2012; Pulerwitz & Barker, 2008; Zeyneloglu & Terzioglu, 2011), their comprising items do not reflect Indian gender norms nor capture the changes anticipated from participating in the comic-based intervention, such as a deeper understanding of gender stereotypes and gender equality. Therefore, using items from these different scales, a new scale of ten items (e.g., “The ability to earn and be the head of the family should be the priority for men”; “Girls should stay at home to do housework instead of going outside to play”; “The education of boys is more important than the education of girls”) has been developed by co-authors. There is no specific time frame to reflect upon. Responses to items will be indicated using a 5-point Likert scale, ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), with higher scores indicating greater endorsement of gender roles.

**2.3.3.4. Other measures.** Demographics. Demographic information will be collected from students in the T1 questionnaire, including age, gender, religion, language spoken at home, the family’s primary wage earner’s level of education, parents’ occupations, number of bedrooms in the house, and whether certain electronic items are owned by the household (e.g., television, computer). The socio-economic status of participants will be estimated using India’s New Consumer Classification System (NCCS; Kakati & Ahmed, 2016).

Intervention acceptability. Acceptability of the comic-based intervention will again be assessed among students in the intervention condition via the T2 questionnaire. They will be asked to indicate their degree of agreement or disagreement using a five-point Likert scale (1 = *Strongly disagree* to 5 = *Strongly agree*) with statements concerning their perceptions of the intervention (e.g., “I enjoyed the lessons”, “I understood what was being taught in the lessons”, “I think adolescents would find the activities beneficial and interesting”). Teachers will also be asked to complete a brief questionnaire to assess intervention acceptability. They will be asked to indicate their degree of agreement or disagreement using a five-point Likert scale (1 = *Strongly disagree* to 5 = *Strongly agree*) with statements regarding their perceptions of intervention delivery and

student engagement (e.g., “I enjoyed delivering these lessons”, “Students understood the key messages of these lessons”, “I felt confident delivering these sessions”). A subgroup of teachers and students will be invited to participate in separate focus groups or interviews, to explore intervention acceptability in greater depth from both perspectives.

Attention checks. To assess the degree of attention from participants whilst completing each questionnaire, attention checks will be embedded throughout at all three time-points. These items will instruct participants to select a specific response on a Likert scale (e.g., Please select ‘*Strongly Agree*’). There will also be attention checks which are specific to each comic’s storyline in the T2 survey. These will be used to assess participants’ recall of the comics and to determine the number of participants that were present in each session. There will be a question about each comic (e.g., “Why does Seema’s mother stop her from playing outside?”), to which participants will need to select the correct answer from four options (e.g., “she wants Seema to study for school”, “she says it’s too dark to play outside”, “I did not attend Session 1/do not recognize the story”).

Intervention fidelity. A proportion of sessions will be observed by researchers, and teachers will be asked to audio-record the delivery of their sessions. Fidelity assessment will be based on previous school intervention evaluation studies (Garbett et al., 2021a; Diedrichs et al., 2021), whereby a standardized checklist will assess three domains: *perceived facilitator competence, the extent to which learning outcomes were met, and adherence to the intervention*. Sessions with both audio and live observation will be used to assess interrater reliability.

### 2.3.4. Procedure

Ethical guidelines for conducting anonymous public health research in India (Indian Council of Medical Research, 2018) indicate that parental consent is sought at the school’s discretion. However, with the permission of Department of Education of Rajasthan in India, parents will be given two weeks to provide opt-out consent. Additionally, the children will be provided with information about the study and given the opportunity to ask questions before they indicate written assent. The research agency will liaise with each recruited school to decide on an alternative activity for the students without consent/assent. This will take place outside of the classroom where the intervention is being delivered or data collection is occurring. Once all consent procedures have been completed, a team of trained researchers from an ISO-certified research agency will administer T1 outcome assessments via a self-report paper survey with all students irrespective of randomized arm. All students will complete the surveys in a quiet classroom in the presence of a researcher and schoolteacher and will be encouraged to complete the questions independently (T1). Further outcome assessments will be administered via paper questionnaires in the week following the final session of the intervention (T2) and at 12-weeks follow-up (T3). Once outcome assessments have been completed by students, the data will be entered into a password-protected Excel spreadsheet, and subsequently imported into an SPSS data file for analysis. A Data Management Plan will be prepared in line with requirements of university Research Governance. This data will be stored on a secure encrypted network on the university system. Participants will not be identifiable, as they will only be required to create a participant ID consisting of a combination of letters and numbers (e.g., the last two letters of their surname). This will be used to connect data across the three time-points. Fig. 2 includes the schedule for participant enrolment, delivery of the intervention, and outcome assessment.

With regard to intervention delivery, a ‘train-the-trainer’ approach will be adopted. This will involve having expert trainers (i.e. the authors, who are experienced in the train-the-trainer approach) teach non-expert providers (i.e., the research agency) how to subsequently train teachers in delivery of the intervention. The train-




| Acceptability Trial                             |                          |            |       |  |       |           |
|---|--------------------------|------------|-------|--|-------|-----------|
|   | Recruitment              | Allocation | Trial |  |       | Close-out |
| TIMEPOINT                                       | $-t_1$                   | 0          | $t_1$ |  |       | $t_x$     |
| ENROLMENT:                                      |                          |            |       |  |       |           |
| Eligibility screen                              | X                        |            |       |  |       |           |
| Informed consent                                | X                        |            |       |  |       |           |
| Materials sent home to participants             |                          | X          |       |  |       |           |
| INTERVENTIONS                                   |                          |            |       |  |       |           |
| Participants read comic books and teacher guide |                          |            |       | X  |       |           |
| ASSESSMENTS:                                    |                          |            |       |  |       |           |
| Interviews                                      |                          |            |       | X  |       |           |
| Focus Groups                                    |                          |            |       | X  |       | X         |
| Randomized Controlled Trial                     |                          |            |       |  |       |           |
|   | Recruitment              | Allocation | Trial |  |       | Close-out |
| TIMEPOINT                                       | $-t_1$                   | 0          | $t_1$ | $t_2$  | $t_3$ | $t_x$     |
| ENROLMENT:                                      |                          |            |       |  |       |           |
| Allocation                                      |                          | X          |       |  |       |           |
| Eligibility screen                              | X                        |            |       |  |       |           |
| Informed consent from school and parents        |                          | X          |       |  |       |           |
| Informed Consent from students                  |                          | X          |       |  |       |           |
| INTERVENTIONS:                                  |                          |            |       |  |       |           |
| Comic-based body image intervention             |                          |            |       |  |       |           |
| ASSESSMENTS:                                    |                          |            |       |  |       |           |
| Baseline Assessment (Week 1)                    |                          |            | X     |  |       |           |
| Week 5  |                          |            |       | X  |       |           |
| Week 16   |                          |            |       |  | X     |           |
| Acceptability Focus Groups and Interviews       |                          |            |       | X  |       |           |
| Item  | Category                 |            |       |  |       |           |
| $-t_1$  | Recruitment period       |            |       |  |       |           |
| $t_1$   | Baseline data collection |            |       |  |       |           |
| $t_2$   | Week 5 data collection   |            |       |  |       |           |
| $t_3$   | Week 16 data collection  |            |       |  |       |           |
| $t_x$   | Focus groups             |            |       |  |       |           |

Fig. 2. Schedule for participant enrolment, delivery of the intervention, and outcome assessment.

the-teacher approach has demonstrated efficacy in previous body image intervention evaluations (Greif et al., 2015; Kilpela et al., 2014) and facilitates scalability and sustainability. The research agency will receive a two-day training course, and subsequently, teachers will receive a one-day training course. The teacher training will cover the theoretical basis of the intervention, including risk factors for body dissatisfaction, and the associated consequences. Subsequently, the teachers will be familiarised with the comics and associated activities and will participate in role plays to practise delivering the intervention. Finally, they will be given hints and tips for delivering the sessions and practise answering challenging questions that could be posed by the students. All schools in the intervention condition will begin the intervention in the week following T1 outcome assessment. Teachers will deliver each session during a school lesson, and the six sessions will be delivered at a rate of two sessions per week. Each session will begin with the teacher reading the comic with the class. When finished, the teacher will ask the students for their feedback on the comic and clarify any words/sentences that students struggled to understand. Following this, the two activities (activity one being mandatory and activity two optional) associated with the respective comic will take place, with the teacher facilitating these. Once discussed and completed, the session will come to an end.

