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WASHINGTON UNIVERSITY IN ST. LOUIS

Department of Psychological and Brain Sciences

Comparisons of Eating Disorder Presentation, Research Participation, and Treatment Utilization
Between Racial and Ethnic Groups of College Women with Eating Disorders

by

Grace Monterubio

A Thesis presented to
The Graduate School
of Washington University in
partial fulfillment of the
requirements for the degree
of Master of Arts

December, 2018
St. Louis, Missouri

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Acknowledgments

The author would like to thank all participating universities, research participants, and study staff for their time and dedication to these studies, without whom this work would not be possible.

This research was supported by funding from the National Institutes of Health, R01 MH100455, and National Institutes of Health Diversity Supplement, PA-15-322. The author would like to thank the support from her mentor, Dr. Denise Wilfley, and the research team in Dr. Wilfley's laboratory at Washington University in St. Louis.

Grace E. Monterubio

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December 2018

ABSTRACT

Comparisons of Eating Disorder Presentation, Research Participation, and Treatment Utilization

Between Racial and Ethnic Groups of College Women with Eating Disorders

by

Grace Monterubio

Master of Arts in Psychological and Brain Sciences

Washington University in St. Louis, 2018

Denise E. Wilfley, Chair

The inclusion of racial and ethnic minority individuals in research is imperative in furthering generalizable and comprehensive research on eating disorder (ED) populations and improving the disparities for minorities with EDs. The current study investigates such disparities by 1) assessing the presentation of EDs and comorbidities across racial and ethnic groups, as well as 2) assessing whether minority individuals are less likely to participate in a research study, or utilize the offered interventions versus their majority counterparts in the Healthy Body Image Program (HBI), a study of an online, guided self-help, ED intervention vs. referral to in-person care among college women with clinical or sub-clinical EDs. Study 1 compared ED symptomology, ED-related clinical impairment, and comorbid psychopathologies across racial and ethnic groups within the HBI sample. Study 1 also compared rates of engagement in research, engagement in the online program, and engagement with referral to in-person care between minority and non-minority participants. Results found mostly comparable rates of ED symptomology, ED-related clinical impairment, and comorbid psychopathologies across racial and ethnic groups, with notable differences observed in Asian women endorsing more binge eating than White women, and the Other racial group endorsing more laxative use than the White

and Asian racial groups. Additionally, Hispanics reported more laxative use and higher levels of insomnia than non-Hispanics. Study 1 also found comparable rates of engagement in research, online program, and referral to in-person care between minority and non-minority groups. Study 2 followed-up with the minority participants who were unengaged in research, the online program, and referral to in-person care, and investigated their barriers to participation. Results from the Study 2 provided useful information on specific obstacles to address in future efforts to decrease disparities in treatment utilization by minorities with EDs.

Introduction

The inclusion of individuals who identify as of a racial or ethnic minority in mental health research, and the improvement of treatment utilization by minorities, is imperative to reducing the disparities found between minority and non-minority individuals with mental health conditions. Indeed, the disparities experienced by minority individuals with mental health disorders are numerous, with discrepancies not only in access to care (Becker, Franko, Speck & Herzog, 2003) but also disparities at the provider level, with unequal rates of diagnosis and referral to treatment (Marques, et al, 2011). A particular group of mental health conditions that is impacted by disparities in health care utilization for minority individuals is eating disorder (ED) diagnoses. Until relatively recently, EDs were thought to be a problem fairly exclusive to White, non-Hispanic, young women; however, current research findings have revealed that EDs do not discriminate, and can impact anyone regardless of race, ethnicity, gender, age, or socio-economic status (Schaumberg, et al. 2017). As such, the inclusion of racial and ethnic minority individuals in research is imperative in furthering generalizable and comprehensive research on ED populations, and thus, improving the disparities for minorities with EDs.

The current study investigates such disparities by 1) assessing the presentation of EDs and comorbid psychopathologies across racial and ethnic groups, as well as 2) assessing whether minority individuals are less likely to participate in the long-term research study, or utilize the offered interventions versus their majority counterparts in the Healthy Body Image Program (HBI), a study of an online, guided self-help, ED intervention vs. referral to in-person care among college women with clinical or sub-clinical EDs. The HBI study occurred over the course of three years. Students were recruited from campuses across the United States (U.S.) using the Stanford-Washington University Eating Disorder Screen (SWED; Kass et al., 2018). Women

who screened positive for a clinical/sub-clinical ED other than anorexia nervosa (AN) were eligible for the randomized controlled trial portion of HBI, comparing a guided self-help, cognitive-behavioral therapy-based (CBT-based) mobile program for EDs vs. referral to usual care. Individuals who indicated interest in participating in the long-term trial completed a baseline survey measuring ED psychopathology and other variables of interest, including ED-related clinical impairment and co-occurring psychopathology. This study provided a large sample of women with EDs (except AN) that represented multiple racial and ethnic groups, from demographically diverse colleges and universities across the U.S. Given that this sample represented many diverse women with clinical and sub-clinical EDs, the HBI sample will be used to investigate the aims of this current study.

Studying ED symptoms reported by individuals from minority backgrounds compared to other racial and ethnic groups is important to understanding any differences that may present across groups. Few studies have compared presentation and severity of ED symptoms or comorbid psychopathology, in a large, college-aged sample comprised of multiple racial and ethnic groups. The few studies that exist mainly focus on adult community samples. One study found a comparable prevalence of ED symptoms across Hispanic, Asian, African American, and White women in a community sample (Cachelin, Veisel, Barzegarnazari, & Striegel-Moore, 2000). Marques and colleagues (2011) also found similar rates of binge eating disorder (BED) and AN diagnoses in Latino, Asian, and African American groups relative to non-Latino Whites in a representative sample of U.S. adults, and an elevated prevalence of bulimia nervosa (BN) in minority groups compared to non-Latino Whites. Limited studies have focused on the presentation of ED symptoms and comorbidities among college students from racial/ethnic minority backgrounds, despite the very high prevalence of EDs in college populations (Eisenberg

