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Changes in Body Mass Index during the COVID-19 Pandemic among Indonesian Adolescents: The Role of Sex, Urban Area, Baseline BMI, and Appetitive Traits

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Keywords
COVID-19 · Standardized body mass index · Emotional overeating · Food responsiveness · Sex · Urban/suburban area

Abstract
Introduction: Little is known about how the COVID-19 situation affected weight development among Indonesian adolescents. This longitudinal study examined whether, and for whom, the COVID-19 situation affected weight outcomes over time among adolescents from private schools and higher socio-economic positions in Indonesia, where being overweight is a rather prevalent characteristic. This study specifically examined whether appetitive traits (i.e., emotional overeating, food responsiveness) as well as baseline zBMI, sex, and urban area could explain changes in zBMI. ***Methods:*** At baseline, 411 adolescents from 5 private schools in Indonesia (53.3% males, M_{age} = 12.02 years, SD = 0.45) filled out questionnaires on appetitive traits and background characteristics. In addition, their height and weight were measured. Of these, 336 adolescents (81.8%) also participated at follow-up. At follow-up, height and weight were measured or reported. We used linear regression to analyze the association between predictors and interactions with zBMI. ***Results:*** The results showed a significant decrease in zBMI over time, with a lower average zBMI during COVID-19 compared to before COVID-19. Female adolescents and adolescents with higher baseline zBMI values particularly tended to show this zBMI decreasing pattern. We did not find statistically significant main effects of baseline emotional overeating, food responsiveness, and urban area or any interactions. ***Conclusions:*** Indonesian adolescents appeared to decrease in terms of zBMI during COVID-19, particularly females and adolescents with higher pre-COVID-19 zBMI. Our findings suggest that (culturally-specific) contextual changes (i.e., less exposure to the Indonesian food environment at schools and more exposure to the home environment) might have a beneficial impact in terms of preventing overweight among Indonesian adolescents, particularly among those being more vulnerable (i.e., having higher baseline zBMI).

Introduction

In Indonesia, obesity or overweight is more prevalent in high socio-economic position (SEP) groups and often tend to be perceived as a sign of affluence in a family [1,

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2]. Adolescence is a particularly vulnerable period for the development of overweight, with changes in adolescence typically affecting weight development in adulthood [3]. In 2020, the COVID-19 pandemic required many people to stay at home worldwide. In Indonesia, there were two lockdown periods. The first was from March to August 2020 and the second was from July to December 2021 [4, 5]. During these lockdowns, Indonesian governments implemented several restriction measures (i.e., closed all learning institutions and public facilities, such as restaurants, sport facilities, and cinemas) to suppress the community spread of COVID-19. In Indonesia, schools remained closed for almost 2 years (from March 2020 to January 2022), and adolescents spent most of their time at home.

The lockdown period restricted the number of hours permitted for outdoor activities. During the lockdown, the intake of sweets and snacks consumption increased among adolescents in Western countries and Indonesia [6–8], while energy expenditure through physical activity generally decreased [9–12]. Given that weight development is most importantly affected by changes in (the balance between) energy intake and expenditure, it is not surprising that previous studies have found weight increases among children and adolescents [7, 13–16]. However, most of these studies were performed among Western countries. One study among Indonesian university students also suggest that these students appear to gain weight during COVID-19 [17]. Two studies conducted before the pandemic among Indonesian adolescents reported that the prevalence of overweight increased and that adolescents had a tendency to increase weight [18, 19]. To the best of our knowledge, there are no longitudinal studies among Indonesian adolescents on this topic during the COVID-19 situation. Our study aimed to fill this gap.

