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Brief Report

Brief Report

Community Norms for the Eating Disorder Examination Questionnaire (EDE-Q) among Cisgender Gay Men

Short Running Title: Eating Disorder Norms in Gay Men

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Community Norms for the Eating Disorder Examination Questionnaire (EDE-Q) among Cisgender Gay Men

Abstract

Objective: Prior norms of the Eating Disorders Examination Questionnaire (EDE-Q) among men have not considered sexual orientation. This study's objective was to assess EDE-Q community norms among cisgender gay men.

Method: Participants were 978 self-identified cisgender gay men from The PRIDE Study recruited in 2018.

Results: We present mean scores and standard deviations for the EDE-Q among cisgender gay men ages 18-82. Among cisgender gay men, 4.0% scored in the clinically significant range on the Global Score, 5.7% on the Restraint, 2.1% on the Eating Concern, 10.5% on the Weight Concern, and 21.4% on the Shape Concern subscales of the EDE-Q. The Global Score as well as Weight and Shape Concerns in a young adult subsample (18-26 years) from The PRIDE Study were higher than previously reported norms in young men (Lavender, 2010). Participants

reported any occurrence (≥1/week) of dietary restraint (19.8%), objective binge episodes (10.9%), excessive exercise (10.1%), laxative misuse (1.1%), and self-induced vomiting (0.6%). Binge eating, excessive exercise, and self-induced vomiting in The PRIDE Study subsample were lower than previously reported in young men.

Discussion: We provide EDE-Q norms among cisgender gay men, which should aid clinicians and researchers to interpret the EDE-Q scores of cisgender gay men.

Keywords: eating disorder, gay, homosexuality, sexual minority, body image, disordered eating, norms

Highlights

- We present norms for the Eating Disorder Examination Questionnaire among cisgender gay men.
- Cisgender gay men scored in the clinically significant range for Shape Concerns (21%) and Weight Concerns (11%).
- Participants reported weekly or more occurrences of dietary restraint (20%), objective binge episodes (11%), and excessive exercise (10%)

Introduction

Most empirical eating disorder (ED) research is skewed towards populations of women with less than 1% of all published ED research relating specifically to men (Murray et al., 2017). Despite this skew, emerging evidence suggests that EDs are increasingly prevalent in men (Mitchison & Mond, 2015) and have disease burden and medical risk comparable to that of women (Murray et al., 2017). Accordingly, an increasing research impetus has been oriented towards EDs in men, both in terms of improving detection and optimizing treatment. However, men may have unique ED-related concerns, such as muscularity versus thinness-oriented body image ideals (Darcy, Hardy, Lock, Hill, & Peebles, 2013; Murray et al., 2017). As such, revised normative data are required to ensure appropriate measure interpretation in men (Lavender, De Young, & Anderson, 2010).

While revised norms for commonly used measures of ED symptomatology – such as the Eating Disorder Examination Questionnaire (EDE-Q; (Fairburn & Beglin, 2008) – have been put forth for men in clinical and community (*i.e.*, non-clinical) settings (Hilbert, de Zwaan, & Braehler, 2012; Lavender et al., 2010; Quick & Byrd-Bredbenner, 2013; Reas, Øverås, & Rø, 2012; Smith et al., 2017), these revised norms have not considered the respondents' sexual orientation. While evidence suggests an association between gay sexual orientation and elevated disordered eating in men (Austin et al., 2009; Calzo, Jerel P., Austin, & Micali, 2018; Matthews-Ewald, Zullig, & Ward, 2014), there is limited evidence that gay sexual orientation is a direct risk factor in the development of EDs among men (Siever, 1994). In one study, gay adolescent

boys in high school were more likely to perceive themselves as overweight when they were normal weight (Hadland, Austin, Goodenow, & Calzo, 2014). Gay undergraduate men had a higher incidence of body dissatisfaction and a drive for thinness than their heterosexual counterparts (Carper, Negy, & Tantleff-Dunn, 2010). Sexual orientation-specific community norms may contribute to unique appearance ideals that further potentiate ED risk among gay men (Murray et al., 2017). The development of specific norms for ED attitudes and behaviors among gay men is an important endeavor that may better contextualize research in this population. The aim of the present study was to therefore report community norms for the EDE-Q, the field's most widely used ED symptom measure, among cisgender gay men (*i.e.*, gay men who were assigned male sex at birth and have a gender identity of man).

