



Food addiction among sexual minorities



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ABSTRACT

Although sexual minorities represent a small proportion of the general population, this group has been observed to be at an increased risk of developing various pathologies, including substance use and eating disorders. Research suggests that foods high in added fat and refined carbohydrates may trigger an addictive response, especially in at-risk individuals. Consequently, food addiction is associated with elevated risk for obesity, diet-related disease, and psychological distress. However, there is limited research on whether food addiction, like substance use, may be elevated among sexual minorities, and whether self-compassion may be a protective factor. Thus, the current study aims to test whether food addiction is elevated in sexual minorities (relative to heterosexuals) and if discrimination and self-compassion may be related to food addiction among sexual minorities. In a community sample of 356 participants (43.3% sexual minority), sexual minorities had almost twice the prevalence of food addiction (16.9%) as heterosexuals (8.9%). Also, sexual minorities on average experienced more food addiction symptoms ($M = 2.73$, $SD = 1.76$) than heterosexuals ($M = 1.95$, $SD = 1.59$). For sexual minorities, heterosexual harassment was associated with increased food addiction, while self-compassion appeared to be a protective factor. Further research needs to examine between-group differences among sexual minorities for better treatment and interventions for food addiction.

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1. Introduction

Even though individuals that identify as sexual minorities represent a relatively small percentage of the general population (estimated prevalence gay 1%, lesbian 2.3%, bisexual 0.7–2.9%) (Carpenter, 2013), these groups compose a significant proportion of individuals who have mental and physical health conditions, including depression (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009; Bruce, Harper, & Bauermeister, 2015; Smith, Armelie, Boarts, Brazil, & Delahanty, 2016), eating disorders and problematic eating (Andersen, 1999; Austin et al., 2009; Carlat, Camargo, & Herzog, 1997; Harvey & Robinson, 2003; Russell & Keel, 2002), and weight problems. (Austin, Nelson, Birkett, Calzo, & Everett, 2013; Brand, Rothblum, & Solomon, 1992; Fredriksen-Goldsen, Kim, Barkan, Muraco, & Hoy-Ell, 2013; Guadamuz et al., 2012; Mason & Lewis, 2014). One particular area of concern is the increased prevalence of substance use disorders among sexual minorities (Weber, 2008). According to the Center for Substance Abuse Treatment [CSAT], lesbian, gay, and bisexual individuals are more

likely to use alcohol and other drugs and are at a greater risk of heavily using drugs into later adulthood (CSAT, 2001). Likewise, lesbian, gay, bisexual, and transgender (LGBT) youth and adults report more use of alcohol, tobacco, and other drugs than their heterosexual counterparts; and LGBT youth begin using drugs at younger ages than their heterosexual counterparts (Institute of Medicine, 2011, pp. 159–161).

The scientific understanding of addiction is changing. Substances that have the potential to induce addictive-like effects were once only believed to include items such as alcohol, tobacco, and other such drugs. However, there is increasing scientific interest in whether certain types of foods (e.g., high in added fat and refined carbohydrates) may be capable of triggering an addictive response for some individuals (Fortuna, 2012; Gearhardt & Brownell, 2013; Gearhardt, Grilo, DiLeone, & Potenza, 2011). Consistent with this hypothesis, substance addiction and problematic eating have related biological, psychological, and behavioral factors. For example, elevated craving, increased impulsivity, and heightened emotion dysregulation are associated with both overeating and excessive substance use (Gold, Frost-Pineda, & Jacobs, 2003). Biologically, the mesolimbic dopaminergic system plays a key role in both food intake and substance use, and dysfunction in this system contributes to overeating and substance use disorders (Volkow,

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Wang, Tomasi, & Baler, 2013).

The Yale Food Addiction Scale (YFAS; Gearhardt, Corbin, & Brownell, 2009; Gearhardt, Corbin, & Brownell, 2016) was developed to operationalize food addiction. The YFAS is a psychometrically valid measure that applies the diagnostic criteria for substance use disorders to the consumption of highly rewarding foods (e.g., chocolate, ice cream, pizza). Elevated scores on the YFAS are associated with higher rates of obesity, greater prevalence of dietary disease, increased episodes of binge eating, more intense food cravings, and greater inhibitory difficulties, as well as patterns of neural response and genetic alleles associated with substance use disorders (Meule & Kübler, 2012; Meule, de Zwaan, & Müller, 2017; Meule & Gearhardt, 2014; Davis et al., 2013).