### 2.3.5. Statistical analyses

The full prospective Statistical Analysis Plan is summarised. Analyses will be conducted on an Intention-to-Treat (ITT) basis. Additional per protocol (PP) analyses will be performed. The per protocol analysis set will comprise those who provide outcome data and pass attention control checks requiring  $> = 80\%$  of all attention control questions to be correctly answered. Missing data sensitivity analyses will be performed on both the ITT analysis set and the PP analysis set.

The primary outcome variable is the BESAA. The analysis plan for the secondary outcomes of the EDE-Q, Internalization-General, BILD-Q, PANAS-C and RSES, and the exploratory outcome of endorsement of traditional gender norms will be the same as the BESAA. A linear mixed model will be used to examine the 2 by 2 by 2 factorial design (Randomized Arm [Control, Intervention], Phase [T2, T3], Gender [Male, Female]) using a hierarchically balanced model comprising all two-way interactions and two-way interactions with the baseline mean adjusted covariate. The model will additionally include school as a random factor, and a sensitivity analysis relating to the inclusion-exclusion of this effect will be conducted. Underpinning model assumptions will be examined. ANCOVA with mean adjusted baseline measure as covariate will be used to compare randomized arms at T2 and T3. The homogeneity of regression lines assumption will be assessed. In addition, separate sub-group analyses for boys and girls will be performed. Cohen's  $d$  and partial eta squared will be used to quantify standardized effect size, along with unadjusted means and 95% confidence intervals. Percentages reporting positive change, no change, and a poorer outcome, along with 95% confidence intervals will be reported. This study has multiple outcome measures (MOMs) at multiple time points. To limit serendipitous conclusions from MOMs, we will additionally report unadjusted  $p$ -values of the secondary outcomes at each of T2 and T3 along with results after controlling the False Discovery Rate (Benjamini & Hochberg, FDR using 0.2) and commit to reflecting this in the conclusions.

**2.3.5.1. Exploratory analyses.** Exploratory outcome measures of skin colour dissatisfaction, body hair dissatisfaction, and appearance-based teasing, are single ordinal exploratory outcomes and will be compared between randomized groups at T2 and T3 using an ordinal logistic link controlling for baseline measures. Gender sub-group analyses will also be conducted.

Additionally, mediation analysis will be used to investigate whether interventional changes in body esteem between T1 and T3, and body esteem at T3, are mediated by changes in internalization of appearance ideals between T1 and T2, and whether mediation is gender dependent.

## 3. Discussion

Body dissatisfaction is an increasing public health concern among adolescents in India (Ganesan et al., 2018; Mondal et al., 2021). In light of growing research indicating that body dissatisfaction is related to adverse mental and physical health (Craddock et al., 2018; Ganesan et al., 2018; Singh Mannat et al., 2016), it is timely and important to develop and evaluate culturally appropriate interventions targeting body dissatisfaction among Indian adolescents. While an evidence-based school body image intervention has been developed and shown to be effective for use in urban Indian schools (Garbett et al., 2021a; Lewis-Smith et al., Under review), there are currently no evidence-based body image interventions suited to schools in more rural settings. Thus, the present research is the first of its kind to evaluate a comic-based body image intervention for adolescents in semi-rural India. By the end of the cluster RCT, we will have explored the acceptability of the comics; informing improvements to the intervention for the trial, and subsequently tested whether the comic-based intervention improves the primary outcome of body image, secondary outcomes (e.g., disordered eating, self-esteem), and exploratory outcomes (e.g., appearance-based teasing, body hair dissatisfaction), in both the short-term (post-intervention) and longer term (12 weeks later).

Whilst the present research holds huge promise, it is important to discuss the potential challenges that may be faced. First and foremost, we are still experiencing the coronavirus (COVID-19) global pandemic. As a consequence, many government schools remain closed for face-to-face class-based learning, with students working independently from home instead. Whilst there is promising news daily suggesting that schools will re-open for normal classes soon, the original plans for the RCT may need to be altered to accommodate schools being closed. In this case, a researcher would deliver the intervention week-by-week to students independently in their homes. There may also be issues relating to recruitment, irrespective of whether schools resume face-to-face classes. If schools do not respond to the research invite, the agency will re-contact the school principal twice more. If schools respond and decline to participate, the agency will offer to provide an in-depth information session, where they will respond to any concerns the school principal may have. With regard to parents, if they do not return consent forms, the agency will telephone the household daily for one week. If more than 50% of parents in each school do not consent to their children participating in the research, reasons for non-participation will be systematically reviewed. These reasons will be addressed in an information session for these parents, who would hopefully feel more comfortable consenting to their child's participation. If it is not possible to recruit enough students via schools, the agency will aim to recruit students with similar demographics outside of the schools. An additional recruitment challenge pertains to schools accommodating the research within their academic calendar. Indian schools tend to have frequent breaks for festivals, holidays, and exams. Therefore, it may be difficult to schedule six bi-weekly intervention sessions, plus an extra three weeks for pre- and post-, and follow-up data collection. Whilst efforts will be made to implement the intended timetable with the school upon recruitment, it is important to expect potential disruptions.

### 3.1. Strengths and limitations

This research has numerous strengths. First, the intervention under evaluation was developed based on a combination of well-supported sociocultural theory (Keery et al., 2004; Shroff & Thompson, 2006; Van den Berg et al., 2002), an existing evidence-based body image intervention for adolescents in urban Indian schools (Garbett et al., 2021a; Lewis-Smith et al., Under review), and a television and comic series which has demonstrated promising psychosocial outcomes among adolescents in semi-rural India (BBC Media Action, 2019). Relatedly, the intervention was co-created by stakeholders with complementary expertise and experience, including the development and evaluation of body image interventions (the authors), understanding of psychosocial issues faced by adolescents in semi-rural India (UNICEF), skills to develop engaging education materials (BBC Media Action), and insights on body confidence in India, in addition to funding to develop and disseminate scalable body image interventions (DSEP). Collectively, this enabled the development of a body image intervention which instills confidence of being engaging as well as effective among adolescents in semi-rural India. Second, a rigorous design is being employed, including the use of an acceptability study to refine the intervention before the trial, which includes a control group, randomization, follow-up at 12 weeks, and validated outcome measures. The importance of exploring acceptability of interventions has been highlighted in leading guidelines for the development and evaluation of interventions (Craig et al., 2008; Eldridge et al., 2016). Further, the use of a lessons-as-usual control condition will reduce threats to internal validity whilst ensuring that all students will eventually receive the intervention (Mohr et al., 2009). Randomization at the school level will reduce contamination effects (Donner & Klar, 2000), and 12-weeks follow-up has been recommended as the minimum follow-up time to assess longer-term effects of interventions (Yager et al., 2013). Additionally, the outcomes measures will have been validated using a strict process (Swami & Barron, 2019), whereas previous research conducted in India has tended to simply translate scales to Hindi, whilst missing other key stages of the validation process. Third, the present research will be the first ever evaluation of a comic-based body image intervention. There is already support for the use of comic-based interventions to target other health-related and psychosocial outcomes, and if found to be effective in improving body image among adolescents in semi-rural India, this intervention modality could be used to target body image in other groups.