Methods

Study Population

The PRIDE Study is a large-scale national longitudinal cohort study of sexual and gender minority (SGM) adults which include but are not limited to people who identify as lesbian, gay, bisexual, transgender, and/or queer (LGBTQ) in the US. The PRIDE Study launched in 2017, and data were collected on a secure, cloud-based, web-responsive platform accessible from any computer, tablet, or smartphone. PRIDEnet, a national network of organizations and individuals, was created to actively engage SGM communities in all stages of research for The PRIDE Study. Participants in The PRIDE Study were recruited through PRIDEnet constituents, digital communications (blog posts, newsletters), distribution of The PRIDE Study-branded

promotional items, in-person outreach at conferences and events, social media advertising, and word-of-mouth. Additional details about The PRIDE Study research platform, recruitment, and design have been previously described (Lunn, Lubensky et al., 2019; Lunn, Capriotti et al., 2019). All PRIDE Study participants were invited to complete the 'Eating and Body Image' questionnaire from April 2018 to August 2018. For this analysis, we included participants who reported a male sex assigned at birth, exclusively indicated 'man' as their gender identity, and exclusively indicated 'gay' as their sexual orientation (Appendix A). Participants who reported multiple gender identities or sexual orientations were excluded. Of the 10,665 participants in The PRIDE Study at that time, 4,285 completed the questionnaire. Of these, 1,090 identified as cisgender gay men. However, due to the presence of missing values, only data from 978 cisgender gay men were included in the current study. No compensation was received for questionnaire completion. This study was approved by the XX Institutional Review Boards as well as The PRIDE Study's Research Advisory Committee and Participant Advisory Committee.

Measures

The EDE-Q is a self-report questionnaire that assesses disordered eating attitudes and behaviors over the previous 28 days (Fairburn & Beglin, 2008). The measure provides a Global score and four subscale scores: Restraint, Eating Concern, Shape Concern, and Weight Concern. Responses are on a 7-point scale; higher scores reflect greater eating-related concerns or behaviors. Frequencies of disordered eating behaviors (*e.g.*, binge eating, compensatory behaviors) are assessed. In this study, Cronbach's alpha was .93 for the Global score, .78 for the

Restraint subscale, .82 for the Eating Concern subscale, .82 for the Weight Concern subscale, and .89 for the Shape Concern subscale.

The frequency of binge eating and compensatory behaviors were assessed in terms of the number episodes occurring during the past four weeks (28 days), in accordance with previous literature (Lavender et al., 2010; Penelo, Villarroel, Portell, & Raich, 2012). Any occurrence was defined as ≥1 episode in the past 28 days. Regular occurrence of dietary restraint was defined as going for long periods of time (≥8 h) without eating anything to influence shape or weight for ≥13 days over the past 28 days (EDE-Q Item 2). Regular occurrence of excessive exercise was defined as exercising in a driven or compulsive way as a means of controlling weight, shape or amount of fat, or burning off calories for ≥20 days over the past 28 days. For all other behaviors (objective binge episodes, self-induced vomiting, and laxative misuse), regular occurrence was defined as ≥4 occurrences over the past 28 days.

Sociodemographic information (age, race/ethnicity, education), weight, and height were based on self-report. Body mass index (BMI) was calculated using the standard formula weight (kilograms) divided by height (meters) squared (BMI = weight/height^2). Participants were asked: "Has a mental health professional or physician ever told you that you have an eating disorder such as anorexia nervosa, bulimia nervosa, or binge eating disorder?" If affirmative, participants were asked to specify which type. Options included anorexia nervosa, bulimia nervosa, binge eating disorder, or other/not specified.

Data Analysis

SPSS 20.0 was used for all analyses and STATA 15.0 was used for figures. Consistent with previous studies (Lavender et al., 2010; Luce, Crowther, & Pole, 2008; Machado, Machado, Gonçalves, & Hoek, 2007), a cut-off score of ≥ 4 as a marker of clinical significance (range 0-6; higher scores indicate greater symptoms) was used for the Global score and each of the four EDE-Q subscales. Associations between participant's BMI and EDE-Q (Global score and subscale scores) were assessed through the Pearson product-moment correlation coefficient. We calculated norms in a subset (n=178) of young adult cisgender gay men from The PRIDE Study (ages 18-26 years) in order to compare norms to those previously published in young adult men (Lavender *et al.*, 2010). We chose Lavender *et al.* (2010) as a comparison group as it was the sample of men with published EDE-Q norms that most closely matched The PRIDE Study (*i.e.*, US-based, non-clinical, adult sample). However, Lavender *et al.* (2010) did not assess sexual orientation; some gay men may have been included. We are unaware of EDE-Q norms published in an exclusively heterosexual community sample of men. Z-tests or Fisher's exact tests were conducted comparing the proportions of individuals who reported each ED behavior, and independent samples t-tests were used to compare the Global and subscale scores. Locally-weighted scatterplot (lowess) smoothing curves were created to visualize the relationship between age and EDE-Q Global and subscale scores given the wide age range of the sample. Two-tailed tests with a *p*-value were set at .05 for significance.