The occurrence of food addiction ranges from 5.4% in a healthy community sample to 56.8% in a clinical sample of patients with obesity and binge eating disorder (Pursey, Stanwell, Gearhardt, Collins, & Burrows, 2014). Given the elevated risk for substance use disorders in sexual minorities (Weber, 2008), it is important to evaluate whether food addiction symptoms are also elevated for this group. However, the literature on the prevalence of food addiction among sexual minorities is scarce. One study that included 24 gay and bisexual male veterans found that these individuals had more food addiction symptoms than their heterosexual counterparts (Bankoff, Richards, Bartlett, Wolf, & Mitchell, 2016). Although this was observed, future research is needed, especially in community samples that contain both females and males, to further understand the association of food addiction and sexual orientation.

The elevated risk for addiction and substance use among sexual minorities is potentially related to experienced homophobia (Anderson & Henderson, 1985; Cabaj, 2000). For example, experiencing heterosexual harassment, rejection, and discrimination are significantly correlated with other measures examining psychological pathology, such as depression, anxiety, and overall psychological distress (Szymanski, 2006, 2009). Heterosexist harassment can be defined as various behaviors that include, but are not limited to, verbal insults, physical and sexual assault, and threats against those perceived to be sexual minorities (Herek, 1990). As a result of discrimination being correlated with significant mental health problems among sexual minorities, sexual minorities may be at a heightened risk of using addictive substances as a way to cope with various mental health consequences (Kelly, Davis, & Schlesinger, 2015; McCabe, Bostwick, Hughes, West, & Boyd, 2010; Cabaj, 2000; Weber, 2008). While sexual minorities are at an increased risk of using addictive substances, to our knowledge there are currently no studies that examine the relationship between experienced homophobia and food addiction among a community sample.

Although sexual minorities have been observed to be at heightened risks for experiencing substance use, self-compassion might be protective against the development of addictive disorders. Self-compassion may be defined as being kind to oneself and knowing that failures are an unavoidable experience among humanity (Brooks, Kay-Lambkin, Bowman, & Childs, 2012). It has been observed that individuals in the general public with high self-compassion have less extreme reactions, less negative emotions, less mental health issues, and more accepting thoughts (Leary, Tate, Adams, Allen, & Hancock, 2007; Miron, Orcutt, Hannan, & Thompson, 2014; Neff, 2003a; Neff, Kirkpatrick, & Rude, 2007). Self-compassion has been found to reduce the risk of alcohol and drug use disorders in the general population (Brooks et al., 2012; Neff, 2003a, 2003b; Rendon, 2007). Despite the potential protective effects of self-compassion (Greene & Britton, 2015; Jennings & Tan, 2014), no prior research to our knowledge has investigated the influence between self-compassion and addiction in general (nor

food addiction) among sexual minorities.

In the current study, we aim to address these gaps in the literature regarding the presence of food addiction in sexual minorities. Therefore, the current study investigates the prevalence of addictive-like eating in sexual minorities relative to heterosexuals in a community sample, as well as which factors (i.e., experienced discrimination, self-compassion) may be associated with an increased prevalence of addictive-like eating in sexual minorities. First, we hypothesize that, similar to other addictions and eating-related problems, food addiction will be higher for sexual minority participants than for their heterosexual counterparts. If sexual minorities exhibit higher rates of food addiction, this may highlight the importance of prevention and treatment efforts for this community. Second, we hypothesize that for sexual minorities, those with more experiences of discrimination will have more addictive-like eating. However, we predict that higher levels of self-compassion will be associated with fewer symptoms of food addiction, which may highlight the development of self-compassion as a potentially important intervention target.