et al, 2013). To the author's knowledge, only one study has examined the *frequency* of ED behaviors and *related distress* in a large, demographically representative sample of college women (Franko, Becker, Thomas, & Herzog, 2008). Franko et al. (2008) found comparable frequencies of all ED behaviors other than laxative/diuretic use being higher in Native Americans than the other racial/ethnic groups, which is similar to results of adult women in the community (Cachelin et al., 2000). Other studies of college samples that have attempted to examine ED behaviors across individuals from different racial/ethnic minority groups have been lacking in terms of the diversity of their samples or in terms of the range of ED behaviors studied. For example, studies have investigated differences between Whites and one racial/ethnic group specifically, or have focused on risk and body dissatisfaction rather than ED symptom presentation (Grabe & Hyde, 2006; Reyes-Rodriguez et al., 2010). Thus, more research is needed to expand the knowledge about ED symptoms in college women across multiple racial and ethnic groups. One of the aims of the current study is to analyze a large, multi-site, sample of college women who screened positive for an ED (with the exception of AN) and to compare the severity of ED symptomology, ED-related clinical impairment, and comorbid psychopathology across racial and ethnic groups.

The first line strategy for reducing disparities in ED treatment for minority individuals is emphasizing the inclusion of underrepresented groups in research and addressing the low participation of minority individuals in research compared to non-minority individuals. Previous research has found that minority individuals are less likely to participate in clinical research due to historical research malpractice, as well as current experiences with research and clinical interventions. Corbie-Smith et. al (2002) found that African American individuals had a higher distrust of medical researchers compared to White individuals, independent of social class, due

to previous malpractices, such as the Tuskegee experiments. Additionally, Thompson, et al. (2011) found minority individuals who had had previous involvement with mental health treatment (whether personally or through a close relative/friend) were less likely to participate in mental health clinical research due to those previous experiences being uncomfortable or unhelpful. As such, engaging minority individuals in clinical research can be very difficult, further contributing to the research disparities that aim to understand and improve clinical treatment for these underrepresented groups. Extra effort is needed to include these groups in research so that we can improve our understanding of ED symptom presentation across groups as well as better engage this population in treatment. Thus, it is imperative to study contributions to the disparities to ensure that future research is inclusive of minorities so that findings can be generalized to all groups in need and identify solutions to these disparities.

Further disparities are seen in treatment utilization by minority individuals as well as at the healthcare provider level. Research findings indicate that not only is access to care limited, but also the uptake of mental health services, including ED treatment, is lower amongst minority groups. Alegria et al. (2002) found that Latino, African American, and non-Latino Whites with EDs have inequalities in use of health care interventions, with minority groups utilizing services less. For specific treatment services, Alegria (2008) further found that minority individuals are less likely to seek clinical treatment for depression as well. This is consistent with Thompson et al.'s (2004) study that revealed African Americans with close family or relatives who reportedly had poor experiences in the mental health care system were less likely to utilize mental health services themselves. Research on treatment utilization for EDs showed similar findings, with health care providers diagnosing EDs in minority individuals less, as well as lower treatment utilization among minority individuals. Indeed, Becker et al. (2003) found that racial and ethnic

minority groups were less likely to receive a referral to care for their ED symptoms by their health care provider, even when controlling for severity of ED symptoms. Similarly, Marques, et al. (2011) found minority groups were less likely to utilize services for their ED diagnoses. Overall, findings indicate that general usage of mental health treatment is lower amongst minorities for not only psychiatric disorders in general but also EDs specifically, and thus reveal the importance of work aiming at lessening the disparity of mental health treatment for minorities with EDs.

The aim of the is paper is to investigate multiple components that contribute to the disparities affecting minority individuals with EDs in two studies. First, Study 1 will compare symptom severity, comorbid psychopathologies, and clinical impairment, in a large, racially and ethnically representative sample of college women with clinical/sub-clinical EDs other than AN. Next, this study will assess whether minority participation in our research study and offered interventions was different from non-minority participation. Specifically, Study 1 will investigate if minority students were less likely to enroll in the HBI research study, and if enrolled, less likely to use the offered interventions of an online program or in-person referral. Based on previous research, it is anticipated that minority students will be less likely to engage in the HBI research study, and less likely to have utilized the offered interventions if enrolled.

The goal of Study 2 is to follow-up with minority individuals who did not participate in the HBI program (those that did not enroll in the long-term research study, or did not use the interventions offered by the study) via an online survey in order to assess perceived barriers to research and intervention utilization. The objective of this survey is to collect more specific information on the types of barriers faced by minority students who did not engage in the research or offered interventions. Study 2's findings will be presented in an exploratory manner

and may aid in improving future iterations of the HBI Program to maximize inclusiveness of racial and ethnic minorities in ED interventions.

Methods

Participants and Procedures for the HBI Study

Students on participating U.S. college campuses ($N = 28$) ages 18 years or older were eligible to complete an initial online screen as part of the HBI Program study. This study received Institutional Review Board approval and acknowledgment from all cooperating universities, and all participants provided informed consent.

Students were recruited over three years using campus-specific recruitment strategies, developed collaboratively with campus liaisons (e.g., identified HBI partners in the counseling/health center—typically a counselor), including use of email, social media, printed flyers and pamphlets, in-person presentations, and peer health educators/counselors in the counseling/health center offering HBI to individuals in need. Students interested in participating completed the SWED screen. Those who screen result indicated a clinical/sub-clinical ED other than AN were offered a baseline survey to complete if they wanted to participate in the long-term randomized controlled trial portion of HBI, which compared a guided self-help, CBT-based mobile program for EDs to referral to in-person care at the student health services/counseling center on their campus. Those whose screened positive for possible AN were given a referral to in-person treatment at the campus health center; the online nature of the HBI program was deemed inadequate for monitoring AN symptoms given the medical comorbidities associated

with this disorder. A total of $N = 914$ women completed the screen and were eligible to participate in the HBI research study (Diagram 1). Of those eligible, $n = 690$ women enrolled in the long-term trial by completing the baseline survey measuring ED psychopathology, ED-related clinical impairment, and other variables of interest, including commonly co-occurring psychopathologies of depression, anxiety, and insomnia.