Whilst the present research has several strengths, it is also associated with limitations. First, there is no active control group, as there no other comparable body image resources which have been evaluated among semi-rural schools in India. However, given that the intervention is universal in nature and is not specifically targeting individuals with high levels of body dissatisfaction, it is not anticipated that students in the control condition will deteriorate drastically in their body image over a three-week period. Second, randomization at the school level increases the risk of selection bias, as characteristics tend to be more similar between participants in the same cluster (i.e., school) than in different clusters (Hutchison & Styles, 2010). Third, the data collectors, trainers, teachers, and students, will not be concealed to the intervention. However, the associated risk of performance bias is common with psychosocial interventions (Hutchison & Styles, 2010). Fourth, as the intervention is being evaluated in Rajasthan, the findings may not be applicable to other semi-rural parts across India, given the country's cultural, linguistic, and socioeconomic diversity (Tsimplici et al., 2020; Upadhyay & Hasnain, 2017).

### 3.2. Implications

If the findings of this research indicate that the intervention is acceptable and effective, it will be the first evidence-based body image intervention for adolescents in semi-rural Indian schools. It

will have the potential to improve the body image of thousands of students across eight states of India via UNICEF who will implement a train-the-trainer dissemination model. Evidence for the efficacy of the intervention will also answer calls from the government, teachers, parents, and students, for the provision of mental education at schools, which is currently lacking (Adolescent Health Division Ministry of Health and Family Welfare Government of India, 2014; Parikh et al., 2019). It may guide policy makers towards national implementation of the intervention, and thus facilitate its delivery to millions of students across the other twenty-one states of India. The intervention would be associated with low costs of implementation in government schools, as minimal resources are required, including no need for mental health specialists. This is an important consideration when less than 1% of India's healthcare budget is assigned to mental health (Math et al., 2019). Further, task-shifting has been recommended for enabling scalability of mental health interventions in low-middle income countries (Kazdin, 2019). An additional benefit of having teachers deliver the intervention is the opportunity for them to develop their understanding of the risks for, and consequences of, body image concerns. This will enable them to intervene when they witness appearance-based teasing, body talk, or other behaviours which are recognized risk factors for body image concerns, among students.

The present research will enhance currently limited understanding of the implementation of body image interventions in semi-rural India, and in low-middle income countries more broadly. If found to be acceptable and effective, the intervention may warrant adaptation and evaluation among other South Asian countries, such as Pakistan, Bangladesh and Sri Lanka. Whilst these countries are culturally unique, they share some characteristics with India, such as strong family pressure (Arif et al., 2019; Sawitri et al., 2014) and gender-related stereotypes (Ali et al., 2011; Islam & Asadullah, 2018). These potential risk factors are targeted in the comic-based intervention, suggesting that with some adaptations, it may be also appropriate for adolescents in these countries. More broadly, the comic book modality might represent a potential intervention model for other mental health issues faced by adolescents in India and in other low-middle income countries, given the limited resources needed and possibility for scalability.

## 4. Conclusion

This paper documents the collaborative development of a comic-based body image intervention between the authors, UNICEF, BBC Media Action, and DSEP. It also describes the protocol relating to its acceptability and efficacy testing. This will be the first study to evaluate a culturally appropriate body image intervention for adolescents in semi-rural Indian schools. If found to be acceptable and effective, its dissemination via UNICEF and DSEP will have the potential to improve the body image of thousands of Indian adolescents and help to meet the mental health needs of India.

## Funding

The study is funded by a research grant from the Dove Self-Esteem Project (DSEP; Unilever). The funders have no role in data analysis, decision to publish, or manuscript preparation. The DSEP were permitted to review the manuscript and suggest changes, but the authors exclusively retained the final decision on content. The views expressed are those of the authors and not necessarily those of Unilever.

## CRedit authorship contribution statement

**Helena Lewis-Smith:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Visualization, Supervision,

Project administration, Funding acquisition, **Farheen Hasan:** Methodology, Writing – original draft, Writing – review & editing, Visualization, Project administration. **Latika Ahuja:** Methodology, Writing – original draft, Writing – review & editing, Visualization, Project administration. **Paul White:** Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Phillippa Diederichs:** Conceptualization, Methodology, Writing – review & editing, Visualization, Supervision, Project administration, Funding acquisition.

## Declarations of Interest

HLS and PD are independent consultants to the Dove Self-Esteem Project, and PD was on the Dove Self-Esteem Project Global Advisory Board from 2013 to 2016. The authors declare that they have no competing interests.

## Acknowledgements

The authors wish to thank the Dove Self-Esteem Project, UNICEF and BBC Media Action for their partnership in developing the body image intervention.