2. Method

2.1. Procedure

This study was approved by the University of Michigan Health and Behavioral Sciences Institutional Review Board, and informed consent was gathered from participants before beginning the survey using Amazon Mechanical Turk (MTurk). MTurk has been shown to be comparable to traditional convenience samples (Paolacci & Chandler, 2014). To take the survey participants were required to live within the United States, be 18 years of age or older, and provide consent. Participants were compensated \$.25, similar to other MTurk studies of this involvement (Paolacci & Chandler, 2014). “Catch questions” were used to ensure that participants were actually reading the questions instead of just selecting random answers (e.g., “What does 2 + 2 equal?”).

Data for this study was gathered in two separate recruitment periods ($n = 231$ and 166 for the respective collection periods), due to the first sample of participants being 91.5% heterosexual and only 4.5% bisexual and 4.0% either gay or lesbian. For the second round of data collection, participants were prescreened ($n = 1918$) in order to only include sexual minorities. Of those prescreened, 166 reported being a sexual minority and were included in the sample. This second round of data collection included additional scales to examine sexual minorities’ experiences with harassment, rejection, discrimination, and self-compassion.

2.2. Participants

Of the participants recruited during the first round of data collection ($n = 231$), individuals were excluded for answering any of the “catch questions” incorrectly ($n = 10$). Of the participants recruited during the second round of data collection ($n = 166$), individuals were excluded because they had weight outlier data (i.e., BMI less than 15.0) ($n = 4$), had missing data ($n = 9$), declined to consent ($n = 1$), answered a “catch question” incorrectly ($n = 1$) reported that they were older than 1000 years old ($n = 3$), and as previously mentioned described their sexuality as “something else” other than gay, lesbian, and bisexual ($n = 12$) or reported that they “do not know” their sexuality ($n = 1$). This resulted in a total of 356 participants from both rounds of data collection (Aim 1), with 135 sexual minority participants from the second round of data collection (which also included assessments of heterosexual harassment, rejection, discrimination, and self-compassion (Aim 2)).

On average, for the total sample, participants were 34.94 years old ($SD = 13.03$, range 18–75). The sample was 35.1% male ($n = 125$), 64.3% female ($n = 229$), and 0.6% declined to answer ($n = 2$). Of this sample, the composition was 56.7% heterosexual ($n = 202$), 22.5% lesbian and gay ($n = 80$), and 20.8% bisexual ($n = 74$). The racial/ethnic distribution of this study was 85.4% White ($n = 304$), 7.9% Hispanic ($n = 28$), 4.5% African-American ($n = 16$), 3.9% Asian/Pacific Islander ($n = 14$), 1.4% American-Indian ($n = 5$), 0.3% Arab ($n = 1$), and 2% other ($n = 7$). The participants' body weights ranged from being underweight to severely obese (BMI range from 15.96 to 52.90) with the average BMI being in the category of overweight (mean BMI of 27.45 ± 6.79). Of our sample, 2.8% were underweight with a BMI of less than 18.5, 40.4% had a normal weight with a BMI between 18.5 and 24.9, 28.7% were overweight with a BMI between 25.0 and 29.9, and 28.1% were obese with a BMI greater than 30.0.

2.3. Assessments and measures

2.3.1. Yale Food Addiction Scale (YFAS)

Addictive-like eating was measured using the YFAS (Gearhardt et al., 2009). This scale was created using the criteria for substance dependence as defined by the DSM-IV (American Psychiatric Association, 2000) and assesses several constructs including loss of control around eating, unsuccessful attempts to quit, tolerance, withdrawal, and impairment. There are two scoring options for the scale: symptom count and diagnostic threshold. The symptom count is scored on a scale from 0 to 7, corresponding to the number of addictive-like symptoms met. The diagnostic threshold is met when a participant endorses three to more symptoms plus clinically significant impairment or distress. In the current study, question 25, which is a question used to examine the construct of attempts to cut down on food, was left out of the survey because of an error. However, this symptom is also assessed by three additional questions that were administered, which likely reduces the impact of this omission. In the current study, the average number of food addiction symptoms met was 2.28 ($SD = 1.71$) and 13.2% of participants met the food addiction threshold. The YFAS had good internal consistency in the current sample (Kuder-Richardson $\alpha = 0.75$).