Results

A total of 978 gay cisgender men were included in this study. The median age was 38.9 years (range 18-82). Mean BMI was 27.1 kg/m^2 (*SD*=6.3). A total of 80.5% of the participants identified as White, 1.8% as Black/African American, 6.3% as Hispanic/Latino, 3.2% as Asian or Pacific Islander, 0.6% as Native American/American Indian, and 7.6% as another race or multiracial. In addition, 77.2% of participants had completed a college degree or higher. Overall, 2.9% of participants reported being told by a mental health provider or physician that they had an eating disorder, including anorexia nervosa (1.5%), bulimia nervosa (0.7%), binge eating disorder (0.9%), or other/not specified (0.4%).

Mean scores, standard deviations, and percentile ranks for the EDE-Q subscales and Global Score are presented in Table 1. Among cisgender gay men of all ages, 5.7% scored in the clinically significant range on the Restraint subscore, 2.1% on the Eating Concern subscore, 10.5% on the Weight Concern subscore, 21.4% on the Shape Concern subscore, and 4.0% on the Global score. BMI was found to be positively associated with EDE-Q scores including Restraint (r = .16, p < .001), Eating Concern (r = .28, p < .001), Weight Concern (r = .42, p < .001), Shape Concern (r = .33, p < .001), and Global (r = .35, p < .001).

Any occurrence (≥ 1/week) and regular occurrences (≥ 2/week) of key ED behavioral features and compensatory behaviors among cisgender gay men of all ages are presented in Table 2. Any occurrence of dietary restraint during was observed for almost 20% of the participants, while approximately 11% of the participants endorsed any episode of objective

binge eating and excessive exercise. Any occurrence of self-induced vomiting (0.6%) and laxative misuse (1.1%) were rarely observed.

Attitudinal subscales and behavioral features of a subsample of young adult cisgender gay men (ages 18-26) from The PRIDE Study sample (n=178) are shown in Table 3. The young adult cisgender gay men in The PRIDE Study scored higher than the Lavender *et al.* (2010) sample on the Weight Concern and Shape Concern subscales as well as the Global score. No significant differences were observed between the young adult cisgender gay men subsample of The PRIDE Study and the young adult men in the Lavender *et al.* (2010) sample for the Restraint and Eating Concern subscales.

There were no differences between the proportion of young adult cisgender gay men in The PRIDE Study and the proportion of the Lavender *et al.* (2010) sample for dietary restraint behaviors and laxative misuse. However, young adult cisgender gay men in The PRIDE Study endorsed significantly lower rates of objective binge episodes and excessive exercise compared to the Lavender *et al.* (2010) sample. In addition, compared to a 3.2% rate the Lavender *et al.* (2010) sample, no participant from the young adult cisgender gay men subsample in The PRIDE Study endorsed self-induced vomiting.

Lowess smoothing curves demonstrate the relationship between age and EDE-Q Global and subscale scores (Figures 1-5). In general, the relationship between age and EDE-Q scores were inverse U shaped, with lowest EDE-Q scores were observed in early young adulthood and late adulthood, with the highest scores in middle adulthood.

Discussion

We summarize community norms for the EDE-Q, a measure of ED attitudes and behaviors, among cisgender gay men. To our knowledge, this is the first study to report community norms of the EDE-Q among cisgender gay men. The few prior studies to report EDE-Q norms in male populations did not assess sexual orientation and were presumably predominantly cisgender heterosexual samples (Hilbert et al., 2012; Lavender et al., 2010; Quick & Byrd-Bredbenner, 2013; Reas et al., 2012).

We found relatively high Weight Concerns and Shape Concerns subscale scores among cisgender gay men in The PRIDE Study. These findings are consistent with the growing literature demonstrating body image and ED-related concerns in sexual minority populations (Austin et al., 2009; Calzo, Jerel P. et al., 2018; Diemer, Grant, Munn-Chernoff, Patterson, & Duncan, 2015; Nagata, Garber, Tabler, Murray, & Bibbins-Domingo, 2018; Tabler, Schmitz, Geist, & Nagata, 2019; Watson, Adjei, Saewyc, Homma, & Goodenow, 2017). However, greater endorsement of the attitudinal components of ED symptomatology by gay men did not necessarily equate to greater disordered eating behaviors. EDE-Q norms studies in other populations have demonstrated differences in ED attitudes and behaviors (Lavender et al., 2010; Luce et al., 2008). In addition, some cisgender gay men may have weight and shape concerns related to muscularity and bulking up (Calzo, J. P., Corliss, Blood, Field, & Austin, 2013). This may not be reflected in the disordered eating behaviors measured by the EDE-Q, which may be

more oriented towards thinness and weight loss. While a greater constellation of body image concerns was reported in our sample, it is important not to overestimate how this translates to ED behaviors among gay men. This underscores the importance of sexual orientation-specific norms when interpreting EDE-Q findings in sexual minority populations.