## References

- Abdulrahman, M. D., Faruk, N., Oloyede, A. A., Surajudeen-Bakinde, N. T., Olawoyin, L. A., Mejabi, O. V., & Azeez, A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, 6(11), Article e05312. <https://doi.org/10.1016/j.heliyon.2020.e05312>
- Al Sabbah, H., Vereecken, C. A., Elgar, F. J., Nansel, T., Aasvee, K., Abdeen, Z., & Maes, L. (2009). Body weight dissatisfaction and communication with parents among adolescents in 24 countries: International cross-sectional survey. *BMC Public Health*, 9(1), 1–10. <https://doi.org/10.1186/1471-2458-9-52>
- Ale, K., Loh, Y. A.-C., & Chib, A. (2017). Contextualized-OLPC education project in rural India: Measuring learning impact and mediation of computer self-efficacy. *Educational Technology Research and Development*, 65(3), 769–794. <https://doi.org/10.1007/s11423-017-9517-2>
- Ali, T. S., Krantz, G., Gul, R., Asad, N., Johansson, E., & Mogren, I. (2011). Gender roles and their influence on life prospects for women in urban Karachi, Pakistan: A qualitative study. *Global Health Action*, 4(1), 7448. <https://doi.org/10.3402/gha.v4i0.7448>
- Arif, S., Iqbal, J., & Khalil, U. (2019). Factors influencing students' choices of academic career in Pakistan. *FWU Journal of Social Sciences*, 13(1), 35–47.
- Atkinson, M. J., & Diederichs, P. C. (2021). Assessing the impact of body image concerns on functioning across life domains: development and validation of the body image life disengagement questionnaire (BILD-Q) among British adolescents. *Body Image*, 37, 63–73. <https://doi.org/10.1016/j.bodyim.2021.01.009>
- Batra, R., & Reio, T. G., Jr. (2016). Gender inequality issues in India. *Advances in Developing Human Resources*, 18(1), 88–101. <https://doi.org/10.1177/1523422316630651>
- BBC Media Action, 2019, Gender is not destiny: Turning Indian girls and boys into allies through TV drama. Retrieved from (<https://www.bbc.co.uk/blogs/mediaactioninsight/entries/cb7b056c-ffb3-47a0-8f3c-243f485ff3aa>).
- Blum, R. W., Mimi, K., & Moreau, C. (2017). It begins at 10: How gender expectations shape early adolescence around the world. *The Journal of Adolescent Health*, 61(4 Suppl), S3–S4. <https://doi.org/10.1016/j.jadohealth.2017.07.009>
- Bornioli, A., Lewis-Smith, H., Slater, A., & Bray, I. (2021). Body dissatisfaction predicts the onset of depression among adolescent females and males: A prospective study. *Journal of Epidemiology and Community Health*, 75(4), 343–348. <https://doi.org/10.1136/jech-2019-213033>
- Bornioli, A., Lewis-Smith, H., Smith, A., Slater, A., & Bray, I. (2019). Adolescent body dissatisfaction and disordered eating: Predictors of later risky health behaviours. *Social Science & Medicine*, 238, Article 112458. <https://doi.org/10.1016/j.socscimed.2019.112458>
- Branscum, P., Sharma, M., Wang, L. L., Wilson, B. R., & Rojas-Guyler, L. (2013). A true challenge for any superhero: an evaluation of a comic book obesity prevention program. *Family & Community Health*, 36(1), 63–76. (<https://www.jstor.org/stable/48515342>).
- Braun, V., & Clarke, V. (2021). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, 9(1), 3–26. <https://doi.org/10.1037/qp0000196>
- Brouzos, A., Vassilopoulos, S. P., & Moschou, K. (2016). Utilizing storytelling to promote emotional well-being of children with a distinct physical appearance: The case of children who wear eyeglasses. *The European Journal of Counselling Psychology*, 4(1), 62–76. <https://doi.org/10.5964/ejcop.v4i1.96>
- Cash, T. F. (2002). Cognitive-behavioral perspectives on body image. In T. F. Cash, & T. Pruzinsky (Eds.), *Body Image: A Handbook of Theory, Research, and Clinical Practice* (pp. 38–46). New York: Guilford.
- Chan, A.-W., Tetzlaff, J. M., Altman, D. G., Laupacis, A., Gøtzsche, P. C., Krleža-Jerić, K., & Berlin, J. A. (2013). SPIRIT 2013 statement: Defining standard protocol items for clinical trials. *Annals of Internal Medicine*, 158(3), 200–207. <https://doi.org/10.7326/0003-4819-158-3-201302050-00583>
- Chan, T. Y. (2011). Inorganic mercury poisoning associated with skin-lightening cosmetic products. *Clinical Toxicology*, 49(10), 886–891. <https://doi.org/10.3109/15563650.2011.626425>
- Choma, B. L., & Prusaczyk, E. (2018). The effects of system justifying beliefs on skin-tone surveillance, skin-color dissatisfaction, and skin-bleaching behavior. *Psychology of Women Quarterly*, 42(2), 162–177. <https://doi.org/10.1177/0361684317747845>
- Chua, J. Y. X., Tam, W., & Shorey, S. (2020). Research Review: Effectiveness of universal eating disorder prevention interventions in improving body image among children: A systematic review and meta-analysis. *Journal of Child Psychology and Psychiatry*, 61(5), 522–535. <https://doi.org/10.1111/jcpp.13164>
- Cicero, C. E., Giuliano, L., Todaro, V., Colli, C., Padilla, S., Vilte, E., & Zappia, M. (2020). Comic book-based educational program on epilepsy for high-school students: Results from a pilot study in the Gran Chaco region, Bolivia. *Epilepsy & Behavior*, 107, Article 107076. <https://doi.org/10.1016/j.yebeh.2020.107076>
- Ciucci, E., Baroncelli, A., Tambasco, G., Laurent, J., Catanzaro, S. J., & Joiner, T. E. (2017). Measuring positive affect, negative affect, and physiological hyperarousal among Italian youth: Translations of the PANAS-C and PH-C. *Journal of Psychopathology and Behavioral Assessment*, 39(3), 373–382. <https://doi.org/10.1007/s10862-017-9596-8>
- Cohn, N. (2014). The architecture of visual narrative comprehension: the interaction of narrative structure and page layout in understanding comics. *Frontiers in Psychology*, 5, 680. <https://doi.org/10.3389/fpsyg.2014.00680>
- Confalonieri, E., Gatti, E., Ionio, C., & Traficante, D. (2008). Body Esteem Scale: A validation on Italian adolescents. *Psychometrics: Methodology in Applied Psychology*, 15(3), 153–165.
- Cooper, Z., & Fairburn, C. (1987). The Eating Disorder Examination: A semi-structured interview for the assessment of the specific psychopathology of eating disorders. *International Journal of Eating Disorders*, 6(1), 1–8. [https://doi.org/10.1002/1098-108X\(198701\)6:1<1::AID-EAT2260060102>3.0.CO;2-9](https://doi.org/10.1002/1098-108X(198701)6:1<1::AID-EAT2260060102>3.0.CO;2-9)
- Craddock, N., Dlova, N., & Diederichs, P. C. (2018). Colourism: a global adolescent health concern. *Current Opinion in Pediatrics*, 30(4), 472–477. <https://doi.org/10.1097/MOP.0000000000000638>
- Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: The new Medical Research Council guidance. *BMJ*, 337, 979–983. <https://doi.org/10.1136/bmj.a1655>
- De Jesus, A. Y., Ricciardelli, L. A., Frisén, A., Smolak, L., Yager, Z., Fuller-Tyszkiewicz, M., & Gattario, K. H. (2015). Media internalization and conformity to traditional masculine norms in relation to body image concerns among men. *Eating Behaviors*, 18, 137–142. <https://doi.org/10.1016/j.eatbeh.2015.04.004>
- Deb, S., Sathyanarayanan, P., Machiraju, R., Thomas, S., & McGirr, K. (2017). Are there differences in the mental health status of adolescents in Puducherry? *Asian Journal of Psychiatry*, 27, 32–39. <https://doi.org/10.1016/j.ajp.2017.02.011>
- Diederichs, P. C., Atkinson, M. J., Garbett, K. M., & Leckie, G. (2021). Evaluating the “Dove Confident Me” five-session body image intervention delivered by teachers in schools: A cluster randomized controlled effectiveness trial. *Journal of Adolescent Health*, 68(2), 331–341. <https://doi.org/10.1016/j.jadohealth.2020.10.001>
- Diederichs, P. C., Atkinson, M. J., Steer, R. J., Garbett, K. M., Rumsey, N., & Halliwell, E. (2015). Effectiveness of a brief school-based body image intervention ‘Dove Confident Me: Single Session’ when delivered by teachers and researchers: Results from a cluster randomised controlled trial. *Behaviour Research and Therapy*, 74, 94–104. <https://doi.org/10.1016/j.brat.2015.09.004>
- Dohnt, H. K., & Tiggemann, M. (2008). Promoting positive body image in young girls: An evaluation of ‘Shapesville’. *European Eating Disorders Review*, 16(3), 222–233. <https://doi.org/10.1002/erv.814>
- Donner, A., & Klar, N. (2000). *Design and Analysis of Cluster Randomization Trials in Health Research*. London, United Kingdom: Arnold.
- Eldridge, S. M., Lancaster, G. A., Campbell, M. J., Thabane, L., Hopewell, S., Coleman, C. L., & Bond, C. M. (2016). Defining feasibility and pilot studies in preparation for randomised controlled trials: Development of a conceptual framework. *PLoS One*, 11(3), Article e0150205. <https://doi.org/10.1371/journal.pone.0150205>
- Erling, A., & Hwang, C. P. (2004). Body-esteem in Swedish 10-year-old children. *Perceptual and Motor Skills*, 99(2), 437–444. <https://doi.org/10.2466/pms.99.2.437-444>
- Fairburn, C. G., & Wilson, G. T. (1993). *Binge Eating: Nature, Assessment, and Treatment*. New York, NY: Guilford Press.
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1), 80–92. <https://doi.org/10.1177/160940690600500107>
- Frederick, D. A., Crerand, C. E., Brown, T. A., Perez, M., Best, C. R., Cook-Cottone, C. P., & Murray, S. B. (2022). Demographic predictors of body image satisfaction: The US Body Project I. *Body Image*, 41, 17–31. <https://doi.org/10.1016/j.bodyim.2022.01.011>
- Ganesan, S., Ravishankar, S., & Ramalingam, S. (2018). Are body image issues affecting our adolescents? A cross-sectional study among college going adolescent girls. *Indian Journal of Community Medicine*, 43(Suppl 1), S42. [https://doi.org/10.4103/ijcm.IJCM\\_62\\_18](https://doi.org/10.4103/ijcm.IJCM_62_18)
- Garbett, K. M., Lewis-Smith, H., Chaudhry, A., Shroff, H., Dhillon, M., White, P., & Diederichs, P. C. (2021a). Acceptability and preliminary efficacy of a school-based body image intervention in urban India: A pilot randomised controlled trial. *Body Image*, 37, 282–290. <https://doi.org/10.1016/j.bodyim.2021.02.011>
- Garbett, K. M., Lewis-Smith, H., Chaudhry, A., Ugluk-Marucha, N., Vitoratou, S., Shroff, H., & Diederichs, P. C. (2021b). Cultural adaptation and validation of the Body Esteem Scale for Adults and Adolescents for use in English among adolescents in urban India. *Body Image*, 37, 246–254. <https://doi.org/10.1016/j.bodyim.2021.02.012>
- Gattario, K. H., Frisén, A., Fuller-Tyszkiewicz, M., Ricciardelli, L. A., Diederichs, P. C., Yager, Z., & Smolak, L. (2015). How is men's conformity to masculine norms