Understanding who is more or less vulnerable to weight increase during the pandemic is critical to further target public health interventions. Previous studies in Western countries have generally shown that adolescents with overweight or higher pre-pandemic weight values tend to have a higher risk at weight increases during COVID-19 compared to non-overweight adolescents or adolescents with lower pre-pandemic weight values [15, 20]. One potential explanation as to why some adolescents maintain a healthy weight while others (potentially with higher initial weight) gain weight is provided by the behavioral susceptibility model [21]. This model suggests that inherited traits (e.g., appetitive traits) interact with environmental factors (e.g., contextual changes due to COVID-19 pandemic) to attenuate overweight risk [22]. Appetitive traits are defined as a set of persistent (also genetically determined) predispositions toward food. This study focused on food responsiveness and emotional overeating as higher scores on these appetitive traits are closely associated with higher weight characteristics [22–25]. During the lockdown, adolescents may have been exposed to more food cues between meals at home (e.g., snacks being easily available). From previous studies in Western countries, we also know that many parents were more permissive toward food and more frequently bought unhealthy food products [26, 27]. As such, adolescents with higher food responsiveness might have been more vulnerable to these contextual food-related lockdown changes. Aside from external cues, emotions are often regarded as internal stimuli that may also influence eating decisions. During the lockdown, negative emotions were more common [28]. As such, it is not surprising that previous studies found that adolescents with higher emotional overeating tendencies were particularly more vulnerable to eat more in confrontation with these negative emotions (i.e., stress, boredom, anxiety) during COVID-19 [29, 30]. However, previous studies on the "effects" of appetitive traits have been performed in Western countries and were limited by cross-sectional designs. Additional research in Asian countries, such as Indonesia, is needed to increase insight into the link between appetitive traits, before COVID-19 zBMI, and subsequent weight development during COVID-19.

Moreover, before COVID-19 (i.e., at baseline), one of our previous studies found that male Indonesian adolescents in urban school areas had a higher risk of having an overweight status [31]. Given that school area closely aligns with the home area, adolescent males living in these urban areas may also be more vulnerable for weight gain during COVID-19. Previous studies have similarly reported about sex and urban areas as potential predictors of zBMI among children and adolescents in Indonesia [1, 32]. As such, the current longitudinal study will also examine whether male adolescents from urban areas are the ones showing an increase in zBMI during COVID-19, particularly in combination with higher baseline zBMI or specific appetitive vulnerability (i.e., food responsiveness and emotional overeating).

To conclude, in this study we examined whether, and for whom, the COVID-19 situation affected changes in zBMI among Indonesian adolescents from higher SEP backgrounds. Our aims were twofold. First, we aimed to examine mean-level differences in zBMI before and during COVID-19. We expected that on average adolescent zBMI during COVID-19 would increase compared to before COVID-19 (hypothesis 1). Second, we

examined whether sex, urban area, baseline zBMI, and appetitive traits (i.e., emotional overeating and food responsiveness) explained changes in zBMI over time (while controlling for baseline zBMI). We expected all five main effects to have positive and significant associations with more zBMI increasing during COVID-19 (hypothesis 2). In addition, we also expected that particularly males in urban area would show the largest increases in zBMI during COVID-19 (i.e., sex x area), particularly in combination with baseline zBMI and appetitive trait vulnerability (i.e., sex x area x emotional overeating, sex x area x food responsiveness, sex x area x baseline zBMI; hypothesis 3).

Methods

The procedures, hypotheses, and analytic plan for this paper were uploaded as preregistration on the Open Science Framework (https://osf.io/kh5yb/).

Procedure and Participants

This study has been performed in Indonesia and is part of a larger longitudinal project. For this study, wave 1 (October – December 2019) and wave 3 (June – September 2021) data were used. Both waves took place in the same five private schools as our previous study [31]. As we did not have objective measures of weight and height available for wave 2, and because this measurement was at the beginning of the COVID-19 period (not enough time passed to impact weight development), we decided to use the wave 1 (baseline or pre-pandemic) and wave 3 measurements (during COVID-19) for which (partly) objective measures of weight and height were available. Adolescents filled out questionnaires. Moreover, height and weight were measured in wave 1 by school nurses and trained researcher assistants for all participants. In wave 3, although schools were closed and students studied at home, some of the teachers and employees worked at school sporadically. Two schools managed to ask students to come to school while following the protocols. As such, the height and weight of participants could be measured by school nurses at these schools. However, for the other schools the weight and height values were either reported by adolescents themselves or by parents after measuring children's weight and height at home (see measurements).

A letter describing the longitudinal project was initially sent to officials of school foundations (some private schools are organized by private foundations) or directly to school officials. If the school foundations provided approval, the agreement letter was sent to the principal of the schools. Schools officially informed both the parents and students about the goals of the project. Parents were asked to return a signed consent form indicating they agreed to their child's participation. Students were also asked to return a signed consent form indicating whether they agreed to participate in the study. Moreover, students were informed that their participation was voluntary, that answers would be processed confidentially and would be stored separately from personal data (with a key file to link the data), and that they could withdraw from the study at any time. During baseline measurement, adolescents completed a paper self-report survey at school during one classroom hour (approximately 60 min). At follow-up, adolescents completed an online self-reported survey from their home during 1 classroom hour.

