

Indoor Tanning Use Among Adolescent Males: The Role of Perceived Weight and Bullying

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Skin cancers (i.e., melanoma, basal cell, and squamous cell carcinomas) are the most prevalent forms of cancer in the USA, with 3.5 million cases diagnosed annually [1]. In 2012, the number of new cases and deaths for melanoma were estimated at 76,250 and 9,180 [2]. Ultraviolet (UV) radiation exposure is considered the primary risk factor for developing skin cancer [3]. Meta-analytic data have revealed elevated relative risks of developing skin cancer for individuals who were exposed to indoor tanning before age 35 [4, 5]. Yet 73 % of females and 39 % of males under age 40 report lifetime use, with age of initiation typically in adolescence [6].

Appearance motives are strongly associated with actual use and intention to use indoor tanning [7–9]. In fact, appearance reasons to tan have been the strongest predictors of tanning intent in studies of adolescents [7]. Interestingly, body shape and weight concerns also have been associated with increased indoor tanning, further supporting that individuals with these concerns may tan in order to make their body shape appear more attractive [10, 11].

Much of the research on indoor tanning and body shape and weight has been conducted with females. However, males are less likely than females to engage in sun-protective habits [12] and are nearly 1.5 and 2 times more likely than females to be diagnosed with and die of melanoma [2], underscoring the importance of examining these factors among males. Studies of body mass index as a correlate of indoor tanning among adolescent males have shown inconsistent results [6, 11, 13]. Yet, a large-scale study of adolescent males [13] showed that the desire to gain weight and the desire to lose weight were both more common among tanners (33 and 21 %) than non-tanners (25 and 19 %). Furthermore, steroid use and unhealthy weight

loss strategies were 4 and 2.5 times more likely among indoor tanning high school males, compared to their non-tanning counterparts [14]. These findings suggest that boys who engage in indoor tanning disproportionately seek out appearance changing behaviors to gain or lose weight.

One possible factor which may influence associations of body weight/shape with tanning behavior is bullying victimization. Between 42 and 51 % of adolescents report bullying victimization [15] and being a victim of bullying is highly correlated with body dissatisfaction among adolescents [16–18]. Thus, males who report extreme weights (i.e., very underweight and very overweight) may be more likely to be victims of bullying, and subsequently endorse higher levels of body dissatisfaction. Heightened body dissatisfaction, in turn, increases risk for appearance-changing behaviors (i.e., eating pathology, excessive exercising, steroid use; [19]). It is therefore plausible that underweight and overweight males may use indoor tanning to enhance appearance, and that bullying victimization may increase this risk.

In the current study, we hypothesized that adolescent males who viewed their body weight as extreme (i.e., very underweight and very overweight) would be more likely to indoor tan compared to peers who viewed their weight as average. Furthermore, we hypothesized that bullying victimization would moderate this relationship, such that males who perceived themselves as an extreme weight and reported being victims of bullying would be more likely to engage in tanning compared to their counterparts who were not bullied.

Method

Participants and Procedure

Cross-sectional data on perceived weight status, bullying victimization, and indoor tanning use were culled from the 2009 Youth Risk Behavior Survey [20–22]. The Youth Risk

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Behavior Survey is a nationally representative school-based survey conducted by the U.S. Centers for Disease Control and Prevention (CDC) to monitor health-related behaviors among US high school students. The sampling design employed a three-stage cluster methodology that yielded a representative sample of grades 9 through 12 students enrolled at public, Catholic, and other private schools. Participation in the study was voluntary and anonymous. All study procedures for the 2009 survey were approved by the CDC's internal review board. A total of 16,410 students responded to the 2009 survey (88 % return rate), from 158 schools (81 % return rate). For the purposes of the current study, only participants who indicated their sex was male were included ($N=7,521$). Additional information regarding the survey's methodology is discussed in detail elsewhere [21].

Measures

Perceived Weight Status

Perceived weight status was assessed with the item, "How do you describe your weight?" Response options were "very underweight," "slightly underweight," "about the right weight," "slightly overweight," and "very overweight." These responses were bifurcated to create an "extreme weight" variable (0="slightly underweight," "about the right weight," and "slightly overweight"; 1="very underweight" and "very overweight").

Bullying Victimization

Bullying victimization was assessed with the item, "During the past 12 months, have you ever been bullied on school property?" Responses were coded 0="No", and 1="Yes." A preamble to this question stated: "Bullying is when 1 or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when 2 students of about the same strength or power argue or fight or tease each other in a friendly way."

