



## Screen time, social media use, and weight-change behaviors: Results from an international sample of adolescents

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### ABSTRACT

This study aimed to investigate whether screen time and social media use are associated with weight-change behaviors among an international sample of adolescents. Cross-sectional data from the 2020 International Food Policy Study Youth Survey (ages 10–17; Australia, Canada, Chile, Mexico, United Kingdom, United States;  $N = 12,031$ ) were analyzed. Self-reported hours of use of five forms of screen time (e.g., social media use), and total screen time per weekday were assessed. Use of six contemporary social media platforms (e.g., Facebook, Instagram) were also assessed. Weight-change behaviors included current attempts to gain weight, lose weight, stay the same weight, and not do anything to change weight, as well as dieting to lose weight in the past 12 months. Greater total screen time per weekday was associated with attempts to gain weight and lose weight, and dieting to lose weight. Specific social media platform use was associated with weight-change behaviors. For example, use of Twitter was most strongly associated with attempts to gain weight, lose weight, and dieting to lose weight. Findings underscore the international pervasiveness of screen time and social media use correlating with weight-change behaviors among adolescents. Global efforts are needed to ensure the appropriate use of screens and social media among adolescents.

### 1. Introduction

Screen time and social media use are ubiquitous among adolescents (Nagata et al., 2021a), with a significant increase in use during the COVID-19 pandemic (Nagata et al., 2021b). For many adolescents, screen time and social media use are mechanisms of entertainment and social connection, which ultimately creates avenues for psychological, emotional, and social impacts (Chassiakos et al., 2016; Lissak, 2018). For example, research has shown that higher levels of screen time and social media use (i.e., hours) (Przybylski et al., 2020; Orben and Przybylski, 2019), correlate with depression, anxiety, physical inactivity, higher body mass index (BMI), poor body image, and eating disorders (Lissak, 2018; Nagata et al., 2021c; Nagata et al., 2021d; Harriger et al., 2022; Derenne and Beresin, 2018). The latter of which, poor body image

and eating disorders, have recently gained significant media attention (Woo, 2021; Wells et al., 2021).

Indeed, recent research has underscored the relationship between screen time and social media use and poor body image, often via mechanisms of comparing appearances, among younger individuals, such as adolescents (Saiphoo and Vahedi, 2019; Fardouly and Vartanian, 2016). Additionally, social media algorithms may play an important role in body dissatisfaction, whereby users see more of the content that they engage with, either actively via following specific accounts or “liking” content, or passively via spending longer time on photos/videos. This creates a “rabbit hole” for users, which ultimately perpetuates unrealistic body ideals and further propels attempts to change one’s body (Harriger et al., 2022). This may be particularly problematic for adolescents given the appearance-based changes that accompany puberty

*Abbreviations:* BMI, Body mass index; IFPS, International Food Policy Study; M, Mean; SD, Standard deviation.

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(Rapee et al., 2019), which may increase body dissatisfaction and attempts to change one's body. Furthermore, adolescent health and wellbeing are particularly influenced by social domains (Patton et al., 2016).

While much of the focus on the impacts of screen time and social media use have focused on efforts to lose weight, such as dieting (Derenne and Beresin, 2018; Fardouly and Vartanian, 2016; Padín et al., 2021), less is known about how these factors are associated with weight gain attempts, which is more common and understudied among boys (Solmi et al., 2020). The relationships between screen time and social media use and efforts to alter one's body, either weight loss or weight gain attempts, are likely driven by similar mechanisms. Specifically, viewing culturally ideal body types, one that is thin, toned, and curvy for girls (Kelley et al., 2010) and muscular and lean for boys (Murray et al., 2017), can lead to the internalization of such ideals and increase body dissatisfaction, thus catalyzing behavioral attempts to achieve such ideals (Tyka, 2021; Ata et al., 2015). This process may be particularly important given that both screen time, social media use (Nagata et al., 2021b), and eating disorders (Taquet et al., 2021; Linardon et al., 2022) have increased among adolescents during the COVID-19 pandemic. Additionally, much of the literature on the relationship between screen time and social media use and weight-change behaviors is focused on regional samples (Padín et al., 2021) from high-income, western, English-speaking countries, which neglects the global pervasiveness of screen time and social media use (World Health Organization, 2020). Furthermore, while body ideals have evolved over time, and there is some homogeneity in body ideals cross-culturally, many of the dominant ideals (i.e., thin and toned for girls and muscular and lean for boys) are more prevalent in high-income, English-speaking contexts (Nagata et al., 2020a; Swami, 2015; Reel et al., 2015).