Of the five schools that agreed to participate, three schools obtained active consent forms from parents and students. The remaining two schools, based on the school policy, informed the parents about this project (passive consent) and collected the signed consent forms from students only. The original and amended (passive consent procedures of two schools) were approved by the Ethics Committee Social Science of Radboud University, Nijmegen, The Netherlands (ECSS-2019-115). In total, 438 adolescents participated in both waves, 75 adolescents only participated in wave 1, and 27 only participated in wave 3. At baseline, 411 adolescents participated, 53.3% males (M_{age} = 12.02 years, SD = 0.45). Of these, 336 adolescents (81.8%) also participated at follow-up. We performed a logistic regression analysis to identify potential differences in background characteristics (i.e., adolescents' sex, urban area) and main study variables (i.e., adolescents' appetitive traits and zBMI) between those with missing and complete data at follow-up. The results revealed that attrition was at random for most variables. However, sex and area differed between the completers and those with missing values (for sex: OR = 0.56, 95% CI: 0.34, 0.94; for area: OR = 5.57, 95% CI: 3.19, 9.75), indicating that females and adolescents from nonurban school areas were more likely to drop out.

Measurements

zBMI

Baseline weight and height were measured at school in wave 1. Adolescents' height was measured to the nearest 0.1 cm with a validated stadiometer (Seca 217), and weight was measured to the nearest 0.1 kg with a standardized weighing scale (Seca 840). Although at baseline, all weight measures were taken at school, during COVID-19, weight

and height were objectively measured for some, but not all adolescents, as mentioned. Specifically, the weight of 129 adolescents was objectively measured at school, 70 adolescents provided self-reported weight and height measures, and the height and weight of 164 adolescents was provided by their parents (see participants and procedures). To assess adolescents' zBMI, first adolescents' BMI was computed by dividing their weight in kilograms by their squared height in meters. Subsequently, adolescents' zBMI was computed by considering the age (in months) and sex CDC2000 growth charts (Centers for Disease Control and Prevention [CDC] 2000). The zBMI change was defined according to the difference between both measures of zBMI (zBMI wave 3 – zBMI wave1). As such, a positive zBMI change score thus indicates an increase in zBMI, while a negative score indicates a decrease in zBMI.

Sex and Area

Adolescent's sex was dummy coded, with 0 = female and 1 = male. Area was coded 0 = suburban (Bandung and Manado), 1 = urban area (Jakarta and Surabaya). We divided the area based on modernization and levels of westernization [33].

Appetitive Traits (Emotional Overeating and Food Responsiveness)

Appetitive traits were measured using two subscales (i.e., emotional overeating and food responsiveness) of the Adult Eating Behavior Questionnaires (AEBQ [34]). Participants responded to the items on a five points Likert scale (strongly disagree, disagree, neither disagree nor agree, agree, strongly agree). Emotional overeating was measured with five items. One example item is "I eat more when I am annoyed." The internal consistency was good ($\alpha = 0.86$). Food responsiveness was measured with four items. An example item of food responsiveness is "I often feel hungry when I am with someone who is eating." The reliability of the food responsiveness scale was adequate ($\alpha = 0.74$).

Statistical Analyses

The analyses were performed in R (version 4.0.2 [35]). Pearson correlation coefficients were calculated between pre-pandemic appetitive traits variables (i.e., emotional overeating, food responsiveness), sex, urban area, and both time points zBMI (i.e., baseline and during COVID-19). In the case of two dichotomous variables, we used a chi-square test. To assess mean-level changes in zBMI, we compared baseline zBMI and zBMI during COVID-19 using a dependent samples *t* test. Linear regression analyses were conducted to examine the main effects and interactions between predictors (emotional overeating, food responsiveness, sex, area, and baseline zBMI) of zBMI change. The sem() function in the lavaan package (version 0.6-8 [36]) was used to fit the specified model to the observed data. We applied the Huber-White covariance adjustment ("MLR") to the standards errors of each parameter estimate, to account for the potential non-normality in the residual distribution. Missingness was accounted for using full information maximum likelihood. Two regression analyses were performed. The first analysis included the main effects of emotional overeating, food responsiveness, sex, area, and baseline zBMI as predictors of changes in zBMI. The second analysis included these five main effects, as well as five 2-way interactions (i.e., sex × area, sex × emotional overeating, sex × food responsiveness, area × emotional overeating, area × food responsiveness), and three 3-way interactions (i.e., sex × area × emotional overeating, sex × area × food responsiveness, and sex × area × baseline zBMI) were also tested. Simple slopes analyses were used to probe and interpret statistically significant interactions.