Study 1

Methods

Participants and Procedures

Participants in Study 1 were 690 college women who screened positive for an ED (excluding AN) via the HBI online screen and completed the baseline survey. The mean Body Mass Index (BMI) for the sample was 25.47. The participants self-identified their race, and the sample consisted of 62% White/Caucasian, 17% Asian or South Asian, 8% more than one race, 7% other, 6% Black/African American, with less than .01% Native American/Alaskan Native or Native Hawaiian/Pacific Islander. Regarding ethnicity, 83% identified as non-Hispanic and 17% as Hispanic. To compare constructs across racial groups, participants from the Native American/Alaskan Native and Native Hawaiian/Pacific Islander groups were combined with the “other” racial group due to insufficient sample size for comparisons of those groups.

Next, engagement in research and treatment utilization between minority and non-minority students was analyzed. Research engagement was assessed through participation in the offered baseline after a positive ED screen. Those who chose not to enroll in the long-term research trial but screened positive for an ED were considered “unengaged in the research.”

Those who chose to participate, and were randomized into the program (intervention) condition, but completed less than 4 sessions of the online intervention were considered “unengaged in the program.” Participants who were randomized into the referral (control) condition, but reported on the 6-month follow-up questionnaire that they “did not receive in-person treatment within the last 6-months” were considered “unengaged with referral”. These groups were defined as: Unengaged in Research (screened but did not complete baseline), Unengaged in Program (completed less than 4 program sessions), and Unengaged in Referral (did not utilize the referral to in-person care by 6-month follow-up)(Diagram 1).

For the analyses of engaged vs. unengaged participants, some of the racial groups within the unengaged categories were too small for across group comparisons, and so distinct racial and ethnic groups were combined to compare minorities (participants who identified as of any racial group except White, and/or Hispanic [n = 416]) vs. non-minorities (participants who identified as White and non-Hispanic [n = 498]). Additionally, comparisons of engagement in the online program could only be made for students who participated in years two or three of the HBI study. The version of the online program in year one was a web-based intervention only, and utilized longer, weekly sessions. In years two and three, the program was modified to offer the intervention via iPhone mobile app (with web browser access available as well), and the program sessions were offered in smaller, daily “doses” of the online intervention. Given this distinction, the amount of session content the unengaged participants viewed varied greatly between those in year one and those in year two and three. Thus, the current paper focused on the participants offered the program during years two and three, and year one participants from the program condition were excluded from the analysis of program engagement.

Measures

Participants completed the following measures.

Eating Disorder Symptomology. The Eating Disorder Examination-Questionnaire (EDE-Q, version 6.0; Fairburn, 2008) is a 28-item questionnaire that assesses ED psychopathology, including weight concern, shape concern, eating concern, and restraint subscales, as well as a global score, over the last 28 days. The EDE-Q also measures self-reported frequency of ED behaviors (i.e., binge eating, vomiting, laxative use, compulsive exercise). A review of psychometric evaluations of the EDE-Q established it has good test-retest reliability and strong internal consistency, as well as construct validity and criterion-oriented validity (Berg, Peterson, Frazier, Crow, 2012). Cronbach's alpha for this sample was .91.

Clinical Impairment. The Clinical Impairment Assessment (CIA; Bohn & Fairburn, 2008) is a 16-item measure that assesses impairment due to ED symptoms over the past 28 days. Items are rated on a 4-point Likert scale with responses ranging from 0 ("not at all") to 3 ("a lot"). The cut-off point that best determines ED clinical case status is a global score of 16 (Bohn & Fairburn, 2008). The CIA has also established good test-retest reliability, strong internal consistency, and construct validity (Reas, Øyvind, Kapstad, Kask, 2010) Cronbach's alpha for this sample was .94.

Sleep Disturbance. The Insomnia Severity Index (ISI; Bastien, Vallieres, & Morin, 2001), is a 7-item questionnaire that assesses sleep disturbance and insomnia over the last two weeks using a scale from "none" to "very severe." Higher scores indicate higher levels of insomnia, with a clinical cut-off of 11 indicative of clinical insomnia (Shahid, Wilkinson, Marcu, Shapiro, 2011). Additionally, the ISI is supported by discriminant and convergent

validity, as well as strong internal consistency (Morin, Belleville, Bélanger, Ivers, 2011). Cronbach's alpha for this sample was .89.

Depression. The Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002) assesses depressive symptoms and low mood over the last two weeks on a 4-point scale (“not at all” to “nearly every day”). Higher scores correspond to greater severity of depressive symptoms, with a clinical cut-off of 10 indicative of moderate depression (Kroenke, Spitzer, & Williams 2001). The PHQ-9 has also demonstrated strong internal consistency and test-retest reliability, as well as a good criterion and construct validity (Kroenke, Spitzer, & Williams, 2001). Cronbach's alpha for this sample was .88.

Anxiety. The Patient-Reported Outcomes Measurement Information System Short Form v1.0 – Anxiety4a (PROMIS; Pilkonis et al., 2011) is a 4-item measure that assesses anxiety and worry over the last seven days on a 5-point scale (“not at all” to “very much”). Higher scores correspond to greater severity of anxiety symptoms. The PROMIS has demonstrated precision, convergent validity, and content validity, as well as good internal consistency (Pilkonis, et al., 2011). Cronbach's alpha for this sample was .90.

Analytic Strategy

Severity of ED symptoms, ED-related clinical impairment, and comorbid psychopathology were compared across racial groups using analyses of variance (ANOVAs). When ANOVA results were significant ($p < .05$), Tukey's post-hoc tests were conducted to determine the nature of significant findings. Study constructs were compared between ethnic groups (i.e., non-Hispanic and Hispanic) using independent-samples *t*-tests.

Proportions of minority and non-minority participants unengaged in the research study, online program, or referral to in-person treatment were compared through Pearson's Chi-Square Tests.