To address the gaps in the literature, this study aimed to determine the association between hours of weekday screen time and social media use and weight-change behaviors, including weight loss and weight gain attempts, and dieting to lose weight, among an international sample of adolescents from Australia, Canada, Chile, Mexico, the United Kingdom, and the United States. These countries were selected given they represent four diverse, high-income, predominately English-speaking countries (Australia, Canada, United Kingdom, United States), as well as two middle-income, non-English-speaking countries (Chile, Mexico), which may elucidate international trends. Findings will provide important knowledge regarding the global connection between screen time and social media use on weight-change behaviors, with a specific advancement of knowledge by including participants in middle-income, non-English speaking countries (i.e., Mexico and Chile).

## 2. Methods

Data from the 2020 International Food Policy Study (IFPS) Youth Survey were analyzed in 2022. IFPS Youth Survey is an annual repeat cross-sectional survey conducted in Australia, Canada, Chile, Mexico, the United Kingdom, and the United States (pooled sample). These six countries were chosen for the IFPS given similarities in their food environments, languages, and cultures, and differences based on national-level nutrition policies (Hammond et al., 2022). Data were collected via self-completed web-based surveys conducted in November and December 2020 with adolescents aged 10 to 17 years. Respondents were recruited through parents/guardians enrolled in the Nielsen Consumer Insights Global Panel and their partners' panels. Email invitations with unique survey links were sent to adult panelists within each country. Those who confirmed they had an adolescent aged 10 to 17 living in their household were asked for permission for their adolescent to complete the survey (only one adolescent per household was invited). Adolescents aged 10 to 17 years were eligible to participate, with quotas for age and sex groups in the United Kingdom and United States. After eligibility screening, all potential respondents were provided with information about the study and asked to provide assent. The adolescent's

parent/guardian received remuneration in accordance with their panel's usual incentive structure (e.g., points-based or monetary rewards, chances to win prizes). Surveys were conducted in English in Australia and the United Kingdom; Spanish in Chile and Mexico; English or French in Canada; and English or Spanish in the United States. Non-English surveys were translated back to English. Translation was completed by professional translation services and reviewed by original research team members who were native in each language. The median survey time was 25 min. The study was reviewed by and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE# 41477). A full description of the study methods can be found elsewhere (Hammond et al., 2021).

### 2.1. Participants

A total of 12,489 adolescent completed the survey. Respondents were excluded for the following reasons: region was missing, ineligible or had an inadequate sample size (i.e., Canadian territories); invalid response to a data quality question; survey completion time under 10 min; and/or multiple invalid responses to open-ended measures ( $n = 458$ ). The final analytic sample included 12,031 respondents (Australia:  $n = 1595$ ; Canada:  $n = 3895$ ; Chile:  $n = 1615$ ; Mexico:  $n = 1823$ ; United Kingdom:  $n = 1521$ ; United States:  $n = 1582$ ).

### 2.2. Measures

#### 2.2.1. Screen time and social media use

Screen time was measured based on number of hours spent on a normal weekday using five contemporary recreational screen modalities ("On a normal weekday, how much time do you spend..."), including "watching YouTube," "On social media (including messaging, posting, or liking posts)," "Watching TV shows, series, or movies," "Playing games on smartphones, computers, or game consoles," and "Browsing, reading websites, Googling, etc.". Total weekday screen time use was also calculated using the sum of the five screen modalities.

Social media platform use was measured based on the presence or absence of current use of six contemporary forms of social media, including "Facebook," "Instagram," "TikTok," "Twitter," "Snapchat," and "Twitch." These screen time and social media variables largely align with prior research and are among the most commonly used among adolescents (Nagata et al., 2021a; Nagata et al., 2021b; Nagata et al., 2021d; Potvin et al., 2022).

#### 2.2.2. Weight-change behaviors

Weight-change behaviors were measured using two items. Current weight-change behavior was measured using the question, "Which of the following are you trying to do about your weight?" Potential response options included, "Nothing," "Stay the same weight," "Gain weight," "Lose weight," and "Don't know," aligning with prior research (Solmi et al., 2020). Dieting to lose weight in the past 12 months was measured based on yes or no responses to the question, "Have you been on a diet to lose weight in the past 12 months?"