Results

Descriptive Statistics

With regard to the whole sample dataset ($n = 438$), 75.5% of the adolescents participated at both waves (wave 1 and 3). The sample was equally divided according to sex (53.7% males). Table 1 also shows the correlations of all study variables as well as their descriptive statistics. Sex was significantly correlated with zBMI at baseline and during COVID-19 ($r = 0.16$, $p = 0.003$, and $r = 0.20$, $p < 0.001$, respectively), indicating that males had higher zBMI at both time points compared to females. Moreover, a significant negative correlation was found between sex and emotional overeating ($r = -0.17$, $p = 0.002$), indicating that females reported higher levels of emotional overeating compared to males. A significant positive correlation ($r = 0.49$, $p < 0.001$) was found between emotional overeating and food responsiveness, indicating that adolescents with higher emotional overeating also had higher food responsiveness. Finally, school area was positively and (weakly) significantly associated with zBMI at baseline and during COVID-19 ($r = 0.17$, $p = 0.03$, and $r = 0.12$, $p = 0.03$), indicating that adolescents in urban areas (compared to those in suburban areas) showed higher zBMI values at both time points. No other statistically significant correlations were detected.

Table 1. Descriptive statistics and correlation coefficients of study variables

Variables	1	2	3	4	5	6	7
1. zBMI_W1							
2. zBMI_W3	0.94***						
3. zBMI change	−0.41***	−0.08					
4. EOE_W1	−0.00	0.02	0.04				
5. FR_W1	−0.06	−0.04	0.09	0.49***			
6. Sex[a]	0.16**	0.20***	0.06	−0.17**	0.00		
7. Area[b]	0.12*	0.12*	−0.01	0.03	−0.08	0.02	
M	0.52	0.43	−0.08	12.04	11.65		
SD	1.13	1.05	0.39	4.51	3.52		
Range	−3.17 to 2.57	−2.75 to 2.45	−1.44 to 1.50	5–25	4–20		
N	335	330	329	336	336	336	336

zBMI_W1, baseline zBMI; zBMI_W3, zBMI during COVID-19; EOE, emotional overeating; FR, food responsiveness. *p value <0.05. **p value <0.01. ***p value <0.001. [a]Sex is coded as 0 = females; 1 = males. [b]Area is coded as 0 = suburban area; 1 = urban area.

Changes in zBMI during COVID-19

We first compared the differences in mean zBMI between both time points. The mean zBMI during COVID-19 was lower than baseline zBMI (zBMI wave 1: M = 0.52, SD = 1.13, and zBMI wave 3: M = 0.43, SD = 1.04). The dependent-sample t test showed that this mean difference was statistically significant (t [328] = 3.78, p < 0.001). This indicates that adolescents on average had lower zBMI (decreased in zBMI) in the period during COVID-19 compared to before COVID-19. We further explored zBMI changes during COVID-19 by means of multiple linear regression analyses examining main effects, two-way interactions, and three-way interactions (see Table 2). Results from the main effects model showed that baseline zBMI was negatively associated with change in zBMI during COVID-19 (b = −0.14, SE = 0.02, p < 0.001). Given that adolescents lost zBMI on average, this indicates that those with higher initial zBMI showed relatively more of a decrease in zBMI compared to those with lower initial zBMI. We also found that sex was positively associated with change in zBMI during COVID-19 (b = 0.11, SE = 0.04, p = 0.01), indicating that females showed relatively more decreasing zBMI scores during COVID-19 compared to males. In the regression analysis that included the interaction terms, only the main effect of baseline zBMI emerged as statistically significant. No other statistically significant main effects (of area, emotional overeating, food responsiveness) or interactions (between sex and area, sex and area and emotional overeating, sex and area and food responsiveness, sex and area and baseline zBMI) were detected (see Table 2). The main effect model explained 20.2%, and the total model (i.e., main effect and interactions) explained 22% of the variance in zBMI change.

