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An investigation of the association between foster care, body image, and BMI: A propensity score analysis

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ABSTRACT

Research suggests body image can be related to physical, mental, and sexual health. Youth in foster care experience disparities in all three of these areas. However, research exploring body image among foster youth is scant. This study assessed the association between foster care, BMI, and body image among a matched sample from a nationally representative dataset. In bivariate analysis, youth in foster care had significantly higher BMI and reported more frustration with their appearance than the matched sample of non-foster care youth. However, in models controlling for BMI, foster care had non-significant associations with body image. Implications are discussed.

1. Introduction

Research has established relationships between body image and health. For example, poor body image is related to eating disorders, depression, and sexual behaviors (Fredrickson & Roberts, 1997; Gillen, 2015; Ramseyer Winter & Satinsky, 2014; Woertman & van den Brink, 2012). Youth in foster care experience extreme health disparities in the U.S. (e.g., Ramseyer Winter, Brandon-Friedman, & Ely, 2016), but how foster care status relates to body mass index (BMI) and body image has not been sufficiently explored. Given foster youths' health disparities, an understanding of if and how body image and BMI are related to foster care could have implications for health-related interventions. As such, the goal of this study was to assess the impact that foster care status and BMI have on body image among a matched sample of foster youth and non-foster youth. There is little existing literature on body image among adolescent foster youth. As such, the following will review body image among youth, trauma and body size, and then establish a relationship between body image and health.

1.1. Body image among youth

Body image is a complex, subjective construct referring to a person's cognitive and emotional perceptions and evaluation of their body (Faccio, 2013). Body image is often subject to psychosocial influences, which can be impacted by the developmental processes youth experience from childhood through emerging adulthood (Gendron & Lydecker, 2016). As such, youth body image can significantly affect all aspects of development and impact their eventual functionality as adults. Perspectives of the ideal body are not always consistent across race but, instead, are bound by cultural ideals often associated with race and gender (Olvera, McCarley, Rodriguez, Noor, & Hernández-Valero, 2014). For example, White preadolescent boys and girls and Hispanic girls are more likely to have poor body image and believe their ideal body is thin, whereas boys raised in Hispanic communities are more likely to have a positive body image and prefer a larger or curvier body type (Olvera et al., 2014). As youth age out of childhood into adolescence, greater differences in ideal body type and body image are seen among different races and ethnicities (Epperson, 2014). Body image differences among race, culture, and age variables are consistent with developmental concerns and suggest some youth populations may be impacted by negative body image more than others.

1.2. Trauma and body size

Various forms of trauma are related to higher BMI during childhood and adolescence. For example, Gooding, Milliren, Austin, Sheridan, and McLaughlin (2015) found that exposure to violence during childhood is related to higher BMI among adolescents. Sexual abuse, the most common form of abuse with the greatest effect on youth development, (Trickett, Kim, & Prindle, 2011; Wekerle, Goldstein, Tanaka, & Tonmyr, 2016) is also related to larger BMI (Noll, Zeller, Trickett, & Putnam, 2007). Childhood neglect and physical abuse have also been associated

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with higher BMI (Shin & Miller, 2012). Related to trauma, youth in foster care are more likely to be on psychotropic medications, which are related to higher BMI (Allaire, Raghavan, & Brown, 2016). These various forms of trauma and the use of psychotropic medications being related to higher BMI is relevant for foster youth, as being in foster care is also associated with youth having a higher BMI (O'Dare Wilson & Scott, 2016; Schneiderman, Arnold-Clark, Smith, Duan, & Fuentes, 2013) and greater BMI is associated with higher levels of negative body image (e.g., Schwartz & Brownell, 2004).

As it is known that the majority (up to 90%) of foster youth experience trauma (e.g., Leslie, Hurlburt, Landsverk, Barth, & Slymen, 2004; Stein et al., 2001), we hypothesize foster youth may be more likely to experience negative body image than non-foster youth. As body image may be directly associated with various indicators of health, this is a crucial area of research.

1.3. Health and body image

Body image is associated with several physical, mental, and sexual health indicators. Engaging in excessive dieting may indicate a poor body image, whereas engaging in protective health behaviors, such as exercising, is associated with positive body image (Epperson, 2014; Gillen, 2015). While excessive or constant dieting behavior is associated with poor body image and more common in Latino and African American adolescents than White youth, having a lower BMI is significantly associated with having a positive body image (Gillen, 2015; Epperson, 2014). Regarding mental health, researchers have established associations between body image and depression, self-esteem, and eating disorders with some determining depression, self-esteem, and eating behavior to be mental health indicators of body image (Gillen, 2015; Tylka, 2011). Research also suggests body image is related to sexual health. For example, risky sexual health behaviors, such as early sexual debut and unprotected sex with numerous sexual partners, have been associated with negative body image (Woertman & van den Brink, 2012). Inversely, preventive sexual health behaviors have been associated with having a positive body image (Ramseyer Winter, 2017). The intersectionality of physical, mental, and sexual health with body image highlights the significance of poor body image on all aspects of health.