Results

Comparison of Racial Groups

Eating Disorder Severity. As shown in Table 1, there were no significant differences across racial groups on ED psychopathology indices (i.e., EDE-Q Global and subscales) ($ps \geq .13$). Regarding ED behaviors, racial groups did not differ on vomiting or compulsive exercise ($ps \geq .22$) but did significantly differ on frequencies of binge eating ($p = .001$) and laxative use ($p = .007$). Post-hoc Tukey tests revealed that Asian/South Asian women reported significantly more binge eating episodes than White/Caucasian women ($p = .001$), and women who identified their race as "Other" reported significantly more laxative use than Asian/South Asian ($p = .005$) and White/Caucasian ($p = .006$) women.

Clinical Impairment Severity. As shown in Table 1, there was no significant difference across racial groups in ED-related clinical impairment ($p = .37$).

Comorbidity Severity. As shown in Table 1, there were no significant differences across racial groups on depression, anxiety, or insomnia ($ps \geq .29$).

Comparison of Ethnic Groups

Eating Disorder Severity. As shown in Table 2, there were no significant differences between ethnic groups on ED psychopathology indices (i.e., EDE-Q Global and subscales) ($ps \geq$

.38). Regarding ED behaviors, ethnic groups did not differ on binge eating, vomiting, or compulsive exercise ($ps \geq .46$) but did significantly differ in the frequency of laxative use in the last 28 days ($p = .002$), with Hispanic women reporting more laxative use than non-Hispanic women.

Clinical Impairment Severity. As shown in Table 2, there was no significant difference between ethnic groups in ED-related clinical impairment ($p = .64$).

Comorbidity Severity. As shown in Table 2, there were no significant differences between ethnic groups on depression, or anxiety ($ps \geq .24$). However, a significant difference emerged for insomnia with Hispanic women endorsing higher levels of insomnia symptoms ($p = .03$) relative to their non-Hispanic counterparts.

Engagement in Research

Comparison of participation between minority and non-minority students. As shown in Table 3, there was no significant difference in research participation (students who chose to complete baseline after a positive screen) between the minority and non-minority participants ($p = .097$). Within the minority group, 21.87% did not complete a baseline to enroll in the long-term study, and 26.91% of the non-minority group did not complete a baseline to enroll in the long-term study.

Engagement in Offered Intervention (Online Program or Referral to In-Person Treatment)

Comparison of engagement between minority and non-minority students.

Online Program. As shown in Table 3, there was no significant difference in engagement in the online ED program (completing < 4 program sessions) between the minority

and non-minority participants ($p = .796$). Within the minority group, 38.05% were unengaged in the offered online intervention, and 36.36% of the non-minority group were unengaged in the program.

Referral to In-Person Treatment. As shown in Table 3, there was no significant difference in utilization of the referral to in-person treatment at six months between the minority and non-minority participants ($p = .183$). Within the minority group, 85.71% did not receive treatment six months after offered a referral to in-person treatment, and 78.57% of the non-minority group did not receive in-person treatment six months after offered a referral.

Study 2

Methods

Participants and Procedures

Minority students in the primary study who were Unengaged in Research (screened but did not complete baseline), Unengaged in the Program (completed less than 4 program sessions), and Unengaged in Referral (did not utilize the referral to in-person care by 6-month follow-up) ($n = 164$)(Diagram 1), were invited to participate in a follow-up survey aiming to investigate the barriers to engagement. As mentioned in Study 1, engagement in the online program was not assessed for students who participated in the first year of the study. Thus, only students who were unengaged in the online program from years two and three of the study were invited to participate in the follow-up study.

Students were invited to participate in the follow-up study via email and were also called at the phone numbers they provided as contact information on the HBI screen. Email invitations to the study were sent up to four times, along with two phone calls to inquire if the students' had any questions about the study invitation they received over email. Overall, (56.7%) of the participants invited to complete the follow-up survey responded. Participation rates varied between the unengaged groups (Unengaged in Research n = 19 out of 51 invited [37.3%], Unengaged in Program n = 11 out of 33 invited [33.3%], Unengaged in Referral n = 63 out of 80 invited [78.8]).

Measures

The structure of the surveys and question sets were primarily the same for all participants; however, questions specific to those in the unengaged in research, online program, or in-person referral groups were tailored to match the experience of the student. For example, students unengaged in research were asked if there were barriers that prevented them “from participating in the Healthy Body Image study,” those that were unengaged in the online program were asked about their barriers to “using the online platform,” and students that were unengaged with the in-person referral were asked about their barriers to “utilizing the provided referral.”

Additionally, if participants endorsed that they “Agreed” or “Strongly Agreed” with a barrier, the survey asked them to “identify and describe any additional obstacles” that may have increased the barrier they endorsed, and allowed them to free-write respond and describe more about their answer. These prompts were not provided if the student did not endorse a barrier, or marked that they “Disagreed” or “Strongly Disagreed” with a barrier. Thus, all qualitative replies

are in response to agreeing or strongly agreeing with a barrier to their participation. These prompts provided informative qualitative responses about the individual students' experiences and allowed the students to describe more about their endorsed barrier in relation to their life as a minority student with an ED.

Participants completed the following measures.

Barriers to Treatment. The Barriers to Treatment questionnaire was tailored for each unengaged group condition and were modified from Cachelin and Striegel-Moore (2006) to assess specific barriers to engagement in the HBI study or offered interventions. The questionnaire ranged from 15-22 questions (depending on whether the participants were unengaged in research, the program, or referral to in-person care), and assessed how much a given barrier interfered with engagement on a 5-point scale from “strongly disagree” to “strongly agree.” Cronbach’s alpha could not be calculated for this sample, as the items slightly differed across groups, and could not be combined for statistical analysis.

Analytic Strategy

Given the small sample sizes of the both the Unengaged in Research and Unengaged in Program groups, and distinct questions for each group, comparisons of responses across the three unengaged groups could not be made. Thus, results from each group will be presented individually. Additionally, the qualitative responses (open response text boxes) are informative, and noteworthy inclusions for future research considerations.

Results

Regarding research engagement. The minority students who screened positive for an ED but did not want to participate in the research study (did not complete baseline) were asked about their barriers to engaging in the research study. As detailed in Table 4, the most endorsed reasons for not participating in the research study were that they were too busy for the research program (55% responded “Agree” or “Strongly Agree”) or that they were concerned about privacy (40% responded “Agree” or “Strongly Agree”).