- related to their body image? Masculinity and muscularity across Western countries. *Psychology of Men & Masculinity*, 16(3), 337. <https://doi.org/10.1037/a0038494>
- Giagazoglou, P., & Papadaniil, M. (2018). Effects of a storytelling program with drama techniques to understand and accept intellectual disability in students 6-7 years old. A pilot study. *Advances in Physical Education*, 8(2), 224–237. <https://doi.org/10.4236/ape.2018.82020>
- Gómez-Lugo, M., Espada, J. P., Morales, A., Marchal-Bertrand, L., Soler, F., & Vallejo-Medina, P. (2016). Adaptation, validation, reliability and factorial equivalence of the Rosenberg Self-Esteem Scale in Colombian and Spanish population. *The Spanish Journal of Psychology*, 19. <https://doi.org/10.1017/sjp.2016.67>
- Greif, R., Becker, C. B., & Hildebrandt, T. (2015). Reducing eating disorder risk factors: A pilot effectiveness trial of a train-the-trainer approach to dissemination and implementation. *International Journal of Eating Disorders*, 48(8), 1122–1131. <https://doi.org/10.1002/eat.22442>
- Guse, T., & van Zyl, C. J. (2021). The PANAS-C: A cross-cultural examination among South African adolescents. *Current Psychology*, 40, 523–533. <https://doi.org/10.1007/s12144-018-9965-9>
- Hennink, M. M., Kaiser, B. N., & Marconi, V. C. (2017). Code saturation versus meaning saturation: How many interviews are enough? *Qualitative Health Research*, 27(4), 591–608. <https://doi.org/10.1177/1049732316665344>
- Hochgraf, A. K., McHale, S. M., & Fosco, G. M. (2018). Parent responsiveness and gender moderate bidirectional links between self-esteem and weight concerns during adolescence. *Journal of Family Psychology*, 32(6), 828–834. <https://doi.org/10.1037/fam0000434>
- Hopkins, E. J., & Weisberg, D. S. (2017). The youngest readers' dilemma: A review of children's learning from fictional sources. *Developmental Review*, 43, 48–70. <https://doi.org/10.1016/j.dr.2016.11.001>
- Hutchison, D., & Styles, B. (2010). *A guide to running randomised controlled trials for educational researchers*: NFER Slough.
- Ingrand, I., Verneau, A., Silvain, C., & Beauchant, M. (2004). Prevention of viral hepatitis C: Assessment of a comic strip-based information campaign targeting adolescents. *The European Journal of Public Health*, 14(2), 147–150. <https://doi.org/10.1093/eurpub/14.2.147>
- Islam, K. M. M., & Asadullah, M. N. (2018). Gender stereotypes and education: A comparative content analysis of Malaysian, Indonesian, Pakistani and Bangladeshi school textbooks. *PLoS One*, 13(1), Article e0190807. <https://doi.org/10.1371/journal.pone.0190807>
- Jackson, T., & Chen, H. (2010). Factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) among adolescent boys in China. *Body Image*, 7(4), 349–355. <https://doi.org/10.1016/j.bodyim.2010.07.003>
- Jakhar, J., 2022. Mental health budget in 2022–23: The is hope, but the mind craves for more. Indian Times: Economic Times. Retrieved from (<https://government.economicstimes.indiatimes.com/news/healthcare/mental-health-budget-in-2022-23-there-is-hope-but-the-mind-craves-for-more/89422592>).
- Jankauskiene, R., Mieziene, B., & Balciuniene, V. (2016). Validation of the Lithuanian version of the Sociocultural Attitudes Towards Appearance Questionnaire-3. *Social Behavior and Personality: An International Journal*, 44(10), 1585–1599. <https://doi.org/10.2224/sbp.2016.44.10.1585>
- Johnson, A. R., Balasubramanya, B., & Britto, R. D. (2015). Body image perception and nutritional status of adolescents in a school in rural South India. *Journal of Indian Association for Child & Adolescent Mental Health*, 11(4), 260–278.
- Kakati, R. P., & Ahmed, S. (2016). Socio-economic classification and its scope in crafting rural segments. *ASEAN Marketing Journal*, 119–138. <https://doi.org/10.21002/amj.v7i2.5474>
- Kanyamee, M., Fongkaew, W., Chotibang, J., Aree, P., & Kennedy, C. (2013). An intervention study of changing eating behaviors and reducing weight in Thai children aged 10–12. *Pacific Rim International Journal of Nursing Research*, 17(4), 317–328.
- Katz, M. L., Oldach, B. R., Goodwin, J., Reiter, P. L., Ruffin, M. T., & Paskett, E. D. (2014). Development and initial feedback about a human papillomavirus (HPV) vaccine comic book for adolescents. *Journal of Cancer Education*, 29(2), 318–324. <https://doi.org/10.1007/s13187-013-0604-8>
- Kazdin, A. E. (2019). Annual research review: Expanding mental health services through novel models of intervention delivery. *Journal of Child Psychology and Psychiatry*, 60(4), 455–472. <https://doi.org/10.1111/jcpp.12937>
- Keery, H., Van den Berg, P., & Thompson, J. K. (2004). An evaluation of the Tripartite Influence Model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image*, 1(3), 237–251. <https://doi.org/10.1016/j.bodyim.2004.03.001>
- Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., & Rahman, A. (2011). Child and adolescent mental health worldwide: Evidence for action. *The Lancet*, 378(9801), 1515–1525. [https://doi.org/10.1016/S0140-6736\(11\)60827-1](https://doi.org/10.1016/S0140-6736(11)60827-1)
- Kilpela, L. S., Hill, K., Kelly, M. C., Elmquist, J., Ottoson, P., Keith, D., & Becker, C. B. (2014). Reducing eating disorder risk factors: A controlled investigation of a blended task-shifting/train-the-trainer approach to dissemination and implementation. *Behaviour Research and Therapy*, 63, 70–82. <https://doi.org/10.1016/j.brat.2014.09.005>
- Kovacs, F., Oliver-Frontera, M., Plana, M. N., Royuela, A., Muriel, A., Gestoso, M., & Network, S. B. P. R. (2011). Improving schoolchildren's knowledge of methods for the prevention and management of low back pain: A cluster randomized controlled trial. *Spine*, 36(8), E505–E512. <https://doi.org/10.1097/BRS.0b013e3181dcccbe>
- Laurent, J., Catanzaro, S. J., Joiner, T. E., Jr., Rudolph, K. D., Potter, K. I., Lambert, S., & Gathright, T. (1999). A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment*, 11(3), 326–338. <https://doi.org/10.1037/1040-3590.11.3.326>
- Leung, M. M., Tripicchio, G., Agaronov, A., & Hou, N. (2014). Manga comic influences snack selection in Black and Hispanic New York City youth. *Journal of Nutrition Education and Behavior*, 46(2), 142–147. <https://doi.org/10.1016/j.jneb.2013.11.004>
- Leung, M. M., Green, M. C., Tate, D. F., Cai, J., Wyka, K., & Ammerman, A. S. (2017). Fight for your right to fruit: Psychosocial outcomes of a manga comic promoting fruit consumption in middle-school youth. *Health Communication*, 32(5), 533–540. <https://doi.org/10.1080/10410236.2016.1211074>