2.3.2. Heterosexist harassment, rejection and discrimination scale (HHRDS)

Perceived heterosexist harassment, rejection, and discrimination among sexual minorities were measured using the HHRDS (Szymanski, 2006). This 14-item scale (Cronbach's $\alpha = 0.94$) assesses how often individuals experience harassment and rejection, workplace and school discrimination, and other discrimination due to their sexual orientation on a scale that ranges from 1 to 6 with higher scores meaning experiencing more harmful events. For the sexual minority sample, participants on average had a score of 1.62 ($SD = 0.80$).

2.3.3. Self-compassion scale (SCS)

Self-compassion was measured by using the 26-item SCS (Neff, 2003a). This scale was designed to measure the three main areas of self-compassion: 1) self-kindness versus self-judgement, 2) common humanity versus isolation, and 3) mindfulness versus overidentified with various negative emotions or beliefs. This measure is based off of a scale from 1 to 5 with higher scores meaning that the individual has more self-compassion. For the sexual minority sample, participants on average had a score of 2.79 ($SD = 0.75$). Reliability was good (Cronbach's $\alpha = 0.95$).

2.3.4. Demographics and BMI

Participants self-reported demographic information, such as their sex, sexuality, age, race/ethnicity, height, and weight. Their BMI score was calculated from the self-reported heights and weights.

2.4. Data analytic plan

To ensure sufficient power for the following analyses, sexual minorities were analyzed as an aggregate rather than individual groups (e.g. gay males, lesbians, and bisexuals) due to relatively small sample sizes. Data were first examined for normality and outliers. The distributions of BMI (1.14, $SE = 0.13$) and HHRDS (1.68, $SE = 0.21$) were positively skewed, thus analyses were performed with the log-transformed BMI and HHRDS data. No differences were seen, thus for clarity of interpretation, the reported results reflect the non-transformed BMI and HHRDS variables.

Table 1 includes descriptive information (e.g., sex, ethnicity, age, BMI) for each sexual orientation group. To identify covariates, we conducted one-way analysis of variance (ANOVAs) and chi-square analyses to determine whether demographic variables differed by sexual orientation. Levene's test of homogeneity of variances was violated for both age (Levene statistic (1,354) = 38.28, $p < 0.01$) and BMI (Levene statistic (1,354) = 6.26, $p = 0.01$), thus we used Welch's statistic to determine equality of means. Age was significantly different between sexual orientation groups (Welch (1350.75) = 45.61, $p < 0.01$) such that heterosexual participants were significantly older than sexual minorities. BMI, sex, and race/ethnicity did not significantly differ between sexual orientation groups (all $ps > 0.10$) (see Table 1).

To further assess for potential covariates, correlational analyses were conducted to examine associations between demographic variables (i.e., sex, ethnicity, age, BMI) and the dependent variable (i.e., food addiction symptoms). Age ($r = -0.21$, $p < 0.01$) and BMI ($r = 0.24$, $p < 0.01$) were significantly associated with symptom count and were included as covariates when testing Aim 1. Sex and race/ethnicity were not associated ($p > 0.40$) with amount of symptoms, and thus, were not included as covariates for Aim 1. When examining associations within the sexual minority group only, BMI was significantly associated with number of symptoms ($r = 0.27$, $p < 0.01$) and was included as a covariate for Aim 2. Sex, age, and ethnicity were not significantly associated with symptom count ($p > 0.20$) and were not examined as covariates for Aim 2.

To test Aim 1, a stepwise linear regression was conducted to examine whether sexual minorities endorsed more symptoms of food addiction than heterosexuals with and without controlling for

Table 1
Descriptive characteristics based on sexual orientation.

	Sexual Minority ($n = 154$)	Heterosexual ($n = 202$)
Sex		
Male	47 (30.5%)	78 (38.6%)
Female	106 (68.8%)	123 (60.9%)
Declined	1 (0.01%)	1 (0.01%)
Ethnicity		
White	122 (79.2%)	164 (81.2%)
African-American	5 (3.2%)	10 (5.0%)
Arabic	0 (0.0%)	1 (0.5%)
Asian/Pacific Islander	7 (4.5%)	4 (2.0%)
Hispanic	8 (5.2%)	10 (5.0%)
Mixed/Other	12 (7.8%)	13 (6.4%)
Age**	$M = 30.12$ ($SD = 9.69$)	$M = 38.62$ ($SD = 14.04$)
BMI	$M = 28.03$ ($SD = 7.63$)	$M = 27.00$ ($SD = 6.05$)
FA symptom count**	$M = 2.73$ ($SD = 1.76$)	$M = 1.95$ ($SD = 1.59$)
FA Diagnostic threshold*	27 (17.5%)	20 (9.9%)