For the students who endorsed these barriers, qualitative responses provided additional detail about the students’ experiences. A student described how “I was too busy and it was too sensitive a topic.” Another student similarly described how the content impacted her decision to participate, stating “I was simply being avoidant to dealing with my issues and to being reminded of it.” For some students, their cultural background also compounded the sensitivity of the content, with a student describing, “body image issues and disordered eating are exacerbated by racial experience. I’m tired of talking about body image without the understanding that my experiences as a black woman, many of them negative, are largely the cause of my body image issues.” Alternatively, another student was worried about the security of her information in the online study, describing how “my parents are paranoid about our information being stolen. We aren’t originally from the states.” Though these quotes come from individuals within the group of students who chose not to participate in the research study, these qualitative responses shed light on the many endorsed barriers that prevented participants from enrolling in the long-term study, and add insight to the thoughts and beliefs held by minority individuals with EDs who chose not to participate in the HBI study.

Regarding program engagement. The minority students who participated in the research study but did not engage in the online intervention (utilized less than 4 sessions of the

online program) were asked about their barriers to engaging in the online program. As detailed in Table 5, the most endorsed reasons for not using the intervention was that students were too busy for the research program (72.7% responded “Agree” or “Strongly Agree”), that they did not want to share their personal information with the online coach (45.5% responded “Agree” or “Strongly Agree”), or that they felt the online coach would not understand their cultural, and/or racial/ethnic influences (45.5% responded “Agree” or “Strongly Agree”).

For the students who endorsed these barriers, qualitative responses provided additional detail about the students’ experiences. Many students endorsed time as a concern for not using the program, and one participant noted, “I was an undergraduate and it was a struggle trying to take classes.” A student who felt uncomfortable discussing her concerns with the online coach responded that “it was strange to reveal all these things to someone I did not know, especially a single person. [It] made me feel like they would be judging me or thinking what I said was stupid.” Similarly, another did not think that the coach would understand her background, and reported that she “would have to explain a lot to get this coach to understand my family/cultural background and how my family's relationship with food/body image largely shaped my understanding of body image and health in a way that I don't believe is mainstream or common.” Another had similar concerns regarding her religious background, and said she “didn't know how my faith would be considered—fasting is part of my faith but I also struggle with fasting for diet purposes.” Socioeconomic concerns were also reported in regards to describing behaviors to a coach, one student stated, “it is always harder to relate to people who are not in your socioeconomic group (cannot afford to eat healthy vs. can afford to buy premade salads).”

Though these quotes come from individuals within the group of unengaged participants, these qualitative responses are powerful insights on the endorsed barriers that prevented participants

from utilizing the HBI program and highlight the need to implement these diverse perspectives into future improvements for the next generation of online ED programs.

Regarding referral engagement. The minority students who participated in the research study but did not utilize the referral to in-person care (did not receive in-person treatment for an eating-related problem by 6-months following offered referral) were asked about their barriers to receiving in-person treatment. As detailed in Table 6, the most endorsed reason for not receiving treatment was the belief that their problem was not serious enough to warrant treatment (77.6% responded “Agree” or “Strongly Agree”), followed by believing one should be able to help themselves (65.3% responded “Agree” or “Strongly Agree”), not having enough time to seek treatment (51.0% responded “Agree” or “Strongly Agree”), turning to other sources of support such as family and friends (46.9% responded “Agree” or “Strongly Agree”), treatment being too expensive (40.8% responded “Agree” or “Strongly Agree”), and having lack of trust in providers (40.8% responded “Agree” or “Strongly Agree”).

For the students who endorsed these barriers, qualitative responses provided additional detail about the students’ experiences. Multiple participants endorsed the compounding barrier of stigma to mental health treatment for people of their cultural background, noting “brown people don’t do mental health, it’s taboo.” Another reported that “mental health is not discussed in brown communities.” Others expressed their parents’ reactions and beliefs on utilizing psychological services, one student noting that “my parents view eating as a choice rather than something that could be psychological.” Another participant described a previous experience, when “my dad found out I was seeking counseling, [he] was embarrassed. Made it all about him instead of me.” This barrier was endorsed again by another student “in my dad’s culture, it is frowned upon to take medicine, or go see a counselor or psychiatrist.” Others reported on their

hesitance to seek treatment due to concerns that their provider wouldn't understand their background, with one student stating "being a Black woman makes it difficult to find someone who can relate to me without their implicit biases getting in the way." The barrier of stigma was also endorsed in regards to peers and friends, with one student describing her friends' negative experience, "I've seen a few friends deal with the negative stigmas of having eating disorders and have even myself judged them for their illness." Participants also endorsed difficulties paying for mental health services, one student stated, "I have been turned down at different counseling facilities (outside of campus) when I ask for a discount or a payment plan." Frequently, participants endorsed their personal belief that therapy would not be beneficial to them, one student remarked "I don't think I need treatment, I think I need to just lose weight. And not being able to do that is shameful." Another described, "I don't really have time or money to spend on something unnecessary." Lastly, one student endorsed how she believed she should be able to address her struggles herself, "I don't like feeling like I need others to help me fix lifestyle choices that I know I can fix myself." Though these quotes come from individuals within the group of unengaged participants, these qualitative responses shed light on the many endorsed barriers that prevented participants from utilizing the referral to in-person treatment and add insight to the thoughts and beliefs held by minority individuals who do not receive treatment for their ED symptoms.

Discussion

Results of this study suggest that minority and non-minority college women with EDs generally displayed comparable levels of ED symptomology and comorbid psychopathology, as consistent with past research (Cachelin et al., 2000; Franko et al., 2008). In Study 1, when there were differences, minority women reported *more* severity than White, non-Hispanic women,

with Asian women endorsing more binge eating than White women, and the Other racial group endorsing more laxative use than the White and Asian racial groups. These findings highlight that college women with EDs from certain racial minority backgrounds may actually experience greater ED severity than White women, at least on certain indices. This study adds to the limited literature on ED symptomology across racial and ethnic groups in college samples and may provide additional support for the notion that EDs do not discriminate across racial and ethnic groups, in that ED presentation in minority college women may be just as severe, if not more severe, than presentation among White, non-Hispanic college women (Schaumberg et al., 2017). This indicates a greater need to reach these populations and decrease the disparities of treatment utilization by minority groups.