- Lewis-Smith, H., Bray, I., Salmon, D., & Slater, A. (2020). Prospective pathways to depressive symptoms and disordered eating in adolescence: A 7-year longitudinal cohort study. *Journal of Youth and Adolescence*, 49(10), 2060–2074. <https://doi.org/10.1007/s10964-020-01291-1>
- Lewis-Smith, H., Garbett, K., Chaudhry, A., Uglik-Marucha, N., Vitoratou, S., Dhillon, M., & Diedrichs, P. (2021b). Adaptation and validation of the Internalisation-General subscale of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3) in English among urban Indian adolescents. *Body Image*, 36, 254–262. <https://doi.org/10.1016/j.bodyim.2020.12.004>
- Lewis-Smith, H., Garbett, K. M., Chaudhry, A., Uglik-Marucha, N., Vitoratou, S., Dhillon, M., & Diedrichs, P. C. (2021a). Adaptation and validation of the Eating Disorder Examination-Questionnaire in English among urban Indian adolescents. *International Journal of Eating Disorders*, 54(2), 187–202. <https://doi.org/10.1002/eat.23431>
- Lewis-Smith, H., Garbett, K., Chaudhry, A., Dhillon, M., Shroff, M., White, P., & Diedrichs, P. (2021b). Evaluating a culturally-adapted evidence-based body image school intervention, 'Confident Me,' in India: A randomised controlled trial.
- Liu, C., & Elms, P. (2019). Animating student engagement: The impacts of cartoon instructional videos on learning experience. *Research in Learning Technology*, 27. <https://doi.org/10.25304/rlt.v27.2124>
- Machado, P. P., Martins, C., Vaz, A. R., Conceição, E., Bastos, A. P., & Gonçalves, S. (2014). Eating disorder examination questionnaire: psychometric properties and norms for the Portuguese population. *European Eating Disorders Review*, 22(6), 448–453. <https://doi.org/10.1002/erv.2318>
- MacQueen, K. M., McLellan, E., Kay, K., & Milstein, B. (1998). Codebook development for team-based qualitative analysis. *Cultural Anthropology Methods*, 10(2), 31–36. <https://doi.org/10.1177/1525822x980100020301>
- Maezono, J., Hamada, S., Sillanmäki, L., Kaneko, H., Ogura, M., Lempinen, L., & Sourander, A. (2019). Cross-cultural, population-based study on adolescent body image and eating distress in Japan and Finland. *Scandinavian Journal of Psychology*, 60(1), 67–76. <https://doi.org/10.1111/sjop.12485>
- Math, S. B., Gowda, G. S., Basavaraju, V., Manjunatha, N., Kumar, C. N., Enara, A., & Thirthalli, J. (2019). Cost estimation for the implementation of the Mental Healthcare Act 2017. *Indian Journal of Psychiatry*, 61(Suppl 4), S650.
- Matsuzono, K., Yokota, C., Takekawa, H., Okamura, T., Miyamatsu, N., Nakayama, H., & Okumura, K. (2015). Effects of stroke education of junior high school students on stroke knowledge of their parents: Tochigi project. *Stroke*, 46(2), 572–574. <https://doi.org/10.1161/STROKEAHA.114.007907>
- McLain, K. (2009). *India's Immortal Comic Books: Gods, Kings, and Other Heroes*. Indiana University Press.
- McLean, S. A., Paxton, S. J., & Wertheim, E. H. (2016). The role of media literacy in body dissatisfaction and disordered eating: A systematic review. *Body Image*, 19, 9–23. <https://doi.org/10.1016/j.bodyim.2016.08.002>
- Mendelson, B. K., Mendelson, M. J., & White, D. R. (2001). Body-esteem scale for adolescents and adults. *Journal of Personality Assessment*, 76(1), 90–106. [https://doi.org/10.1207/S15327752JPA7601\\_6](https://doi.org/10.1207/S15327752JPA7601_6)
- Michaelides, M. P., Zenger, M., Koutsogiorgi, C., Brähler, E., Stöbel-Richter, Y., & Berth, H. (2016). Personality correlates and gender invariance of wording effects in the German version of the Rosenberg Self-Esteem Scale. *Personality and Individual Differences*, 97, 13–18. <https://doi.org/10.1016/j.paid.2016.03.011>
- Mickel, C. F., Shanovich, K. K., Evans, M. D., & Jackson, D. J. (2017). Evaluation of a school-based asthma education protocol: Iggy and the inhalers. *The Journal of School Nursing*, 33(3), 189–197. <https://doi.org/10.1177/1059840516659912>
- Mills, A., & Osborn, B. (2013). *Shapesville, Vol. 1. Gurze Books*.
- Mills, J., & Fuller-Tyszkiewicz, M. (2017). Fat talk and body image disturbance: A systematic review and meta-analysis. *Psychology of Women Quarterly*, 41(1), 114–129. <https://doi.org/10.1177/0361684316675317>
- Mills, M. J., Culbertson, S. S., Huffman, A. H., & Connell, A. R. (2012). Assessing gender biases: Development and initial validation of the gender role stereotypes scale. *Gender in Management: An International Journal*, 27(8), 520–540. <https://doi.org/10.1108/17542411211279715>
- Moehlecke, M., Blume, C. A., Cureau, F. V., Kieling, C., & Schaan, B. D. (2020). Self-perceived body image, dissatisfaction with body weight and nutritional status of Brazilian adolescents: A nationwide study. *Journal de Pediatria*, 96, 76–83. <https://doi.org/10.1016/j.jpedp.2018.11.009>
- Mohr, D. C., Spring, B., Freedland, K. E., Beckner, V., Areal, P., Hollon, S. D., & Kaplan, R. (2009). The selection and design of control conditions for randomized controlled trials of psychological interventions. *Psychotherapy and Psychosomatics*, 78(5), 275–284. <https://doi.org/10.1159/000228248>
- Mondal, T., Ghosh, R., Maji, S., & Ray, T. G. (2021). Correlates of body image perception and dietary practices among urban adolescents—experience from government schools in Kolkata City. *Annals of Community Health*, 9(1), 278–285.
- Mousazadeh, S., Rakhshan, M., & Mohammadi, F. (2017). Investigation of content and face validity and reliability of Sociocultural Attitude Towards Appearance Questionnaire-3 (SATAQ-3) among female adolescents. *Iranian Journal of Psychiatry*, 12(1), 15.
- Musa, R., Bujang, M., Haniff, J., Mohamad, N., Kd, O., & Radeef, A. (2016). Norms for Eating Disorder Examination Questionnaire (EDE-Q) among secondary school students in Kuala Lumpur, Malaysia. *IJUM Medical Journal Malaysia*, 15(2), <https://doi.org/10.31436/imjm.v15i2.390>
- Nagata, J. M., Domingue, B. W., Darmstadt, G. L., Weber, A. M., Meausoone, V., Cislaghi, B., & Shakya, H. B. (2020). Gender norms and weight control behaviors in US adolescents: A prospective cohort study (1994–2002). *Journal of Adolescent Health*, 66(1), S34–S41. <https://doi.org/10.1016/j.jadohealth.2019.08.020>
- Naik, G., Chitre, C., Bhalla, M., & Rajan, J. (2020). Impact of use of technology on student learning outcomes: Evidence from a large-scale experiment in India.