1.4. Current study

The purpose of the current study is to examine associations between BMI and body image among a matched sample of foster youth and non-foster youth. Based on existing literature, we hypothesized that youth in foster care would have a significantly higher BMI than non-foster youth and youth in foster care would significantly predict worse body image.

2. Materials and methods

2.1. Participants

We utilized the Health Behavior in School-Aged Children (HBSC) survey from the 2009–2010 school year (Iannotti, 2013). This is one of few nationally representative datasets that includes body image-related measures and identifies foster youth. It includes 12,642 students in grades 5th through 10th from 314 schools across the United States, of which 48.5% were girls, 52.1% identified as White, 20.3% as African American, and 26.9% as Hispanic/Latino. The average age was 13.0 (SD = 1.8), and average BMI was 21.2 (SD = 4.6). Of all participants, 56 (0.4%) indicated they were currently living in foster care. We utilized propensity score matching (PSM) to construct a comparison group of youth who were not in foster care but were similar on key covariates (PSM procedures and results are described below). The final matched sample included 112 youth; 56 youth who identified as being in foster care, and 56 youth not in foster care (Table 1).

Table 1
Demographic descriptives of original dataset and matched sample.

	Original sample		Matched sample	
	FC (n = 56)	Non-FC n = (12,586)	FC (n = 56)	Non-FC (n = 56)
Gender - Female	46.4%	48.6%	46.4%	46.4%
Age	14.1	12.9	14.1 (1.9)	14.1 (1.8)
Family affluence scale	5.1	5.9	5.1 (2.2)	5.2 (2.1)
White	41.1%	52.1%	41.1%	37.6%
Black	37.5%	20.2%	37.5%	37.5%
American Indian	14.3%	5.1%	14.3%	14.3%
Asian	12.5%	5.4%	12.5%	12.5%
N. Hawaiian	5.4%	1.8%	5.4%	5.4%
Hispanic	35.7%	28.6%	36.1%	36.1%

FC = foster care youth; Non-FC = non-foster care youth.

2.2. Measures

There were six dependent variables related to feelings about one's body: a) *I am frustrated with my appearance,* b) *I am satisfied with my appearance,* c) *I hate my body, d) I feel comfortable with my body,* e) *I feel anger toward my body, and* f) *I like my appearance in spite of flaws.* Response options were on a 5-point Likert scale of strongly agree (1) to strongly disagree (5). Lower scores indicated poorer body image on items a, c, and e; while higher scores indicated poorer body image on items b, d, and f. BMI was computed using the participant's self-reported height and weight measurements. Covariates included race/ethnicity, gender, age, and family affluence. The family affluence scale was computed by the HBSC study using two different questions and had a range of 0 to 9: 1) *How well off do you think your family is (Very well off, Quite well off, Average, Not very well off, Not at all well off)? 2) During the past 12 months, how many times did you travel away on vacation with your family (Not at all, Once, Twice, More than twice)?*

2.3. Analytic strategy

Analyses were conducted using R Version 1.0.136. Of the 12,642 students, 30% had missing data on at least one variable; 7.3% were missing demographic covariates and 19.6% were missing BMI. Missingness on the body image dependent variables was similar among the six items and ranged from 6.3% to 7.3%. The pattern of missingness appeared to be missing at random (MAR), as there were no significant differences in rates of missingness on these variables by group status (foster care versus not in foster care). In simulation studies, multiple imputation (MI) generally outperforms other approaches in resolving missing data, such as listwise deletion and mean substitution, which can lead to bias and falsely identified significant differences (Croy & Novins, 2005). MI creates multiple complete datasets based on the observed values. According to simulation studies, 40 imputations are optimal when missing 20% on any one variable (Graham, Olchowski, & Gilreath, 2007). Thus, for this study, we fully imputed 40 databases using the MI chained equations procedure. All variables with missing data in the analysis were imputed, except for the six body image variables as these were considered the main dependent variables.

An omnibus chi-square test of independence was run to assess overall differences between the foster care and non-foster care groups on gender, age, race/ethnicity, gender, and affluence. This test was statistically significant indicating that there were differences on these variables between the foster care and non-foster care youth. A standardized difference test, or a post-hoc analysis, was run to determine which specific variables had differences between the two groups. Significant imbalances existed on affluence, age, and race categories.

Given that the purpose of this study was to examine the effect that specifically foster care has on body image, we used PSM to identify non-foster care youth that most resembled the youth in foster care. Youth in