When considering the severity of ED-related clinical impairment, the means across all racial and ethnic groups were markedly higher than the clinical cut-off. This indicates overarching high levels of impairment due to ED symptoms for all racial and ethnic groups, adding to the findings of Aspen et al. (2014) on clinical severity of EDs across risk groups. Regarding comorbidity averages, all racial and ethnic groups indicated moderate levels of depressive symptoms with all groups averaging above the clinical cut-off score for depression. Thus, this sample suffers from particularly high impairment from their ED symptoms in their day-to-day life, with considerable comorbid depressive symptoms. Also in Study 1, results that investigated rates of engagement in research and the offered interventions were inconsistent with the previous studies indicating the minority individuals were less likely to participate in research than their majority counterparts (Corbie-Smith et al, 2002; Thompson, et al, 2004; Alegria, et al, 2012; Marques, et al, 2011; Cachelin et al., 2000). While the findings that minority and non-minority students have comparable rates of engagement in the referral to in-person care, the

overall low rates of referral utilization are note-worthy. Considering the ED-related clinical impairment reported by this sample, this study exposes a need to improve ED treatment utilization for women of all races and ethnicities. Given that the rates of program utilization were higher than the rates of referral use, online ED interventions, could be a viable treatment for students hesitant to seek in-person treatment.

The exploratory aims of Study 2 used a follow-up assessment to identify potential barriers to enrolling in the HBI study, engaging in the online program, and utilizing referral to in-person treatment. In this follow-up assessment, each of the unengaged groups were asked about the barriers that interfered with their research participation/online program use/in-person referral utilization and were given the opportunity to free respond about the barriers they highly endorsed. In both the unengaged research and online program groups, students most frequently endorsed that they were “too busy” to participate (55% and 72.7%, respectively, endorsed “Agree” or “Strongly Agreed”). Participants that did not utilize the referral to in-person care highly endorsed multiple barriers, including a belief that “their problem was not serious enough to warrant treatment” (77.6% endorsed “Agree” or “Strongly Agreed”), followed by believing “one should be able to help themselves” (65.3% endorsed “Agree” or “Strongly Agreed”), “not having time to seek treatment” (55.1% endorsed “Agree” or “Strongly Agreed”), “turning to other sources of support such as family and friends” (46.9% endorsed “Agree” or “Strongly Agreed”), “treatment being too expensive” and “having lack of trust in providers” (both 40.8% endorsed “Agree” or “Strongly Agreed”). Results from Study 2’s follow-up questionnaire provide useful information on specific obstacles to address in future efforts to decrease disparities in treatment utilization by minorities with EDs. In particular, this information could

be used to better inform the development of online ED interventions so that they appeal to and meet the needs of all women with EDs, including those of racial and ethnic backgrounds.

Strengths and Limitations

Strengths of this study include the use of a large sample of college women with EDs with a strong representation of individuals from a diverse range of racial and ethnic minority backgrounds from a large, geographically diverse array of U.S. universities. Thus, results of this study are relatively generalizable to the large population of female students with clinical and sub-clinical EDs attending U.S. colleges. However, the sample was subject to selection bias; students opted into completing the screen and the possibility of receiving an online program to address their concerns. Additionally, students invited to the follow-up surveys were not random, as only minority participants from the unengaged groups were asked about their barriers to research, program usage, or utilization of in-person referral. Further limitations include the smaller sample sizes of certain racial groups (i.e., Native American/Alaskan Native and Native Hawaiian/Pacific Islander) that precluded separate examination of these groups. Another limitation involves the combining of racial and ethnic groups into a singular “minority” group for engagement comparisons against a White, non-Hispanic, “non-minority” group for some analyses. Similarly, the follow-up survey in Study 2 only included unengaged minority participants. As such, results on the barriers faced by minority students could not be compared to those faced by non-minority participants. The follow-up study also had a low participation rate that disallowed comparison across the three unengaged minority groups. However, lower participation rates were expected given that the survey was specifically asked in a sample that did not participate in the primary HBI study. Furthermore, only women were eligible; thus, results do not generalize to men or individuals of other genders. Additionally, the study enrolled women with clinical or sub-clinical

EDs, excluding AN; as such, these findings are not generalizable to women with AN. Finally, the exclusive use of self-report measures was also a limitation, and our sample includes individuals who screened positive for an ED on an online questionnaire rather than cases identified using a clinical interview.

Clinical Implications

Given that ED severity was mostly comparable across racial and ethnic groups in Study 1, it is particularly important to address the treatment disparities between minority and non-minority women with EDs. Past research indicates minority women are less likely to be provided referrals for ED treatment by clinicians (Becker et al., 2002). Additionally, minority individuals with EDs have been found to be less likely to utilize treatment than non-minority individuals with EDs in both community and college samples (Marques et al., 2011; Cachelin et al., 2000).

There are likely multiple factors that contribute to screening and treatment disparities between minority and non-minority women with EDs. Based on the quantitative and qualitative information about the barriers that interfered with the minority students' engagement in research, online program, or referral to in-person treatment, treatment disparities could be addressed at the provider level, and at the patient level. At the provider level, further work is needed in educating primary care physicians and mental health providers that EDs affect minority women comparably, or even more severely, than non-minority women. Additionally, providers could aim to improve their cultural knowledge of the different experiences that impact their patients' ED experience. At the patient level, further work on dispelling cultural biases regarding EDs, such as that treatment providers will be able to help women of racial/ethnic backgrounds with EDs. Furthermore, developing the online ED interventions to appeal more to racially/ethnically

diverse women with EDs by having more culturally inclusive content, and more diverse online coaches.

Future Directions

Given the multiple and varied barriers to treatment utilization that are faced by the minority individuals', the qualitative free-responses regarding their concerns with treatment could be used to further inform online interventions and treatment resources and improve future investigations aimed at lessening the mental health disparities for minorities with EDs. Future research should explore the additional challenges faced by these communities that may contribute to these disparities, such as socio-economic differences, mental health stigma in other cultures, and lower identification of EDs in minority individuals by providers. Further efforts in these domains could potentially improve the ED detection and enhance treatment options for individuals of racial and ethnic minorities, and thus aid in lessening the disparities experienced these groups.