#### 2.2.3. Sociodemographic variables

Sociodemographic variables included sex (girls, boys), age (continuous), BMI z-score (World Health Organization classification) (De Onis et al., 2007), and country (Canada, Australia, United Kingdom, United States, Mexico, Chile). Adolescent race/ethnicity was categorized into binary majority and minority groups based on census questions asked in each country. Parents or guardians of adolescent participants provided information of family income adequacy (i.e., how difficult or easy it is for the family to make ends meet). These variables were controlled for in adjusted analyses given prior research showing associations with screen time, social media use, and weight-change behaviors (Nagata et al., 2021a; Nagata et al., 2021c; Fardouly and Vartanian, 2016; Nagata et al., 2020b; Nagata et al., 2019; Ganson et al., 2021).

### 2.2.4. Statistical analyses

Sample characteristics were calculated using frequencies (percent) for categorical variables and means (M) and standard deviation (SD) for continuous variables. Multiple multinomial logistic regression models were estimated to determine the association between screen time and social media platform use and current weight-change behavior. Coefficients for all multinomial logistic regression models were transformed to relative risk ratios. Multiple modified Poisson regression models were estimated to determine the association between screen time and social media platform use and dieting to lose weight in the past 12 months. Coefficients for all Poisson regression models were transformed to prevalence ratios (Zou, 2004). Data were weighted with post-stratification sample weights constructed using a raking algorithm with population estimates from the census in each country based on age group, sex, region, and ethnicity (except in Canada). Statistical significance was determined using the Benjamini-Hochberg procedure with a 10% false-discovery rate (Benjamini and Hochberg, 1995). Statistical analyses were conducted using Stata version 17 (StataCorp LLC, 2022).

## 3. Results

Among the sample of 12,031 adolescent participants, 51% were boys, the mean age was 13.5 years (SD 2.2 years), and 73.4% were part of a majority race/ethnicity within their country (Table 1). A majority (43.2%) of participants were within the “normal weight” of BMI z-score, were in families with neither easy nor difficult financial situations (38.2%), and were in Canada (32.4%). Over two thirds of the sample reported doing nothing (36.5%) or trying to stay the same weight (35.2%). Nearly 11% of the sample reported dieting to lose weight in the past 12 months.

Average total screen time per weekday was 7.5 h (SD = 5.0) among the sample. The average time watching YouTube (M = 1.7, SD = 1.4), TV (M = 1.7, SD = 1.3), and playing video games (M = 1.7, SD = 1.5) were highest among the sample, followed by social media hours (M = 1.4, SD = 1.4) and browsing the web (M = 1.1, SD = 1.2). Instagram was the most commonly used social media platform among the sample (55%) while Twitch (12.4%) was the least commonly used social media platform.

Findings investigating the association between screen time and social media platform use and weight-change behaviors are displayed in Table 2 and Table 3. In unadjusted analyses (results not shown), findings were the same as adjusted analyses. Therefore, for parsimony, results from adjusted analyses are summarized as follows. Regarding screen time, among the sample, greater screen time across four of the five modalities (YouTube, social media, video games, browsing the web) and total screen time, with the exception of hours watching TV, were associated with greater relative risk of efforts to either gain weight or lose weight relative to doing nothing to change weight. This pattern remained the same for social media platform use. Specifically, reporting use of each of the six social media platforms was associated with greater relative risk of efforts to either gain weight or lose weight relative to doing nothing to change weight. Regarding dieting to lose weight, greater screen time across all five modalities, as well as greater total screen time, was associated with higher prevalence of reporting engaging in a diet to lose weight in the past 12 months. Similarly, reporting use of each of the six social media platforms was associated with greater prevalence of reporting engaging in a diet to lose weight in the past 12 months. In sensitivity analyses excluding those with BMI missing, results remained the same for all analyses.

Additional exploratory supplemental analyses stratified by sex and BMI were also conducted (see Supplement). Findings were largely the same with slight differences in effect sizes between sexes, and various patterns emerged across BMI categories.

**Table 1**

Characteristics of adolescent participants (N = 12,031) from the 2020 International Food Policy Study.