Note: * $p < 0.05$, ** $p < 0.001$.

age and BMI. Sexual orientation (coded 0 = sexual minority, 1 = heterosexual) was included at step one, and age and BMI were entered at step two. In order to test whether sexual orientation was associated with food addiction status, a stepwise logistic regression was conducted with age and BMI entered as covariates in step 2.

Aim 2 was tested only within the sexual minority group. To test Aim 2, a stepwise linear regression was conducted to examine whether self-compassion (SCSS) and external discrimination (HHRDS) predicted symptoms of food addiction. SCSS and HHRDS were entered into the model at step 1, and BMI was included as a covariate at step 2. Similar to Aim 1, a stepwise logistic regression was used to explore whether SCSS and HHRDS were associated with food addiction status. Again, SCSS and HHRDS were entered into the model at step 1, and BMI was included as a covariate at step 2.

3. Results

3.1. Aim 1

Sexual orientation ($B = -0.78, p < 0.01$) was significantly associated with symptom count, such that sexual minorities were endorsing more symptoms than heterosexuals (See Table 1; Fig. 1). This association remained significant ($B = -0.52, p < 0.01$) when controlling for age ($B = -0.02, p < 0.01$) and BMI ($B = 0.06, p < 0.01$).

Analyses revealed that sexual orientation was also significantly associated with food addiction ($B = -0.66, p = 0.04$), such that sexual minorities were more likely to meet the diagnostic threshold for food addiction than were heterosexuals (see Table 1). However, when considering age and BMI as covariates, this relation was no longer significant ($B = -0.45, p = 0.19$), and only BMI ($B = 0.06, p < 0.01$) was associated with food addiction “diagnosis.”

3.2. Aim 2

Within the sexual minority group, SCSS ($B = -0.52, p < 0.01$) and HHRDS ($B = 0.55, p < 0.01$) were associated with food addiction symptoms, such that those experiencing less self-compassion (SCSS) and more external discrimination (HHRDS) were reporting more symptoms of food addiction than those experiencing more self-compassion and less discrimination. Associations between both SCSS and HHRDS and symptom count held when BMI was included as a covariate (Table 2).

Further analyses indicated that SCSS was marginally associated

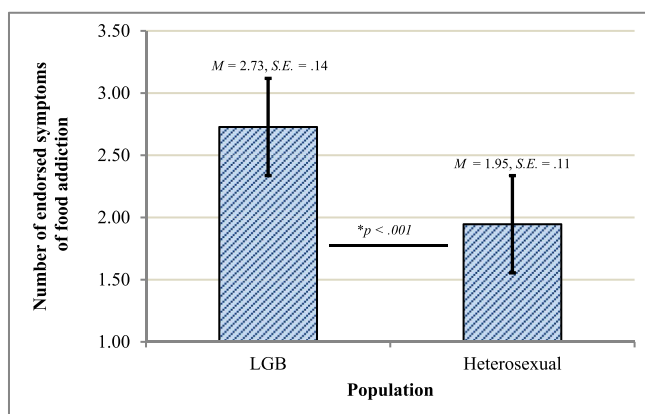


Fig. 1. This figure illustrates the mean number of endorsed symptoms of food addiction for LGB and heterosexual populations as measured by the Yale Food Addiction Scale (Welch's statistic (1, 310.12) = 18.69, $p < 0.001$).

Table 2

Unstandardized coefficients of SCSS and HHRDS predicting food addiction symptoms and food addiction diagnosis when controlling for BMI (Aim 2).