The minority stress theory may explain the high levels of attitudinal ED symptomatology among gay men compared to their heterosexual counterparts. Prejudice and stigma directed towards sexual minorities bring about unique stressors which can cause adverse health outcomes including mental health disorders (Meyer, 2003). Gay men with eating disorders have been noted to have high psychiatric comorbidity including depression and anxiety (Feldman & Meyer, 2010; Tabler et al., 2019; Woodside et al., 2001). Disordered eating behaviors may represent deleterious coping with minority stress. Gay men may be more likely to view their bodies as sexual objects, to aim to sexually attract others, and therefore may be more vulnerable to experiencing body dissatisfaction compared to heterosexual men (Siever, 1994); this may be a response to minority stress.

We found lower rates of self-induced vomiting and laxative misuse among young cisgender gay men from The PRIDE Study compared to the sample of young men previously reported by Lavender *et al.* (2010). Some cisgender gay men may have greater desire for muscularity than their heterosexual counterparts, (Calzo, J. P. et al., 2013) which may make them less likely to engage in purging behaviors for weight loss. It is important to note that rates of vomiting and laxative misuse in both samples were relatively low. These differences may also

reflect different samples (Lavender *et al.* 2010 was undergraduate students at a single university) and time periods, as purging behaviors in men may be decreasing over time (Stephen, Rose, Kenney, Rosselli-Navarra, & Weissman, 2014). This contrasts with findings reporting high rates of purging and laxative misuse in gay adolescent boys compared to their heterosexual counterparts (Austin et al., 2009; Austin, Nelson, Birkett, Calzo, & Everett, 2013; Diemer et al., 2015; Watson et al., 2017).

There are limitations to this study. ED assessment in a convenience sample recruited via a web-based platform may limit generalizability but may also enhance responsiveness to a query on a sensitive topic area. Our sample was highly educated, mostly White, and may not be representative of all cisgender gay men in the US. Selection bias is possible as individuals with more health problems may be more likely to participate in health studies. There are limitations to using the Lavender *et al.* (2010) sample as a comparison group as these were young adult men in which sexual orientation was not assessed, although we would presume a low overall number of gay men in an undifferentiated sample.

Given that gender identity and sexual orientation disparities are increasingly recognized, establishing normative data for cisgender sexual minority men – such as those who identify as gay – will enable clinicians and researchers to interpret the EDE-Q scores among cisgender gay men. Additional research examining ED-related norms in other sexual minority populations, such as bisexual men, is warranted.

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Table 1. Distribution of means, standard deviations, and percentile ranks for Eating Disorder Examination Questionnaire (EDE-Q) Global and subscale scores among cisgender gay men from The PRIDE Study (N = 978).

	EDE-Q R	EDE-Q EC	EDE-Q WC	EDE-Q SC	EDE-Q Global
M (SD)	1.54 (1.43)	0.63 (0.98)	1.91 (1.47)	2.41 (1.62)	1.62 (1.17)
Range	0-6.00	0-6.00	0-6.00	0-6.00	0-5.55
Percentile rank					
5	-	-	-	0.125	0.11
10	-	-	-	0.5	0.26
15	-	-	0.2	0.63	0.39
20	-	-	0.4	0.75	0.51
25	0.2	-	0.6	1	0.63
30	0.4	-	0.8	1.21	0.78
35	0.6	-	1	1.46	0.96
40	0.8	0.2	1.2	1.7	1.13
45	1	0.2	1.4	1.88	1.31
50	1.2	0.2	1.8	2.13	1.45
55	1.4	0.2	2	2.5	1.61
60	1.6	0.4	2.2	2.75	1.78
65	2	0.4	2.6	3	1.94
70	2.4	0.6	2.8	3.38	2.13
75	2.6	0.8	3	3.75	2.34
80	3	1	3.2	4	2.62
85	3.4	1.4	3.6	4.38	2.94
90	3.6	2	4	4.75	3.29
95	4	2.8	4.6	5.25	3.81
99	5.2	4.4	5.6	6	4.81

EDE-Q, Eating Disorder Examination-Questionnaire; R, Restraint subscale; EC, Eating Concern subscale; WC, Weight Concern subscale; SC, Shape Concern subscale; EDE-Q Global, Global score; M, Mean; SD, standard deviation.