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Diagram 1.

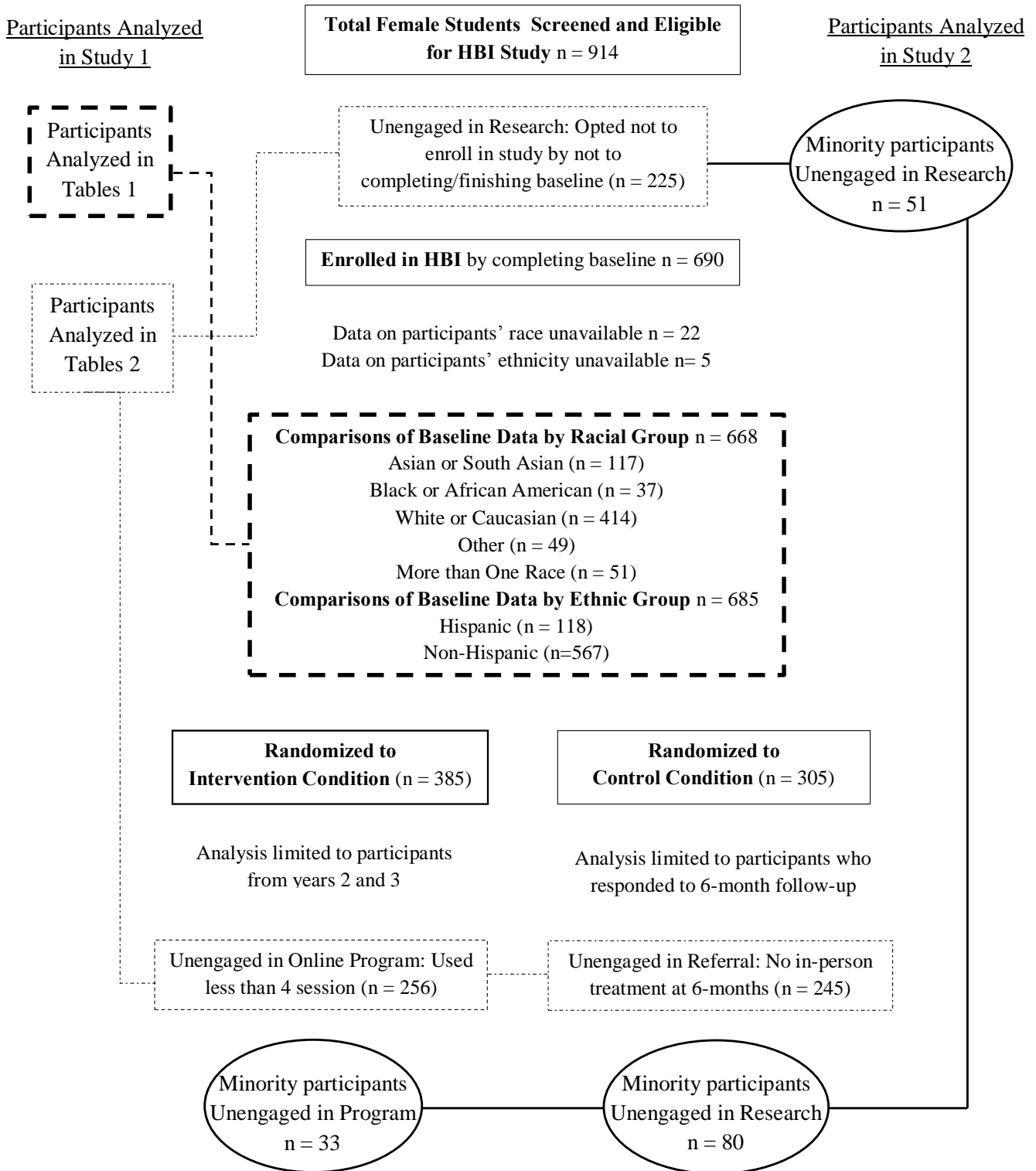


Table 1.

Analyses of Variance on Eating Disorder Symptomatology, ED-Related Clinical Impairment, and Comorbid Psychopathology Across Racial Groups

	Asian or South Asian (<i>n</i> = 117) <i>M</i> (<i>SD</i>)	Black or African American (<i>n</i> = 37) <i>M</i> (<i>SD</i>)	White or Caucasian (<i>n</i> = 414) <i>M</i> (<i>SD</i>)	Other (<i>n</i> =49) <i>M</i> (<i>SD</i>)	More than One Race (<i>n</i> = 51) <i>M</i> (<i>SD</i>)	Results	Pairwise Comparisons
<i>Eating Disorder Symptomatology</i>							
EDE-Q-Global	3.67 (1.11)	3.58 (1.21)	3.61 (1.07)	3.68 (1.24)	3.28 (1.33)	F(4,663) = 1.30; <i>p</i> =.27	--
EDE-Q-Restraint	3.08 (1.44)	2.96 (1.39)	2.98 (1.34)	3.04 (1.31)	2.71 (1.39)	F(4,663) = .67; <i>p</i> =.62	--
EDE-Q-Eating Concern	3.20 (1.37)	2.83 (1.48)	2.97 (1.35)	3.09 (1.63)	2.62 (1.41)	F(4,663) = 1.78; <i>p</i> =.13	--
EDE-Q-Shape Concern	4.43 (1.21)	4.41 (1.30)	4.43 (1.17)	4.46 (1.48)	4.01 (1.35)	F(4,663) = 1.41; <i>p</i> =.23	--
EDE-Q-Weight Concern	3.96 (1.31)	4.11 (1.37)	4.07 (1.19)	4.12 (1.43)	3.77 (1.33)	F(4,663) = .85; <i>p</i> =.49	--
EDE-Q-Binge eating	13.58 (14.24)	9.78 (9.10)	9.39 (8.67)	12.71 (12.13)	10.06 (10.92)	F(4,661) = 4.48; <i>p</i> =.001	Asian > White
EDE-Q-Vomiting	3.34 (8.69)	2.46 (7.59)	2.97 (13.12)	4.18 (9.28)	1.76 (5.92)	F(4,662) = .34; <i>p</i> =.85	--
EDE-Q-Laxative	.76 (2.44)	1.68 (5.26)	1.15 (4.10)	3.80 (12.76)	2.04 (4.75)	F(4,662) = 3.56; <i>p</i> =.007	Other > Asian, White
EDE-Q-Compulsive exercise	5.84 (7.84)	2.51 (4.41)	5.53 (12.75)	4.00 (5.10)	3.00 (5.79)	F(4,662) = 1.43; <i>p</i> =.22	--
<i>ED-Related Clinical Impairment</i>							
CIA	25.31 (12.25)	24.35 (11.50)	25.53 (10.69)	26.04 (12.99)	22.31 (10.73)	F(4,662) = 1.06; <i>p</i> =.37	--
<i>Comorbid Psychopathology</i>							
PHQ-9	11.29 (6.54)	11.65 (7.20)	10.94 (5.88)	12.24 (7.25)	10.92 (5.95)	F(4,662) = .59; <i>p</i> =.67	--
PROMIS Anxiety	11.24 (4.61)	11.14 (3.96)	11.03 (4.04)	12.22 (4.80)	11.55 (4.28)	F(4,663) = .97; <i>p</i> =.42	--
ISI	9.53 (6.35)	10.27 (7.12)	9.11 (6.25)	10.61 (6.39)	10.51 (6.63)	F(4,663) = 1.24; <i>p</i> =.29	--

