



Diet quality and bullying among a cross-national sample of youth☆☆☆



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ABSTRACT

Bullying perpetration and victimization have been linked to a number of high-risk health behaviors, including involvement in sedentary activities and sleep deprivation. Even so, the link between diet quality and bullying is generally overlooked. The present study examines the associations between diet quality, bully perpetration, and bully victimization in a cross-national sample of adolescents. Data come from the Health Behaviors of School Children (HBSC) survey, 2005/2006 (N = 142,828–143,425). Youths from 41 countries/regions in North America and Europe reported features of their social context, various health behaviors, and their involvement in bullying. Approximately 11% of youth in the sample bully other youths at least 2–3 times a month, whereas 13% of youth are bullied by other youths at least 2–3 times a month. Logistic regression analyses revealed that youths with low quality diets incurred a 123% increase in the odds of attaining bully status, relative to youths with high quality diets. No such association was detected between diet quality and victim status. Results also suggest that the association between low diet quality and bully perpetration is significantly more pronounced in very developed nations (relative to developed nations). Dietary behaviors may be an important point of intervention in the effort to minimize the prevalence of bullying among youths, particularly in very developed nations. Scholars should seek to build upon the current study by exploring the mechanisms (e.g., low self-control) that might explain the association between diet quality and bullying.

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1. Introduction

Recent prevalence estimates suggest that approximately 15% of youths are victims of cyberbullying and 36% of youths are victims of traditional bullying (Modecki et al., 2014). Research has indicated that being the victim of these forms of bullying can lead to various physical and psychological ailments, including chronic health problems, suicide ideation, and self-injury (Fahy et al., 2016; Kowalski and Limber, 2013; Kelly et al., 2015; Schneider et al., 2012). As a result, scholars and practitioners alike have identified bullying as an issue of considerable public health concern (Feder, 2007; Srabstein and Piazza, 2008) and the prevention of bullying among youth constitutes a key focus of study in the areas of adolescent health and interpersonal violence (Fahy et al., 2016; Kowalski and Limber, 2013). To date, multiple factors have been found to increase the risk of engaging in bullying behaviors, including school-generated strains (e.g., teacher-induced strain, low school safety) (Glew et al., 2005; Moon et al., 2011), low self-control

(Moon and Alarid, 2015), deficits in executive functioning (Coolidge et al., 2004), conflict with parents (Moon et al., 2012), lack of parental supervision/rules (Hemphill and Heerde, 2014), family violence and/or corporal punishment (Espelage et al., 2014; Fujikawa et al., 2015), peer victimization (Moon et al., 2012), and obesity (Janssen et al., 2004).

Although a number of individual, familial, and school factors have been linked to bullying perpetration and victimization, one risk factor for involvement in bullying that has generally been overlooked is diet quality. This oversight is somewhat surprising, as prior research has linked poor diet quality early in the life course to a number of problem behaviors, including childhood aggression, hyperactivity, impulsivity, inattention, and tantrums (Banta et al., 2013; Jackson, 2016). Furthermore, adolescents with lower quality diets have been found to be at greater risk of disrupting and/or being kicked out of class, fighting, acting aggressively, and engaging in delinquent behaviors (Oddy et al., 2009; Øverby and Høigaard, 2012; Trapp et al., 2016). Relatedly, recent research has also suggested that being raised in a food insecure household, which is associated with lower diet quality (Robaina and Martin, 2013), increases the risk of fighting and bullying among adolescents (Jackson and Vaughn, 2017). The link between diet quality and bullying might be explained through a number of mechanisms. For instance, children and adolescents with poor quality diets tend to exhibit lower levels of self-control and greater involvement in various externalizing behaviors (Banta et al., 2013; Jackson, 2016; Oddy et al., 2009; Øverby and Høigaard, 2012; Trapp et al., 2016), both of which have been linked

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to an increased risk of bully perpetration (Moon and Alarid, 2015; Cook et al., 2010). The potential for diet quality, self-control, and bullying to be interconnected is further buttressed by research supporting a glucose model of self-control (Gailliot and Baumeister, 2007; Gailliot et al., 2007). This model conceptualizes self-control as a limited energy resource that will deplete without a proper supply of blood glucose, and acknowledges dietary behaviors as having a direct impact on this supply (Gailliot and Baumeister, 2007; Gailliot et al., 2007). Relatedly, it is also possible that poor diet quality is linked to an increased risk of mood disturbances (i.e., increases in anger and hostility), which could in turn heighten the propensity to bully other students (Kien et al., 2013; Camodeca and Goossens, 2005).

In light of extant literature linking poor nutrition to problem behaviors (Banta et al., 2013; Jackson, 2016; Oddy et al., 2009; Øverby and Høigaard, 2012; Trapp et al., 2016), it is reasonable to suggest that youth with lower quality diets may be more apt to engage in bullying behaviors, especially since bullying and other problem behaviors tend to co-occur (Kim et al., 2006). It is also possible that victims of bullying may respond to their victimization by engaging in poorer eating behaviors, particularly as a way to cope with potential psychological distress, depression, and psychosomatic symptoms (Jochman et al., 2017; Sampasa-Kanyinga and Willmore, 2015). Despite these possibilities, empirical examinations of the association between diet quality, bully perpetration, and bully victimization are lacking (Holubcikova et al., 2015; Zahedi et al., 2014). Moreover, studies to date typically do not 1) include measures of diet quality that include healthy and unhealthy foods, 2) address potential variation in associations across perpetrators, victims, and victim-perpetrators (i.e., dual-status youths), or 3) employ a large, cross-national sample to enhance the generalizability of the results. The present study seeks to fill these voids in the literature by examining the association between diet quality, bully perpetration, and bully victimization among a large, cross-national sample of youth ages 11 to 16.