Table 2. Proportion of cisgender gay men engaging in disordered eating behaviors among 978 individuals participating in The PRIDE Study

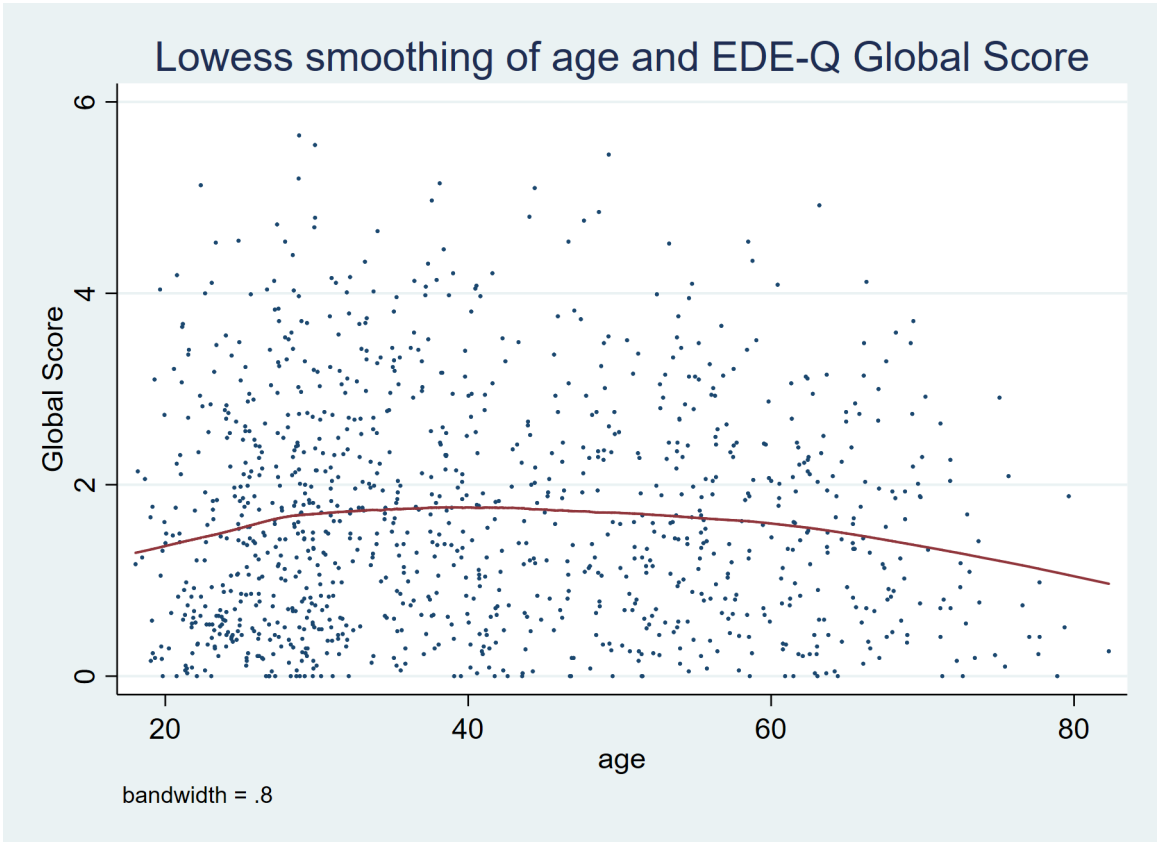
Disordered eating behavior	Any occurrence		Regular occurrence	
	%	n	%	n
Dietary restraint	19.8	194	4.9	48
Objective binge episodes	10.9	107	5.7	56
Self-induced vomiting	0.6	6	0.4	4
Laxative misuse	1.1	11	0.8	7
Excessive exercise	10.1	99	2.0	20

Any occurrence was defined as ≥1 episode in the past 28 days. Regular occurrence of dietary restraint was defined as going for long periods of time (≥8 h) without eating anything to influence shape or weight for ≥13 days over the past 28 days (EDE-Q Item 2). Regular occurrence of excessive exercise was defined as exercising in a driven or compulsive way as a means of controlling weight, shape or amount of fat, or burning off calories for ≥20 days over the past 28 days. For all other behaviors (objective binge episodes, self-induced vomiting, and laxative misuse), regular occurrence was defined as ≥4 occurrences over the past 28 days (Lavender et al., 2010; Penelo et al., 2012).