Discussion

The main aim of the current study was twofold. First, we examined average differences in zBMI by comparing before and during COVID-19 zBMI values. Second, we examined main effects and specific (combinations of) predictors of changes in zBMI during COVID-19 among adolescents in Indonesia (i.e., baseline zBMI, appetitive traits, sex, urban area, and interaction effects). We found that Indonesian adolescents had, on average, a lower zBMI during COVID-19 compared to pre-COVID-19. Moreover, we found that adolescents with higher initial zBMI showed a relatively higher decrease in zBMI compared to adolescents with lower initial zBMI values. We also found that female adolescents showed more zBMI decreasing patterns during COVID-19 compared to males. None of the other variables or interactions between variables were significant. These findings will be further discussed below.

Our finding of lower zBMI during COVID-19 compared to the pre-pandemic situation among Indonesian adolescents is in notable contrast with findings of

Table 2. Results of structural equation models for main effects of baseline zBMI, emotional overeating, food responsiveness, sex, area predicting zBMI change during COVID-19

Model and variables	B	SE	β	*p value*
Model 1 (main effects model)				
zBMI_W1	−0.14	0.02	−0.44	<0.001
EOE_W1	0.00	0.00	0.04	0.46
FR_W1	0.00	0.01	0.04	0.39
Sex	0.11	0.04	0.14	0.01
Area	0.03	0.04	0.04	0.42
Model 2 (main model, two-way interactions, three-way interactions)				
BMI_W1	−0.12	0.04	−0.37	<0.001
EOE	0.00	0.01	0.04	0.79
FR	−0.01	0.01	−0.08	0.39
Sex	0.02	0.06	0.02	0.81
Area	−0.01	0.05	−0.02	0.79
Sex × area	0.13	0.08	0.15	0.11
Sex × EOE	−0.02	0.02	−0.18	0.31
Sex × FR	0.00	0.02	0.00	0.99
Area × EOE	0.01	0.01	0.07	0.60
Area × FR	0.02	0.01	0.11	0.28
Sex × area × EOE	0.01	0.02	0.08	0.64
Sex × area × FR	−0.01	0.02	−0.07	0.54
Sex × area × zBMI_W1	0.03	0.09	0.06	0.72

W1, baseline (before COVID-19); EOE, emotional overeating; FR, food responsiveness.

previous studies (mainly Western), most often reporting increases in zBMI during COVID-19 [7, 9, 14, 37]. We hypothesized an increase in zMBI during COVID-19 because of these previous studies and because the prevalence of overweight among Indonesian adolescents has been increasing pre-pandemic [18, 19]. Notably, the pandemic situation (i.e., stressful situation), cultural and national differences may be responsible for the differences found in this specific higher SEP group. Previous studies in Western countries showing weight gain during COVID-19 [7, 9, 14, 37] explained this finding by the fact that people ate more palatable food at home, performed fewer physical activities, and were more sedentary (i.e., screen times, playing video games). These underlying weight-related behaviors may be different among Indonesian adolescents from higher SEP backgrounds for the following reasons. First, due to lockdown, the adolescents obviously ate all meals at home, and this could prevent the consumption of junk food usually consumed outside home, at school, and surroundings [38]. Second, in contrast to other studies in Western countries, Indonesian adolescents might have been more physically active during the lockdown than before. A previous study [17] showed that Indonesian students were physically active during the lockdown, whereas studies in European and American countries mostly showed lower average physical activity during the lockdown compared to before [9, 11]. Although speculative, adolescents in Indonesia from higher socio-economic status usually go to school by car or motorbike, in contrast to students in Europe who usually go to school by walking or by bike (and not anymore during the COVID-19 period). Indonesian adolescents in the present study might also have had more facilities to do physical activities (such as bicycle, treadmill) at home compared to average European and American adolescents, given their higher SEP background. Some preliminary analyses on physical activity questions among our sample support this idea that Indonesian adolescents in our study were more active during compared to before COVID-19. Future studies should further examine the weight-related behaviors and mechanisms underlying our weight findings.

Moreover, that adolescents with higher baseline zBMI appear to show relatively more decreasing zBMI patterns during COVID-19 compared to those with lower baseline zBMI is an important finding. It suggests that more 'weight-vulnerable' adolescents actually seem to benefit more from the contextual changes. These include less exposure to the particularly unhealthy food environments at Indonesian schools and more exposure to the potentially healthier home environments. This finding again differs from previous findings in European and American countries as in these countries, adolescents with higher zBMI values were often the ones most vulnerable to gain weight during COVID-19 [7, 14, 37]. The same explanations regarding differences between Indonesian and European countries mentioned before may also explain this divergent finding. Specifically, adolescents with a higher initial zBMI are expected to be more "food-cue" reactive [39], and healthy environmental changes may, as such, make most impact among them compared to adolescents with lower initial zBMI values.