	% / M (SD)
Sex	
Girls	49.0
Boys	51.0
Age	13.5 (2.2)
Race/Ethnicity <sup>a</sup>	
Majority	73.4
Minority	26.6
BMI Z-Score Classification	
Z-Score < -3 (“Severe Thinness”)	1.8
-3 ≤ Z-Score < -2 (“Thinness”)	1.8
-2 ≤ Z-Score ≤ 1 (“Normal Weight”)	43.2
1 < Z-Score ≤ 2 (“Overweight”)	17.1
Z-Score > 2 (“Obesity”)	11.4
Missing	24.7
Family Income Adequacy	
Very Easy	7.8
Easy	20.0
Neither Easy nor Difficult	38.2
Difficult	26.0
Very Difficult	7.3
Don’t Know	0.6
Country	
Canada	32.4
Australia	13.3
United Kingdom	12.6
United States	13.1
Mexico	15.1
Chile	13.4
Weight-Change Behavior, Current	
Nothing	36.5
Stay the Same Weight	35.2
Gain Weight	9.2
Lose Weight	18.2
Don’t Know	0.9
Diet to Lose Weight, Past 12 Months	
No	89.1
Yes	10.9
Screen Time, Hours per Weekday	
YouTube Hours	1.7 (1.4)
Social Media Hours	1.4 (1.4)
TV Hours	1.7 (1.3)
Video Game Hours	1.7 (1.5)
Browsing Web Hours	1.1 (1.2)
Total Screen Time Hours	7.5 (5.0)
Social Media Platform Use (“Yes” Responses)	
Facebook	49.6
Instagram	55.0
TikTok	48.5
Twitter	21.7
Snapchat	38.3
Twitch	12.4

Note: Preconstructed sample weighting applied to all analyses.

M = Mean; SD = Standard deviation.

<sup>a</sup> Canada: majority if ‘White (European descent)’ is only category checked or ‘other’ response such as Caucasian, Canadian, Jewish; minority if any other category checked; Australia: majority if only speak English at home; minority if speak a language other than English at home, or indicated they are aboriginal or Torres Straight Islander; United Kingdom: majority if only checked a ‘white’ option; minority if checked any other category; United States: majority if ‘white’ is only category checked; minority if any other category checked; Mexico: majority if do not consider self indigenous; minority if consider self indigenous; Chile: majority if do not consider self indigenous; minority if consider self indigenous.

## 4. Discussion

The findings from this study emphasize that greater number of hours of screen time per weekday, as well as use of five specific contemporary social media platforms, are correlated with varying patterns of weight-change behaviors, including weight loss and weight gain attempts and dieting to lose weight, among a large and international sample of

**Table 2**

Associations between screen time and social media platform use and current weight-change behavior among adolescent participants (N = 12,031) from the 2020 International Food Policy Study.