Indoor Tanning Use

Frequency of indoor tanning was assessed with the item, "During the past 12 months, how many times did you use an indoor tanning device such as a sunlamp, sunbed, or tanning booth? (Do not include getting a spray-on tan.)" Response options were: 0="0 times," 1="1 or 2 times," 2="3 to 9 times," 3="10 to 19 times," 4="20 to 39 times," and 5="40 or more times." Given the dose–response relationship between frequency of indoor tanning and development of melanoma [3], responses were combined to isolate frequent tanners from minimal tanners and those who do not tan

(0="no tanning," 1="minimal tanning" [1–9 times], and 2="frequent tanning" [10+ times]) as is commonly done in the literature [10]. This approach increased statistical power to test interaction effects.

Demographic Characteristics

Participants reported race/ethnic identification, age, and school grade.

Statistical Analyses

Given that the outcome variable—indoor tanning frequency—represents non-interval level data, a multivariate ordinal regression analysis was conducted via GENLIN in SPSS (version 20). Ordinal regression has been shown to perform well in modeling skewed-dependent data, and also allows investigators to categorize data in clinically meaningful ways [23]. Main effects of perceived extreme weight and bullying victimization status (along with age and race/ethnicity) were entered into the model. To assess whether bullying victimization moderated an association between perceived weight status and indoor tanning use, the product term perceived weight by bullying victimization was also entered into the model. In the case of a significant regression coefficient for the interaction term, simple main effects analyses were planned to assess the conditional effect of the predictor variable (extreme weight status) at each level of the moderator variable (bullying victimization). To determine if self-perceived weight was related to bullying victimization, a Pearson chi-square test of independence was conducted.

Results

Preliminary Analyses

The sample ($N=7,521$, M age=16 [$SD=1.2$]) included 59 % non-Hispanic white, 14 % non-Hispanic black, 17 % Hispanic, and 10 % other race/ethnicity. School grade level was as follows: 28 % in grade 9, 26 % in grade 10, 23 % in grade 11, and 22 % in grade 12. Among participants, 6 % described themselves as very underweight or very overweight (3 % each), and 18 % reported bullying victimization at school within the previous 12 months. Non-tanners, minimal tanners, and frequent tanners represented 93 % ($n=7,022$), 4 % ($n=298$), and 3 % ($n=201$) of the sample. Bullying victimization was more prevalent among participants who perceived their weight as extreme (32.4 %) relative to participants who perceived their weight as average (17.7 %), $\chi^2_{(1)}=64.6$, $p<0.0001$.

Primary Analyses

Results from the multivariate ordinal regression analysis revealed significant effects for perceived weight and bullying victimization. These main effects were qualified by a perceived weight by bullying interaction (see Table 1). To characterize this interaction, simple main effects analyses were conducted, examining the perceived weight effect by bullied status. These analyses revealed that the effect of extreme weight on tanning behavior was stronger for males who were bullied (odds ratio=2.0; 95 % CI, 1.6, 2.5, $p<0.0001$) compared to males who were not bullied (odds ratio=1.5; 95 % CI, 1.3, 1.8; $p<0.0001$; see Fig. 1).

Discussion

Indoor tanning use is one of the strongest predictors of developing skin cancer [3], and identifying predictors of indoor tanning use is of particular importance for designing and implementing prevention and intervention strategies. Adolescent males are underrepresented in research on indoor tanning use, yet they engage in tanning to a degree that places them at risk for skin cancer [5]. Current results revealed that adolescent males who perceived themselves as being an extreme weight (very underweight or very overweight) engaged in more indoor tanning relative to males who perceived their own weight as average. This association was stronger among males who had been bullied in the past year.

The above findings speak to the salience of self-perceptions of appearance in motivation to tan. Adolescent males who perceive their weight as extreme may seek out tanning, in response to bullying, as one way to temper appearance dissatisfaction. For males, perceiving one's body as very underweight or very overweight, in