	Food addiction symptoms			Food addiction diagnosis		
	B	S.E.	p	B	S.E.	p
BMI	0.05	0.02	<0.01	0.05	0.03	0.07
SCSS	-0.46	0.19	0.01	-0.54	0.31	0.08
HHRDS	0.61	0.17	<0.01	0.48	0.26	0.07

with food addiction diagnosis ($B = -0.62, p = 0.052$) and that HHRDS was not associated with food addiction diagnosis ($B = 0.40, p = 0.11$). When controlling for BMI, the association between SCSS and food addiction diagnosis remained marginally significant and the association between HHRDS and food addiction became marginally significant (Table 2).

4. Discussion

In the current study, individuals who identified as sexual minorities (i.e., lesbian, gay, or bisexual), as compared to heterosexual, reported higher levels of food addiction symptoms and were more likely to meet the threshold for food addiction. This pattern is similar to substance use disorders, which occur at higher rates in sexual minority samples (Institute of Medicine, 2011, pp. 159–161). One possible contributor to the elevated level of addictive disorders in sexual minority samples is the increased stress associated with experiences of discrimination. Consistent with this possibility, sexual minorities in the current study who reported experiencing more heterosexist harassment, rejection, and discrimination had higher levels of addictive-like eating. In contrast, self-compassion was negatively associated with addictive-like eating in the current study.

These findings build on the limited existing literature on food addiction in sexual minorities. Only one prior study has examined that association of food addiction with sexual orientation. Similar to the existing study, sexual minorities reported higher numbers of food addiction symptoms ($M = 1.83, SD = 8.59$) relative to heterosexuals ($M = 1.27, SD = 1.79$) (Bankoff et al., 2016). However, this prior study was conducted in a sample of veterans only, in which only a small subset identified as sexual minorities (4%) and all sexual minorities were male ($n = 24$). The current study adds to the existent research by investigating the association of addictive-like eating and sexual minorities through the use of a community sample with a larger number of sexual minority individuals ($n = 154$) and through the inclusion of both males and females in the sample. Although we were not sufficiently powered to directly compare male and female sexual minorities, the representation of both genders is especially important in studies on food addiction as women are at an increased risk for eating-related problems (Striegel-Moore et al., 2009). In comparison to prior research on food addiction in sexual minorities (Bankoff et al., 2016), sexual minorities in the current sample reported higher food addiction symptoms ($M = 2.73, SD = 1.76$). Future research is needed to evaluate what factors (e.g., veteran status, gender) may be related to higher level of addictive-like eating in different sexual minority populations.

This larger sample of sexual minorities allowed for further examination of what factors might be associated with food addiction for this group. For sexual minorities, greater experiences of heterosexist harassment, rejection, and discrimination were associated with increased food addiction. Relative to other samples that examined heterosexist harassment, rejection, and discrimination

through the use of the HHRDS, the sexual minorities in the current sample reported approximately the same levels of discrimination (Friedman & Leaper, 2010; Lehavot & Simoni, 2011; Szymanski & Ikizler, 2013; Szymanski, 2009), which suggest the current results are generalizable. In sexual minorities, higher rates of substance use disorders may be related to motivations to reduce negative emotions that are linked to greater exposure to discrimination (Brooks et al., 2012; Hatzenbuehler, 2009). Experiences of heterosexual discrimination appear to be similarly associated with increased addictive-like eating. Discrimination-related stress may increase the motivation to eat palatable foods to cope with negative emotions, which has been related to increased food addiction symptoms (Joyner, Schulte, Wilt, & Gearhardt, 2015; Boggiano et al., 2015). Further, both food addiction (Eichen, Lent, Goldbacher, & Foster, 2013; Flint et al., 2014; Gearhardt et al., 2012) and discrimination-related stress (Almeida et al., 2009; Belle & Doucet, 2003; Taylor & Turner, 2002) are associated with elevated levels of depression, which may also contribute to the elevated levels of food addiction symptoms in sexual minorities. Prior research on tobacco and alcohol use suggests that structural stigma (i.e., a lack of government policies to protect sexual minorities and negative state-aggregated attitudes towards sexual minorities) interacts with psychological predispositions to predict greater tobacco and alcohol use in minority men (Pachankis, Hatzenbuehler, & Starks, 2014). It will be important in future research to investigate whether in addition to personal experiences of heterosexual discrimination, structural stigma can also contribute to addictive-like eating in sexual minority individuals. Additionally, examining the association of other types of discrimination (e.g., sexism, racism) with food addiction will be an important future direction.