Table 3. Comparisons of eating attitudes and disordered eating behaviors in a subsample of cisgender gay men 18-26 years old in The PRIDE Study (N=178) and young men from the Lavender *et al.* (2010) sample (N=404)

	The PRIDE Study	Lavender (2010)	
Eating Attitudes	Mean (standard deviation)		p
EDE-Q Global	1.36 (1.06)	1.09 (1.00)	0.002
EDE-Q Restraint	1.12 (1.30)	1.04 (1.19)	0.466
EDE-Q Eating Concerns	0.51 (0.77)	0.43 (0.77)	0.337
EDE-Q Weight Concerns	1.59 (1.36)	1.29 (1.27)	0.010
EDE-Q Shape Concerns	2.21 (1.53)	1.59 (1.38)	<0.001
Disordered eating behaviors	Any occurrence (%)		p
Dietary restraint	21.9	24.0	0.581
Objective binge episodes	8.4	25.0	<0.001
Self-induced vomiting	0.0	3.2	-
Laxative misuse	1.7	2.7	0.566
Excessive exercise	11.2	31.4	<0.001

EDE-Q, Eating Disorder Examination-Questionnaire. Any occurrence was defined as ≥1 episode in the past 28 days (Lavender et al., 2010; Penelo et al., 2012). EDE-Q scores were compared using independent samples t-tests. Proportions of disordered eating behaviors were compared with Z-tests or Fisher's exact tests.



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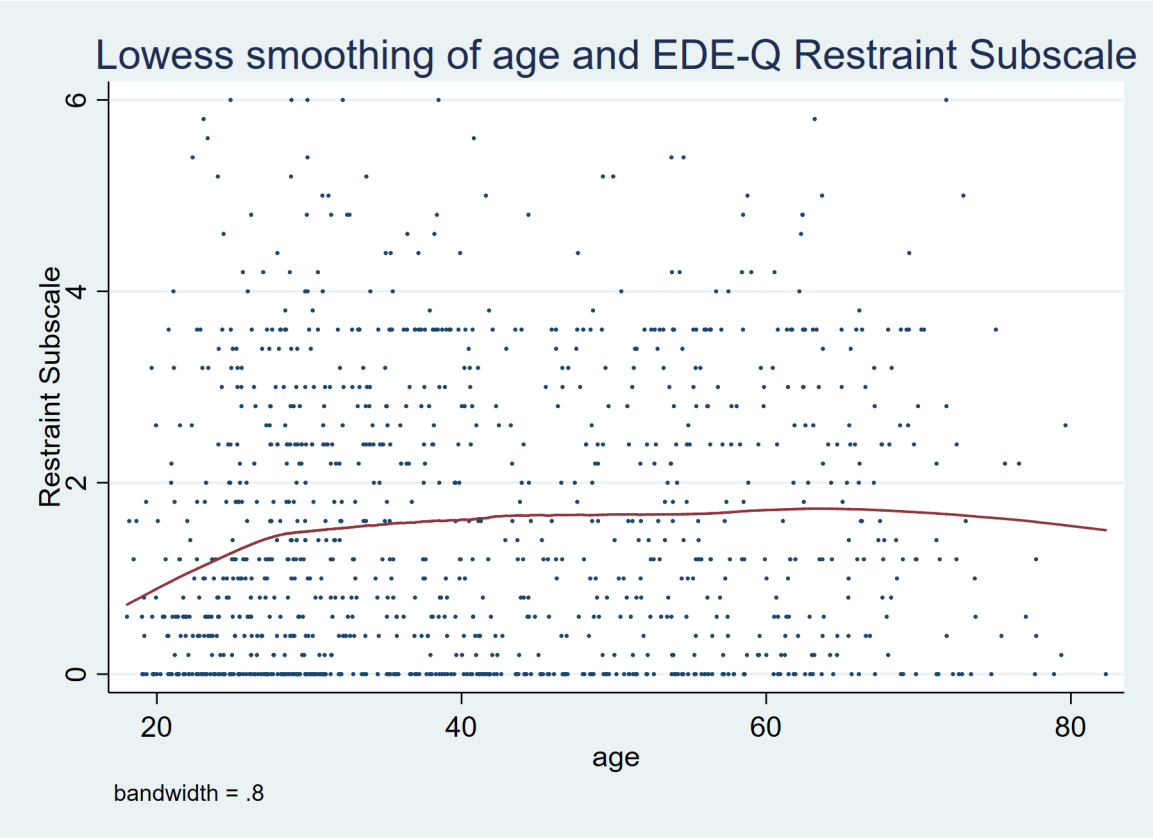