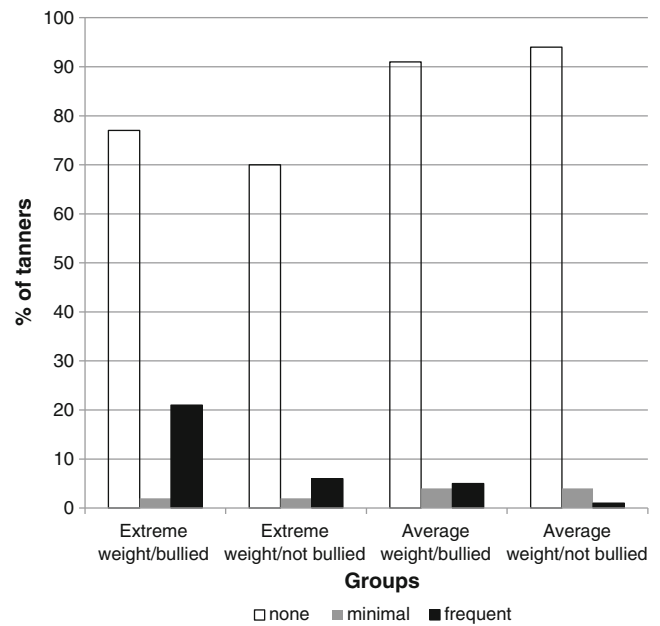


Fig. 1 Proportion of tanners within each weight/bullying group

and of itself, is associated with body dissatisfaction [19, 24]. Being the victim of bullying may further heighten body dissatisfaction [25], with tanning being one (or likely several) appearance-changing behaviors [26]. Thus, one possible approach to indoor tanning prevention among adolescents would be body image-focused programs. However, an alternative explanation, which should be tested in further research, is that adolescent boys who perceive their weight as extreme and are bullied seek out indoor tanning as a strategy to reduce general (not appearance specific) distress.

To date, appearance-based interventions for tanning behavior have focused primarily on female undergraduate students [27]. These approaches are varied in content, with some manipulating computerized photographs of

Table 1 Multivariate ordinal regression for indoor tanning frequency

Variable		<i>B</i>	<i>SE</i>	<i>OR</i>	<i>95%CI</i>	<i>Wald</i>	<i>p</i>
Bullied status	Not bullied						(Reference)
	Bullied	0.37	0.06	1.4	1.3, 1.6	43.5	0.0001
Extreme weight status	Average weight						(Reference)
	Extreme weight	0.40	0.10	1.5	1.2, 1.8	15.7	0.0001
Bullied × extreme weight		0.31	0.16	1.4	1.0, 1.8	3.9	0.04
Age		0.14	0.02	1.2	1.1, 1.2	52.6	0.0001
Race/ethnicity	Non-Hispanic White						(Reference)
	Non-Hispanic Black	0.02	0.07	1.0	0.89, 1.2	0.09	0.77
	Hispanic	0.21	0.09	1.2	1.0, 1.5	4.7	0.03
	Others	-0.003	0.07	0.99	0.87, 1.1	0.002	0.97

B unstandardized regression coefficient, *SE* standard error, *OR* odds ratio, *95% CI* 95 % confidence interval

participants to show current UV damage to skin and/or potential damage in advancing years [27], and others including risk reduction and psychoeducation on alternative, healthier appearance changing behaviors, e.g., exercise, clothing [28, 29]. Although these interventions appear to be more effective than interventions aimed primarily at increasing knowledge about the negative effects of tanning, long-term effects (e.g., beyond 6 months) are largely unknown [27]. While additional investigation is strongly needed, it may be plausible that an intervention that explicitly addresses body dissatisfaction in the context of peer group pressures could pose promise in regard to tanning behavior.

The current study had some limitations. The cross-sectional design precluded interpretation of temporal prediction. Additionally, the item assessing bullying victimization did not differentiate whether participants were bullied about appearance/weight or other factors, although appearance-based bullying is one of the most frequent forms noted among adolescents [30]. We also grouped participants who viewed their weight as very underweight or very overweight into an “extreme weight” category. Future research may benefit from powering studies to test differences between these two groups, as exploratory analyses indicated boys who perceived themselves as very underweight had a 9 % prevalence rate of frequent tanning, compared to 14 % among the very overweight group. Lastly, future research would likely benefit from exploring additional risk factors for indoor tanning among adolescent males, such as peer norms regarding tanning behaviors and internalization of the muscular ideal.

The current study was, to our knowledge, the first to focus on the role of bullying in the context of tanning. Participants were from a large, nationally representative sample, supporting the extent to which findings may generalize to US high school males. Results highlight the roles of perceived weight and bullying victimization as risk factors for adolescent male’s indoor tanning use. Adolescent males who perceive themselves as very underweight or very overweight may engage in more frequent indoor tanning compared to peers who view themselves as average weight, and this association may be stronger in males who experience bullying. Models for skin cancer prevention efforts among adolescent males may benefit by exploring body image and peer group appearance pressures in the context of motivation to engage in indoor tanning.

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