- World Development, 127, Article 104736. <https://doi.org/10.1016/j.worlddev.2019.104736>
- Obare, F., Birungi, H., Deacon, B., & Burnet, R. (2013). Effectiveness of using comic books to communicate HIV and AIDS messages to in-school youth: Insights from a pilot intervention study in Nairobi, Kenya. *African Population Studies*, 27(2), 203–215. <https://doi.org/10.11564/27-2-441>
- Olenik-Shemesh, D., & Heiman, T. (2017). Cyberbullying victimization in adolescents as related to body esteem, social support, and social self-efficacy. *The Journal of Genetic Psychology*, 178, 28–43.
- Ortuño-Sierra, J., Bañuelos, M., Pérez de Albéniz, A., Molina, B. L., & Fonseca-Pedrero, E. (2019). The study of positive and negative affect in children and adolescents: new advances in a Spanish version of the PANAS. *PLoS One*, 14(8), Article e0221696. <https://doi.org/10.1371/journal.pone.0221696>
- Pande, R. P., & Astone, N. M. (2007). Explaining son preference in rural India: the independent role of structural versus individual factors. *Population Research and Policy Review*, 26(1), 1–29. <https://doi.org/10.1007/s11113-006-9017-2>
- Papp, I., Urbán, R., Czeglédi, E., Babusa, B., & Túry, F. (2013). Testing the Tripartite Influence Model of body image and eating disturbance among Hungarian adolescents. *Body Image*, 10(2), 232–242. <https://doi.org/10.1016/j.bodyim.2012.12.006>
- Parameswaran, R., & Cardoza, K. (2009). Melanin on the margins: Advertising and the cultural politics of fair/light/white beauty in India. *Journalism & Communication Monographs*, 11(3), 213–274. <https://doi.org/10.1177/152263790901100302>
- Parikh, R., Michelson, D., Sapru, M., Sahu, R., Singh, A., Cuijpers, P., & Patel, V. (2019). Priorities and preferences for school-based mental health services in India: A multi-stakeholder study with adolescents, parents, school staff, and mental health providers. *Global Mental Health*, 6. <https://doi.org/10.1017/gmh.2019.16>
- Pasricha, R., Mitra, R., & Whitehead, S. (2018). Challenging gendered realities with transmedia for Indian adolescents. *The Journal of Development Communication*, 29(1), 81–100. (<http://jdc.journals.unisel.edu.my/ojs/index.php/jdc/article/view/72>)
- Patel, S. K., Santhya, K. G., & Haberland, N. (2021). What shapes gender attitudes among adolescent girls and boys? Evidence from the UDAYA Longitudinal Study in India. *PLoS one*, 16(3), Article e0248766. <https://doi.org/10.1371/journal.pone.0248766>
- Patel, V., Flisher, A. J., Hetrick, S., & McGorry, P. (2007). Mental health of young people: a global public-health challenge. *The Lancet*, 369(9569), 1302–1313. [https://doi.org/10.1016/S0140-6736\(07\)60368-7](https://doi.org/10.1016/S0140-6736(07)60368-7)
- Peltzer, K., Pengpid, S., & James, C. (2016). The globalization of whitening: Prevalence of skin lighteners (or bleachers) use and its social correlates among university students in 26 countries. *International Journal of Dermatology*, 55(2), 165–172. <https://doi.org/10.1111/ijd.12860>
- Penelo, E., Negrete, A., Portell, M., & Raich, R. M. (2013). Psychometric properties of the Eating Disorder Examination Questionnaire (EDE-Q) and norms for rural and urban adolescent males and females in Mexico. *PLoS one*, 8(12), Article e83245. <https://doi.org/10.1371/journal.pone.0083245>
- Phadke, S. (2017). *How to Do Feminist Mothering in Urban India? Some Reflections on the Politics of Beauty and Body Shapes. Aesthetic Labour*. Springer, 247–261.
- Pulerwitz, J., & Barker, G. (2008). Measuring attitudes toward gender norms among young men in Brazil: Development and psychometric evaluation of the GEM scale. *Men and Masculinities*, 10(3), 322–338. <https://doi.org/10.1177/1097184x06298778>
- Rodgers, R. F., McLean, S. A., & Paxton, S. J. (2015). Longitudinal relationships among internalization of the media ideal, peer social comparison, and body dissatisfaction: Implications for the tripartite influence model. *Developmental Psychology*, 51(5), 706. <https://doi.org/10.1037/dev0000013>
- Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). *Acceptance and Commitment Therapy. Measures Package*, 61(52), 18.
- Sawitri, D. R., Creed, P. A., & Zimmer-Gembeck, M. J. (2014). Parental influences and adolescent career behaviours in a collectivist cultural setting. *International Journal for Educational and Vocational Guidance*, 14(2), 161–180. <https://doi.org/10.1007/s10775-013-9247-x>
- Schmitt, D. P., & Allik, J. (2005). Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: Exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology*, 89(4), 623. <https://doi.org/10.1037/0022-3514.89.4.623>
- Shagar, P. S., Donovan, C. L., Loxton, N., Boddy, J., & Harris, N. (2019). Is thin in everywhere?: A cross-cultural comparison of a subsection of Tripartite Influence Model in Australia and Malaysia. *Appetite*, 134, 59–68. <https://doi.org/10.1016/j.appet.2018.12.025>
- Sharpe, H., Patalay, P., Choo, T. H., Wall, M., Mason, S. M., Goldschmidt, A. B., & Neumark-Sztainer, D. (2018). Bidirectional associations between body dissatisfaction and depressive symptoms from adolescence through early adulthood. *Development and Psychopathology*, 30(4), 1447–1458. <https://doi.org/10.1017/S0954579417001663>
- Shroff, H., & Thompson, J. K. (2006). The tripartite influence model of body image and eating disturbance: A replication with adolescent girls. *Body Image*, 3(1), 17–23. <https://doi.org/10.1016/j.bodyim.2005.10.004>
- Singh, M., Parsekar, S. S., & Bhumika, T. (2016). Body image, eating disorders and role of media among Indian adolescents. *Journal of Indian Association for Child & Adolescent Mental Health*, 12(1), 9–35.