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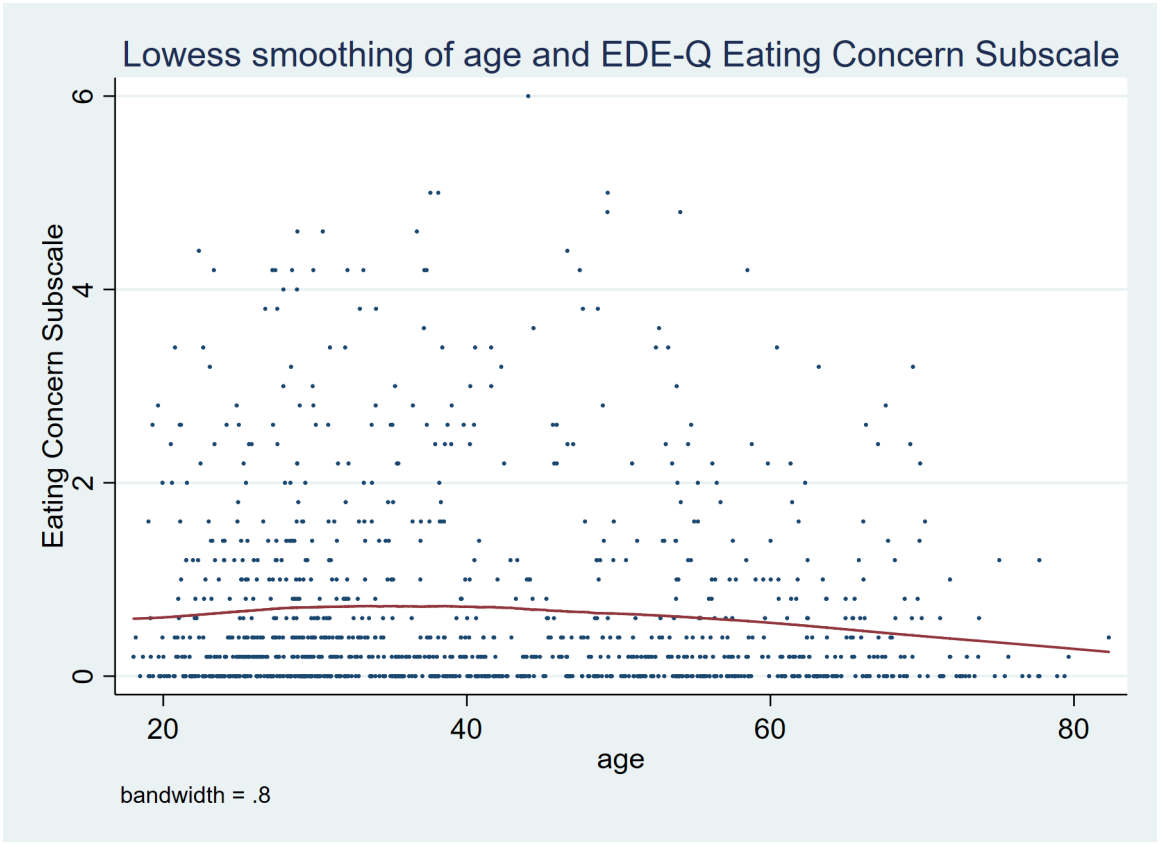

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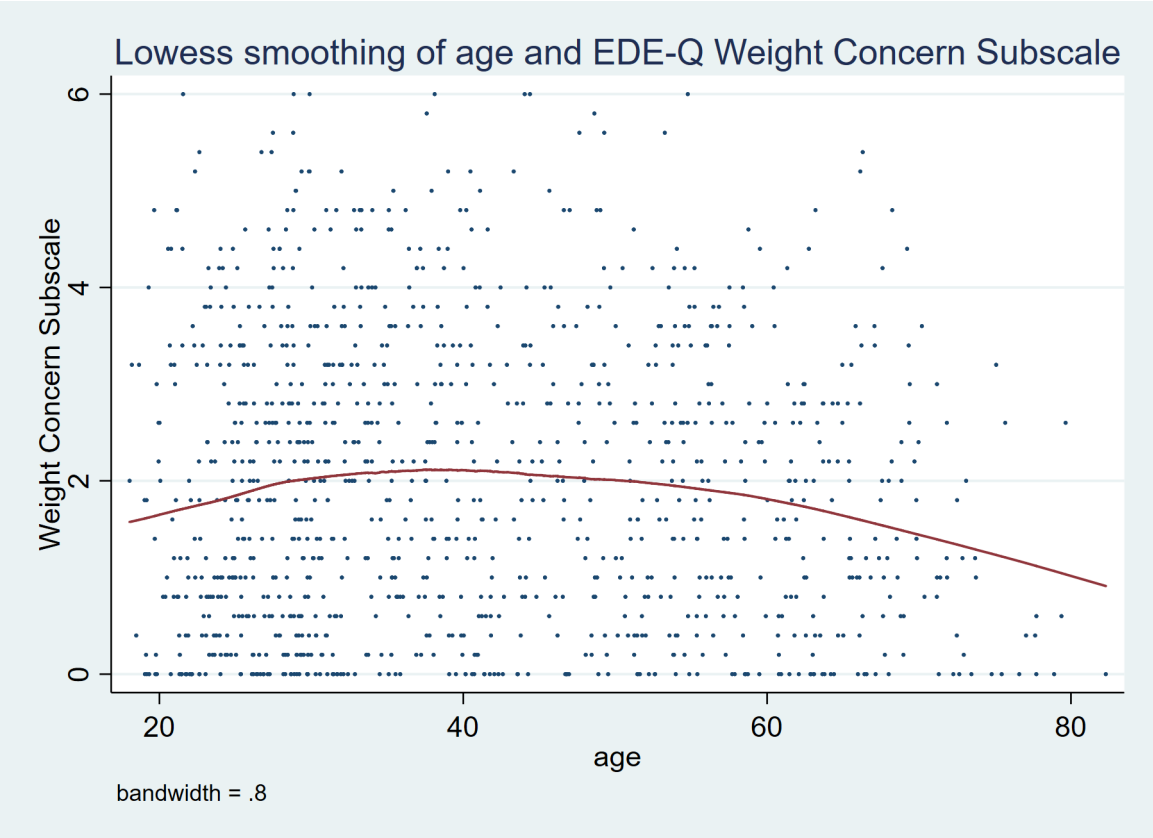