Our study did not find any other main or moderating effects involving adolescent sex and urban area that have been previously found [1, 31, 32]. However, male adolescents showed relatively less decreasing zBMI patterns compared to females, which is in line with previous findings among adolescents, including our own [31]. Of note, urban area was measured through the school context specifically. We assumed that both the school and living area were closely related, but this does not need to

be the case. During COVID-19, adolescents could not go to school and had to be at home most of the time. Although the fast-food restaurants were opened during the lockdown and offered delivery service, adolescents might not have had their regular "school pocket money" or were not allowed to buy or order food from outside the house themselves and might have experienced more control from parents about the food they ate at home. This might explain why we did not find any interactions between sex and urban area in this specific study during COVID-19, while we found such interactions in the pre-pandemic period [31]. Finally, appetitive traits did also not explain any variance in changes in zBMI during COVID-19, also not in combination with other variables such as sex. However, it should be noted that appetitive traits did not show the expected cross-sectional positive associations with zBMI that one would expect based on previous literature [21, 25, 39–41]. Although the internal consistency of this scale was sufficient, this questionnaire has some limitations, which are described in the limitation section.

Strengths and Limitations

The strengths of this current study are the longitudinal measures spanning before and during COVID-19 period among a relatively large sample of Indonesian adolescents. Despite these strengths, this study also had some limitations that need to be considered. First, due to the lockdown, not all weight and height measurements were objectively measured. Self-reported weight and height measures may be biased [42]. However, in our study, most weight and height measures were objectively measured and for those that were not, we did not find any differences with the objectively reported ones. As such, we do not expect that this invalidates our conclusions. Second, although the items to measure emotional overeating and food responsiveness were based on a validated questionnaire (i.e., the AEBQ [34]) and the internal consistencies of the different appetitive factors proved to be adequate, we have translated this questionnaire and some correlations were unexpected, as mentioned. As such, future research should further test the psychometric characteristics of this questionnaire in Indonesia. Third, zBMI cannot well differentiate between body fat and lean (i.e., fat free) mass [43]. Nevertheless, it gives an indication about weight changes over time. Finally, although attrition was mostly at random, some more females and adolescents from urban areas were included at follow-up. However, given that we used imputation, our analyses should not be biased by the missingness of these variables.

Conclusions

Taking the limitations into account, findings of our study suggest that Indonesian adolescents were generally not more vulnerable for zBMI increases during COVID-19 and even appeared to decrease in terms of zBMI during COVID-19. Females and adolescents with higher pre-COVID-19 zBMI were more impacted from the COVID-19 pandemic situation in terms of these decreasing zBMI patterns. Overall, our findings suggest that (culturally-specific) contextual changes (i.e., less exposure to the Indonesian food environment at schools and more exposure to the home environment) might have a beneficial impact in terms of preventing overweight among Indonesian adolescents, particularly among those being more vulnerable (i.e., having higher baseline zBMI). We have discussed eminent differences between Asian versus Western countries that may explain these specific effects. Future research should further examine these country-specific differences, as this provides insights that are important for the development of future preventive interventions, including among Indonesian adolescents from private schools.

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Statement of Ethics

All procedures performed were in accordance with the ethical standards of Ethics Committee Social Science of Radboud University, Nijmegen, The Netherlands (reference ECSS_2019_150). Written informed consent was obtained from parents and students. Three schools obtained active consent forms from parents and students. Based on the school policy, the remaining two schools informed the parents about this project (passive consent) and collected the signed consent forms from students only. This consent procedure was reviewed and approved by the Ethics Committee Social Science of Radboud University, Nijmegen, The Netherlands (ECSS-2019-115).

Conflict of Interest Statement

All authors declare that they have no competing interests.

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Author Contributions

J.M.V., J.K.L., and W.J.B. were responsible for the study design. J.M.V. and J.K.L. supervised the data collection. E.S. was responsible for the data collection and wrote the first version of the manuscript. W.J.B. supervised the statistical analyses. J.M.V., J.K.L., and W.J.B. edited the first version of the manuscript. All authors participated in the revisions of the manuscript and read and approved the final manuscript.

Data Availability Statement

The data set used in this study is not publicly available due to agreements we have made concerning the exchange and use of our data. The data set is accessible upon reasonable request to the corresponding author via eveline.sarintohe@ru.nl.

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