	Nothing vs. Stay the same weight		Nothing vs. Gain weight		Nothing vs. Lose weight		Nothing vs. Don't know	
	RRR (95% CI) <sup>a</sup>	p	RRR (95% CI) <sup>a</sup>	p	RRR (95% CI) <sup>a</sup>	p	RRR (95% CI) <sup>a</sup>	p
Screen Time, Hours per Weekday								
YouTube Hours	0.97 (0.94–1.01)	0.110	<b>1.09 (1.04–1.15)</b>	<b>0.001</b>	<b>1.08 (1.03–1.13)</b>	< <b>0.001</b>	0.90 (0.76–1.08)	0.253
Social Media Hours	<b>1.05 (1.01–1.09)</b>	<b>0.007</b>	<b>1.16 (1.10–1.22)</b>	< <b>0.001</b>	<b>1.14 (1.09–1.19)</b>	< <b>0.001</b>	1.14 (0.98–1.33)	0.088
TV Hours	1.03 (0.99–1.07)	0.086	1.01 (0.95–1.07)	0.843	1.03 (0.99–1.08)	0.139	1.06 (0.90–1.23)	0.478
Video Game Hours	<b>0.94 (0.90–0.97)</b>	< <b>0.001</b>	<b>1.06 (1.00–1.11)</b>	<b>0.040</b>	<b>1.07 (1.03–1.12)</b>	<b>0.001</b>	1.00 (0.83–1.19)	0.962
Browsing Web Hours	<b>1.10 (1.05–1.15)</b>	< <b>0.001</b>	<b>1.19 (1.12–1.27)</b>	< <b>0.001</b>	<b>1.15 (1.08–1.21)</b>	< <b>0.001</b>	1.17 (0.96–1.43)	0.111
Total Screen Time Hours	1.00 (0.99–1.01)	0.512	<b>1.03 (1.02–1.05)</b>	< <b>0.001</b>	<b>1.03 (1.02–1.05)</b>	< <b>0.001</b>	1.01 (0.97–1.06)	0.543
	Nothing vs. Stay the Same Weight		Nothing vs. Gain Weight		Nothing vs. Lose Weight		Nothing vs. Don't Know	
Social Media Platform Use	RRR (95% CI) <sup>a</sup>	p	RRR (95% CI) <sup>a</sup>	p	RRR (95% CI) <sup>a</sup>	p	RRR (95% CI) <sup>a</sup>	p
Facebook	<b>1.59 (1.44–1.77)</b>	< <b>0.001</b>	<b>1.61 (1.37–1.89)</b>	< <b>0.001</b>	<b>1.31 (1.15–1.48)</b>	< <b>0.001</b>	0.86 (0.52–1.41)	0.546
Instagram	<b>1.32 (1.19–1.47)</b>	< <b>0.001</b>	<b>1.66 (1.41–1.95)</b>	< <b>0.001</b>	<b>1.52 (1.33–1.73)</b>	< <b>0.001</b>	1.18 (0.75–1.85)	0.468
TikTok	1.07 (0.97–1.18)	0.188	<b>1.29 (1.10–1.51)</b>	<b>0.001</b>	<b>1.34 (1.19–1.52)</b>	< <b>0.001</b>	1.26 (0.82–1.95)	0.292
Twitter	<b>1.83 (1.61–2.08)</b>	< <b>0.001</b>	<b>2.05 (1.71–2.45)</b>	< <b>0.001</b>	<b>1.74 (1.49–2.03)</b>	< <b>0.001</b>	1.29 (0.64–2.59)	0.481
Snapchat	1.10 (0.99–1.22)	0.073	<b>1.49 (1.27–1.75)</b>	< <b>0.001</b>	<b>1.18 (1.03–1.34)</b>	<b>0.013</b>	1.35 (0.84–2.15)	0.211
Twitch	<b>1.33 (1.14–1.55)</b>	< <b>0.001</b>	<b>1.78 (1.44–2.20)</b>	< <b>0.001</b>	<b>1.59 (1.33–1.91)</b>	< <b>0.001</b>	0.85 (0.35–2.04)	0.713

Note: Preconstructed sample weighting applied to all analyses. **Boldface** indicates statistical significance based on Benjamini-Hochberg procedure.

RRR = Relative risk ratio; CI = Confidence interval.

<sup>a</sup> Adjusted for age, race/ethnicity, body mass index z-score classification, family income adequacy, and country.

**Table 3**

Associations between screen time and social media platform use and dieting to lose weight in the past 12 months among adolescent participants (N = 12,031) from the 2020 International Food Policy Study.

Screen time, hours per weekday	PR (95% CI) <sup>a</sup>	p
YouTube Hours	<b>1.08 (1.04–1.12)</b>	< <b>0.001</b>
Social Media Hours	<b>1.14 (1.10–1.18)</b>	< <b>0.001</b>
TV Hours	<b>1.05 (1.01–1.09)</b>	<b>0.014</b>
Video Game Hours	<b>1.06 (1.02–1.10)</b>	<b>0.002</b>
Browsing Web Hours	<b>1.10 (1.06–1.15)</b>	< <b>0.001</b>
Total Screen Time Hours	<b>1.03 (1.02–1.04)</b>	< <b>0.001</b>
Social Media Platform Use	PR (95% CI) <sup>a</sup>	p
Facebook	<b>1.38 (1.22–1.56)</b>	< <b>0.001</b>
Instagram	<b>1.53 (1.33–1.75)</b>	< <b>0.001</b>
TikTok	<b>1.39 (1.24–1.56)</b>	< <b>0.001</b>
Twitter	<b>1.81 (1.61–2.03)</b>	< <b>0.001</b>
Snapchat	<b>1.37 (1.22–1.55)</b>	< <b>0.001</b>
Twitch	<b>1.64 (1.44–1.87)</b>	< <b>0.001</b>

Note: Preconstructed sample weighting applied to all analyses. **Boldface** indicates statistical significance based on Benjamini-Hochberg procedure.