Conversely, greater self-compassion was associated with less food addiction symptoms for sexual minorities. Self-compassion may protect against the development of addictive behaviors by reducing distress from stressful experiences by increasing self-kindness and mindfulness while decreasing self-judgement and overidentification with negative characteristics (Brooks et al., 2012; Vettese, Dyer, Li, & Wekerle, 2011). For example, having a tendency toward self-compassion is thought to promote positive mental health outcomes, such as a reduction in drinking behaviors (Brooks et al., 2012; Neff, 2003a). It has also been noted that self-compassion interventions are also more effective at smoking cessation than other self-monitoring interventions (Kelly, Zuroff, Foa, & Gilbert, 2010). The manner in which it is believed that self-compassion helps individuals to cope with substance use problems is by providing an alternative coping strategy and reducing negative self-appraisals (Miron et al., 2014). Similarly, self-compassion appears to be associated with less addictive-like eating and may be an important intervention target for reducing eating-related problems for sexual minorities. For example, mindfulness-based interventions that include a focus on self-compassion can reduce the intake of a number of drugs of abuse (e.g., alcohol, cocaine, marijuana) and reduce craving (Chiesa & Serretti, 2014). Thus, future interventions that aim to reduce addictive-like eating for sexual minority individuals may benefit from mindfulness-based approaches that emphasize self-compassion.

There are several limitations to this study. The study was cross-sectional, so the time course of associations cannot be inferred. Longitudinal studies are needed to further understand how the associations between discrimination, self-compassion, and food addiction unfold. Although the sample size of sexual minorities was larger than prior investigations of food addiction, power considerations resulted in the need to combine the various sexual minority groups into one sexual minority group. Each group of sexual minorities might face unique challenges faced by that particular

identity within sexual minorities. For example, although heterosexuals are likely to view both gay men and lesbians as violating gender norms, heterosexual men are more likely to see gay men's actions as more deviant than the actions of lesbians since men are more likely to adhere to gender norms than females (Kite & Whitley, 1996). However, this does not mean that lesbians do not experience discrimination in the workplace; on the contrary, the probability of a lesbian being invited to a job interview after revealing her sexual orientation significantly decreases (Weichselbaumer, 2003). Bisexuals have also been reported to face different stressors than that of their gay and lesbian counterparts (Bostwick, 2012). As a result, there might be differences between sexual minorities that we could not observe in this study. A further limitation to the current study is that gender influences were unable to be investigated to the fullest extent, due to not recruiting a large enough sample of individuals identifying as transgender. As a result, future research should focus on recruiting larger sample of individuals identifying as transgender to investigate addictive-like eating in this group. Another limitation is that this survey was electronic, so height and weight might have been misreported by individuals. Future research would benefit from direct measurement of these variables. Additionally, eating disorders were not assessed in the current study. Food addiction and eating disorders are distinct, but related constructs (Schulte, Grilo, & Gearhardt, 2016). The co-occurrence of eating disorders and food addiction is associated with more severe pathological eating (Gearhardt et al., 2012; Wolz et al., 2016). It will be important in future research to investigate how sexual minority status may be associated with eating disorders, as well as addictive-like eating. Finally, the current study was recruited from the community and only 13.2% of participants met the food addiction threshold, which may have limited power to detect associations with the diagnostic scoring option of the YFAS. Future research in clinical samples will be important to evaluate the association of sexual minority status with more severe addictive-like eating.

5. Conclusions

This study has potentially important implications. This research highlights the importance of screening for food addiction more frequently for sexual minorities. Food addiction is associated with obesity, diet-related disease (e.g., hypercholesterolemia), and depression (Davis et al., 2013; Meule & Gearhardt, 2014; Meule & Kübler, 2012; Meule et al., 2017), which suggests that sexual minorities may be at increased risk for these negative outcomes. Prevention and interventions efforts designed to reduce addictive-like eating in sexual minority samples would likely benefit from addressing the psychological distress of experiencing discrimination. Strategies designed to increase self-compassion may be effective in reducing vulnerability to addictive-like eating for sexual minorities, although future research is needed.

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