- Sinha, I., Patel, A., Kim, F. S., MacCorkle, M. L., & Watkins, J. F. (2011). Comic books can educate children about burn safety in developing countries. *Journal of Burn Care & Research*, 32(4), e112–e117. <https://doi.org/10.1097/BCR.0b013e3182223c6f>
- Soohinda, G., Mishra, D., Sampath, H., & Dutta, S. (2019). Body dissatisfaction and its relation to Big Five personality factors and self-esteem in young adult college women in India. *Indian Journal of Psychiatry*, 61(4), 400. [https://doi.org/10.4103/psychiatry.IndianJPsychiatry\\_367\\_18](https://doi.org/10.4103/psychiatry.IndianJPsychiatry_367_18)
- Soohinda, G., Sampath, H., Mishra, D., & Dutta, S. (2020). Body image dissatisfaction in young Indian Men: Prevalence, psychosocial correlates, and the impact of socio-cultural pressure. *Indian Journal of Social Psychiatry*, 36(2), 130. [https://doi.org/10.4103/ijsp.ijsp\\_28\\_19](https://doi.org/10.4103/ijsp.ijsp_28_19)
- Spiegel, A. N., McQuillan, J., Halpin, P., Matuk, C., & Diamond, J. (2013). Engaging teenagers with science through comics. *Research in Science Education*, 43(6), 2309–2326. <https://doi.org/10.1007/s11165-013-9358-x>
- Stefanile, C., Matera, C., Nerini, A., & Pisani, E. (2011). Validation of an Italian version of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) on adolescent girls. *Body Image*, 8(4), 432–436. <https://doi.org/10.1016/j.bodyim.2011.06.001>
- Swami, V., & Barron, D. (2019). Translation and validation of body image instruments: Challenges, good practice guidelines, and reporting recommendations for test adaptation. *Body Image*, 31, 204–220. <https://doi.org/10.1016/j.bodyim.2018.08.014>
- Swami, V., Frederick, D. A., Aavik, T., Alcalay, L., Allik, J., Anderson, D., & Cunningham, J. (2010). The attractive female body weight and female body dissatisfaction in 26 countries across 10 world regions: Results of the International Body Project I. *Personality and Social Psychology Bulletin*, 36(3), 309–325. <https://doi.org/10.1177/0146167209359702>
- Thompson, J. K., van den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. *International Journal of Eating Disorders*, 35(3), 293–304. <https://doi.org/10.1002/eat.10257>
- Tisdell, C. (2002). Gender Inequality in India: evidence from a survey in rural West Bengal. *International Journal of Social Economics*. <https://doi.org/10.1108/03068290210438040>
- Torres, S., Vieira, F.M., Magalhães, C., Campos, M., & Barbosa, R. (2018). *Expanding the evidence-base of "Dove, Confident Me" programme: Preliminary results of an effectiveness trial in Portugal*. Paper presented at the Appearance Matters 8, Bath, UK. (<https://doi.org/10.1016/j.bodyim.2021.02.011>)
- Tsimpli, I. M., Vogelzang, M., Balasubramanian, A., Marinis, T., Alladi, S., Reddy, A., & Panda, M. (2020). Linguistic diversity, multilingualism, and cognitive skills: A study of disadvantaged children in India. *Languages*, 5(1), 10. <https://doi.org/10.3390/languages5010010>
- United Nations. Department of Economic and Social Affairs, P. D. (2019). Retrieved from ([https://population.un.org/wpp/Publications/Files/WPP2019\\_Highlights.pdf](https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf))
- Upadhyay, R. K., & Hasnain, S. I. (2017). Linguistic diversity and biodiversity. *Lingua*, 195, 110–123. <https://doi.org/10.1016/j.lingua.2017.06.002>
- Valiente, C., Swanson, J., DeLay, D., Fraser, A. M., & Parker, J. H. (2020). Emotion-related socialization in the classroom: Considering the roles of teachers, peers, and the classroom context. *Developmental Psychology*, 56(3), 578–594. <https://doi.org/10.1037/dev0000863>
- Van den Berg, P., Thompson, J. K., Obremski-Brandon, K., & Coovert, M. (2002). The Tripartite Influence model of body image and eating disturbance: A covariance structure modeling investigation testing the mediational role of appearance comparison. *Journal of Psychosomatic Research*, 53(5), 1007–1020. [https://doi.org/10.1016/S0022-3999\(02\)00499-3](https://doi.org/10.1016/S0022-3999(02)00499-3)
- Waghachavare, V. B., Quraishi, S. R., Dhumble, G. B., & Gore, A. D. (2014). A cross-sectional study of correlation of body image anxiety with social phobia and their association with depression in the adolescents from a rural area of Sangli District in India. *International Journal of Preventive Medicine*, 5(12), 1626.
- Willis, L. A., Kachur, R., Castellanos, T. J., Nichols, K., Mendoza, M. C., Gaul, Z. J., & LaPlace, L. (2018). Developing a Motion Comic for HIV/STD Prevention for Young People Ages 15–24, Part 2: Evaluation of a Pilot Intervention. *Health Communication*, 33(3), 229–237. <https://doi.org/10.1080/10410236.2016.1255841>
- World Health Organization (2021). WHO menu of cost-effective interventions for mental health. Retrieved from (<https://apps.who.int/iris/bitstream/handle/10665/343074/9789240031081-eng.pdf>)
- Wróbel, M., Finogenow, M., Szymańska, P., & Laurent, J. (2019). Measuring positive and negative affect in a school-based sample: a polish version of the PANAS-C. *Journal of Psychopathology and Behavioral Assessment*, 41(4), 598–611. <https://doi.org/10.1007/s10862-019-09720-7>
- Yager, Z., Diedrichs, P. C., Ricciardelli, L. A., & Halliwell, E. (2013). What works in secondary schools? A systematic review of classroom-based body image programs. *Body Image*, 10(3), 271–281. <https://doi.org/10.1016/j.bodyim.2013.04.001>
- Zeyneloglu, S., & Terzioglu, F. (2011). Development and psychometric properties gender roles attitude scale. *Hacettepe Universitesi Eğitim Fakültesi Dergisi*, 40(4), 409–420.