PR = Prevalence ratio; CI = Confidence interval.

<sup>a</sup> Adjusted for age, race/ethnicity, body mass index z-score classification, family income adequacy, and country.

adolescents. The findings extend prior research by, first, including samples from six distinct and diverse countries and, second, investigating a variety of contemporary screen time (i.e., YouTube, etc.) and social media (i.e., TikTok, Twitch, etc.) platforms. Indeed, much like prior research (Przybylski et al., 2020; Orben and Przybylski, 2019), findings showed there is a dose response in relation to screen time use and weight-change behaviors, whereby the higher the number of hours of screen time, the stronger the association with attempts to change one's weight. Overall, these findings align with prior research underscoring the potentially problematic association between excess screen

time and social media use and body dissatisfaction and eating disorder behaviors (Derenne and Beresin, 2018; Saiphoo and Vahedi, 2019; Fardouly and Vartanian, 2016; Padín et al., 2021), particularly among adolescents. Importantly, the findings extend prior research by showing that the association between screen time and social media use and weight-change behaviors are independent of one's country. This notion underscores the potentially harmful nature of excessive screen time and social media use among adolescents globally.

Specifically, greater number of hours of screen time, except for watching TV, was associated with greater relative risk of weight gain attempts and weight loss attempts, relative to those not attempting to change their weight. In fact, the effect sizes for weight gain and weight loss attempts were comparable across screen time modalities, indicating that screen time may not just increase one's desire and attempts to lose weight, but may also influence one to attempt to gain weight. This pattern remained largely the same for social media platform use and weight gain and weight loss attempts. In fact, engagement on Facebook, Instagram, Twitter, Snapchat, and Twitch all had greater effect sizes for weight gain attempts than weight loss attempts. These findings counter the common narrative that screen time and social media use may solely impact one's desire to lose weight (Derenne and Beresin, 2018; Fardouly and Vartanian, 2016; Padín et al., 2021) and instead emphasize that weight gain attempts may result from screen time and social media engagement. These findings are supported by changes to the ideal body for adolescents to one that is more muscular and lean for boys (Murray et al., 2017) and toned, fit, and curvy for girls (Kelley et al., 2010). However, it should be noted that body ideals promoted via social media platforms may vary depending on one's country, underscoring the need for future research investigating the correlates of screen time and social media use and weight-change behaviors, particularly within diverse, non-Western countries.

It should also be highlighted that there were significant associations found between screen time and social media use and efforts to stay the

same weight relative to those not attempting to change their weight. Specifically, associations were found with greater time on social media and browsing the web, as well as use of Facebook, Instagram, Twitter, and Twitch. These are unique findings in that during adolescence it is expected that growth and subsequent weight gain occurs (Sawyer et al., 2012) and weight gain is common as one ages from adolescences to young adulthood (Chu et al., 2021). Therefore, these findings indicate that screen time and social media use also influence one's attempts to stay the same weight, which counters natural developmental and growth processes. Furthermore, efforts to stay the same weight may also be problematic, such as via dieting, fasting, use of diet pills, and excessive exercise (Chu et al., 2021; Lowry et al., 2002; Chin et al., 2018).

Regarding dieting to lose weight, findings showed that, overall, greater screen time was associated with greater prevalence of dieting to lose weight among the sample, with a 14% increase in prevalence for each additional hour of social media hours. Indeed, use of all six social media platforms was also associated with greater prevalence of dieting to lose weight with an 81% increase in prevalence for Twitter engagement. The delineated findings across social media platforms provide unique information on the forms of social media platforms that may have the greatest impact on weight-change behaviors, as well as may counter commonly held beliefs. For example, the use of image-based social media platforms, such as Instagram and Snapchat, have garnered significant research attention as it relates to body dissatisfaction and weight-change behaviors given their perpetuation of body ideals (Harriger et al., 2022; Padín et al., 2021; Marks et al., 2020). Conversely, Twitter, a predominately text-based platform, and Twitch, a live video streaming platform, had stronger associations with weight-change behaviors than Instagram and Snapchat. These findings may be evidence that use of specific social media platforms may be more than just catalysts of weight gain and weight loss attempts and dieting via impacts to body dissatisfaction and body comparisons. Instead, the use of certain social media platforms may be avenues of information gathering on exercise and diet regimens, as well as appearance- and performance-enhancing drugs and substances (i.e., whey protein, laxatives), potentially via influencers or advertisements, for adolescents to use to achieve specific body image ideals (Ganson and Rodgers, 2022). Furthermore, text-based platforms, such as Twitter, may be better able to target their advertisements, particularly those related to food, dieting, weight-change behaviors, and exercise, versus image-based platforms. Overall, the findings from this study should be contextualized by the algorithms that are at the foundation of social media platforms. These algorithms adjust and change as users engage with specific content. Therefore, each user has their own, personalized experience, where feedback loops and "rabbit holes" emerge, both of which may influence weight- and body-related attitudes and behaviors (Harriger et al., 2022), irrespective of one's country.