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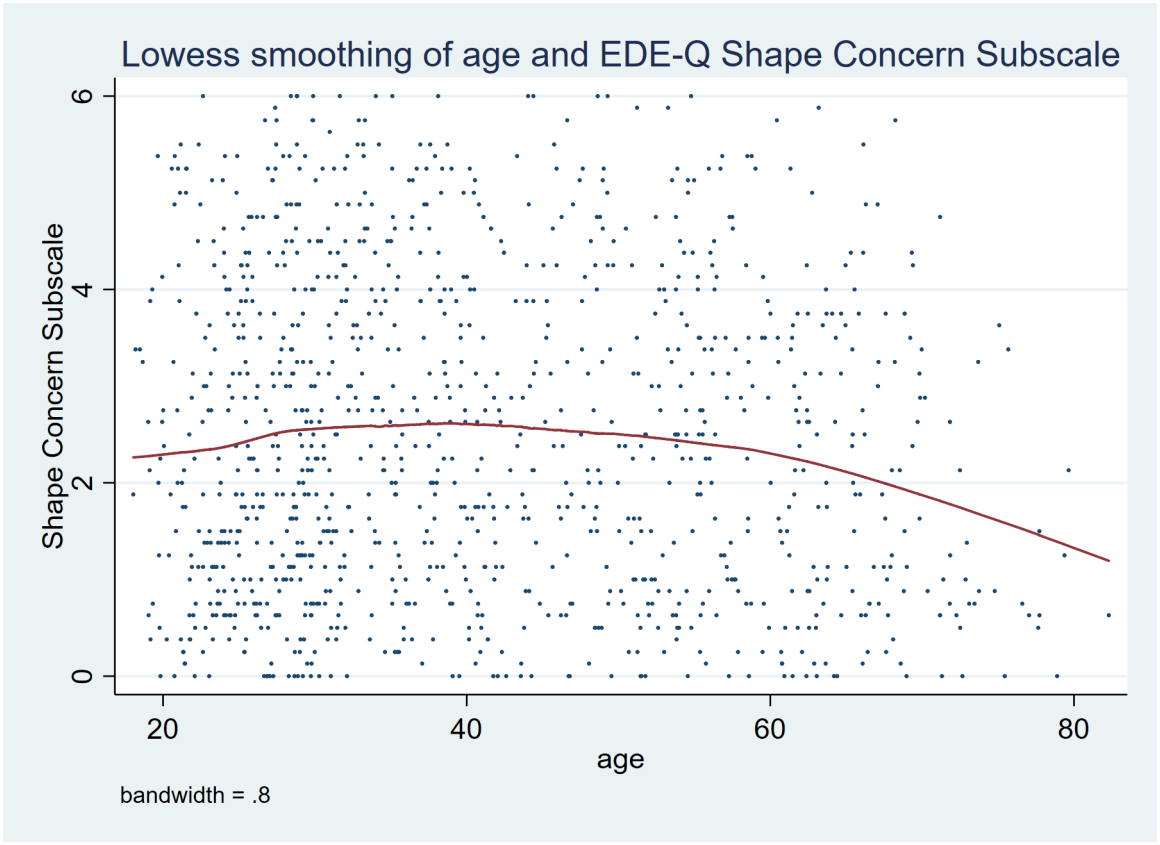

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