2. Methods

Data for the current study come from the Health Behaviors in School-Aged Children (HBSC) Survey, 2005/2006. The HBSC 2005/2006 survey is a World Health Organization (WHO) collaborative, cross-national survey conducted by the HBSC research network, which includes 41 countries/regions across Europe and North America. The purpose of this cross-sectional survey is to understand the health of youths in their social context, and the link between social behaviors and health behaviors among youths. Sampling was conducted using a clustered sampling design in accordance with the education systems within the countries being examined. In most cases, samples were nationally representative and were stratified to ensure representation by school type, geography, and racial/ethnic group. The majority of questionnaires were administered in schools between October 2005 and May 2006 by nurses, teachers, and other trained personnel to 11, 13, and 15 year-old youths (i.e., approximately grades 6, 8, and 10). In total, the international survey from 2005/2006 included >200,000 participants (although various countries did not collect data on all survey items, including bullying). Additional details concerning the HBSC 2005/2006 survey have been provided elsewhere (Gabhainn et al., 2008).

The measures of bullying in the present study were derived from two questions that were utilized in all of the countries that participated in the 2005/2006 survey (with the exception of Israel and Slovakia). First, youths were asked how many times they had been bullied at school during the past couple of months. Next, youths were asked how many times they had bullied another student (i.e., perpetrated bullying) at school in the past couple of months. Response options to both questions included never, once or twice, 2 or 3 times a month, about once a week, or several times a week. In line with prior research (Craig et al., 2009), youths who reported bullying other students 2–3

times a month or more were assigned a value of 1 on the “bully status” variable, whereas students who reported bullying other students less frequently (or never) were assigned a value of 0 on this variable. In a similar fashion, youths who reported being bullied by other students 2–3 times a month or more were assigned a value of 1 on the “victim status” variable, whereas students who reported being bullied by other students less frequently (or never) were assigned a value of 0 on this variable. In addition to bully and victim status variables, outcome measures tapping dual-status youth (i.e., “bully-victims”) as well as “bully only” youth and “victim only” youth were also created in order to examine differences in the influence of diet across different categories of bully victimization and perpetration (Craig et al., 2009). Youths who were found to have both bully status and victim status (in line with the coding scheme above) were designated as bully-victims; youths who were perpetrators, but not victims, were designated as “bully only”; youths who were victims, but not perpetrators, were designated as “victim only”.

The measure of diet quality is comprised of four items asking how many times a week participants usually eat 1) fruits, 2) vegetables, 3) sweets (e.g., candy, chocolate), and 4) Coke or other soft drinks that contain sugar. Response options to each of these items include never (0), less than once a week (1), once a week (2), 2–4 days a week (3), 5–6 days a week (4), once a day (every day) (5), and more than once a day (every day) (6). Responses were reverse-coded on the fruit and vegetable items so that higher scores reflected lower diet quality. Subsequently, scores were summed across items (with possible scores ranging from 0 to 24). Finally, and in line with prior research (Seymour et al., 2003), participants were placed into diet quality categories based on their scores on the composite index. The first category, “Low Diet Quality”, includes participants who scored at or above one standard deviation above the mean on the composite low diet quality measure. The second category, “Average Diet Quality”, includes participants who scored within \pm one standard deviation from the mean on the composite low diet quality measure. The final category, “High Diet Quality”, includes participants who scored at or below one standard deviation below the mean on the composite low diet quality measure. Alternative coding of the composite dietary measure did not alter the substantive results of the study.

Age, sex, socioeconomic status (on a five point scale ranging from “not at all well off” to “very well off”), low school quality (a composite measure of 4 items reflecting lower scores on school acceptance, student kindness/helpfulness, student comradery, and school satisfaction; $\alpha = 0.70$), physical activity (number of days a week engage in moderate to vigorous physical activity), overweight/obese (as determined by BMI), and screen-based sedentary activities (frequency of involvement in TV watching and video/computer gaming; $\alpha = 0.75$) were included as controls. Importantly, country dummy variables (with 1 reference category) were also included as covariates to account for country-level fixed effects that might be significant predictors of diet or bullying scores (e.g., cross-cultural differences in the meaning or interpretation of bullying).

The analysis proceeded in a series of steps. First, descriptive statistics pertaining to the sample on key variables of interest were calculated and discussed. Next, logistic regression techniques were employed to examine the associations between diet quality, bully status, and victim status among the full sample of participants. Subsequently, logistic regression was also used to examine whether associations between diet quality and bullying differ across more precise bully/victim statuses. Specifically, the link between diet quality and the odds of being a bully-victim, a bully only, or a victim only were examined. Finally, these same steps were executed in ancillary analyses that partition the sample into very developed and developed nations (as per the 2005 United Nations rankings on the Human Development Index; <http://hdr.undp.org>) in an effort to examine any variation in the associations between diet quality and bullying across countries with different human development profiles. Significant differences in coefficients

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