The findings from this study have important implications for future research and clinical and public health professionals. First, future research is needed, particularly on an international scale, to delineate the specific mechanisms that lead to weight-change behaviors across social media platforms. This may include a qualitative investigation with an international sample of adolescents. Second, clinical professionals should be alerted to the significant correlation between screen time and social media use and weight-change behaviors, and assess high users of screens and social media for potentially problematic weight-change behaviors. Finally, global public health professionals should be advocating for international and country-specific regulation and algorithmic changes to ensure that adolescents are not negatively impacted by screen time and social media use. This is particularly true given that all social media users have a unique experience based on their engagement on the platforms. Therefore, user-specific controls on their individual algorithm may be beneficial to reduce the effects and correlates of social media use. This may include options where users can turn on or off specific content, hashtags, keywords, imagery, and trending topics. Furthermore, stronger age verification is needed given that many in the

sample are below the age of use (i.e., < 13 years) for many of the social media platforms under study. Additionally, international and country-specific clinical and public health guidelines can be strengthened to provide practitioners, parents, and adolescents with detailed ways to monitor, control, and reduce screen time and social media use, as well as encourage positive body image and weight-related behaviors.

## 5. Limitations

Despite the important findings of the study and the cross-national nature of the data, several limitations should be noted. Respondents were recruited using a nonprobability-based sampling method; therefore, although the data were weighted by age group, sex, region, and ethnicity (except in Canada), the findings do not necessarily provide nationally representative estimates. While the large sample size is beneficial for analytic purposes, it may introduce a greater likelihood of finding statistically significant results (despite the use of the Benjamini-Hochberg procedure). Therefore, effect sizes should be considered alongside *p* values when interpreting the findings. In addition, there were notably higher levels of missing data for BMI, despite the findings remaining the same when excluding those with BMI missing. The items were based on self-report, which may increase the risk of social desirability and recall bias. Additionally, the screen time variable was a single-item measure that did not specify whether use was related to recreation or academic purposes, and was limited to weekday use only, which may be different than weekend use. The data are cross-sectional, which precludes causal determinations. Indeed, the relationships found in this study may be bidirectional (i.e., adolescents already engaging in weight-change behaviors may engage more on screens and social media). Lastly, the survey only inquired about sex and not gender, which may have implications related to internalized body ideals and thus weight-change attempts and dieting behaviors. Strengths include the large, diverse, and international sample, as well as the ability to investigate the use of contemporary screen time and social media platforms.

## 6. Conclusion

Among an international sample of adolescents, greater screen time and social media use are associated with weight-change behaviors, including attempts to gain weight, lose weight, and dieting. These findings align with prior research and underscore the international pervasiveness of the screen time and social media use correlating with weight-change behaviors among adolescents. Future research and clinical and public health prevention and interventions efforts are needed to protect the health and development of adolescents.

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## CRediT authorship contribution statement

**Kyle T. Ganson:** Conceptualization, Methodology, Formal analysis, Visualization, Writing – original draft, Writing – review & editing. **Jason M. Nagata:** Conceptualization, Writing – review & editing. **Catrin Penn-Jones:** Conceptualization, Writing – review & editing. **Alexander Testa:** Conceptualization, Writing – review & editing. **Dylan B. Janson:** Conceptualization, Writing – review & editing. **David Hammond:** Conceptualization, Data curation, Methodology, Project administration,

Funding acquisition, Supervision, Writing – review & editing.

## Declaration of Competing Interest

All authors declare no conflicts of interest.

## Data availability

The International Food Policy Study data is not publicly posted due to ethical considerations and to protect the confidentiality of participants. Data requests and requests for analysis codes can be sent to dhammond@uwaterloo.ca.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jpmed.2023.107450>.

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