Note. EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; PHQ-9 = Patient Health Questionnaire-9 for depression; PROMIS-Anxiety = Patient-Reported Outcomes Measurement Information System for Anxiety; ISI = Insomnia Severity Index. Pairwise comparisons listed were significant at least at $p < .05$. ED symptoms are measured in terms of frequency over the 28 days prior to baseline.

Table 2.

Independent Sample t-Test Comparisons of Eating Disorder Symptomology, ED-Related Clinical Impairment, and Comorbid Psychopathology Between Ethnic Groups

	Hispanic (n = 118) <i>M (SD)</i>	Non-Hispanic (n = 567) <i>M (SD)</i>	Results
<i>Eating Disorder Severity</i>			
EDE-Q-Global	3.53 (1.08)	5.60 (1.11)	$t(683) = .65; p = .52$
EDE-Q-Restraint	2.86 (1.25)	2.99 (1.38)	$t(683) = .98; p = .53$
EDE-Q-Eating Concern	2.87 (1.48)	2.99 (1.37)	$t(683) = .88; p = .38$
EDE-Q-Shape Concern	4.37 (1.32)	4.39 (1.22)	$t(683) = .13; p = .90$
EDE-Q-Weight Concern	4.01 (1.30)	4.03 (1.25)	$t(683) = .11; p = .92$
EDE-Q-Binging	10.56 (10.15)	10.33 (10.40)	$t(681) = -.22; p = .83$
EDE-Q-Vomiting	3.08 (7.80)	2.97 (11.98)	$t(682) = -.10; p = .92$
EDE-Q-Laxatives	2.69 (9.17)	1.10 (3.77)	$t(682) = -3.06; p = .002$
EDE-Q-Compulsive Exercise	4.37 (6.37)	5.18 (11.5)	$t(682) = .74; p = .46$
<i>ED-Related Clinical Impairment</i>			
CIA	25.55 (11.72)	25.02 (11.14)	$t(682) = -.47; p = .64$
<i>Comorbid Psychopathology</i>			
PHQ-9	11.54 (6.38)	10.99 (6.13)	$t(681) = -.88; p = .38$
PROMIS Anxiety	11.60 (4.69)	11.09 (4.11)	$t(682) = -1.18; p = .24$
ISI	10.62 (6.29)	9.23 (6.33)	$t(682) = -2.17; p = .03$

Note. EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; PHQ-9 = Patient Health Questionnaire-9 for depression; PROMIS-Anxiety = Patient-Reported Outcomes Measurement Information System for Anxiety; ISI = Insomnia Severity Index. ED symptoms are measured in terms of frequency over the 28 days prior to baseline.

Table 3.

Comparison of participation between minority and non-minority students.

Research Participation (n = 914)	% of Group	Pearson X² (df)	Significance
Did Not Complete Baseline (n = 225)			
Non-Minority (n = 134)	26.91%	3.094 (1)	<i>p</i> = .090
Minority (n = 91)	21.87%		
Intervention/Referral Engagement (n = 690)			
Intervention (unengaged in program; completed < 4 sessions) (n = 256) [†]			
Non-Minority (n = 52)	36.36%	.77 (1)	<i>p</i> = .796
Minority (n = 43)	38.05%		
Referral (No treatment for ED problems in the past 6 months) (n = 245)			
Non-Minority (n = 190)	78.57%	2.119 (1)	<i>p</i> = .183
Minority (n = 191)	85.71%		

[†]Note. Due to the change in online platform in year 2, engagement from year 1 was not included in engagement rates.

Table 4.

Barriers to Research Reported by Participants who Screened Positive for an ED but did not Complete Baseline (n = 19)

Research Barriers	% “Agreed” or “Strongly Agreed”
1. I had no interest in participating in research.	10.0%
2. I had no interest in body image or eating behavior research.	5.0%
3. I was concerned about my privacy.	40.0%
4. I mistrust researchers.	5.0%
5. I was too busy for research.	55.0%
6. Research does not target minorities.	15.0%
7. This research topic is not representative of my racial/ethnic group.	10.0%
8. I believe research has no value.	0.0%
9. The program content did not seem inclusive of my personal beliefs about eating disorder, body image, beauty, etc.	0.0%
10. I didn’t have a computer or smartphone to participate in the online research.	0.0%
11. I was concerned about using too much of my data plan on my phone.	0.0%
12. I did not have reliable access to the Internet.	0.0%

Note. All items rated on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale.

Table 5.*Barriers to Using Program Intervention Reported by Participants Utilized Less < 4 Sessions of Intervention (n = 11)*

Treatment Barriers	% “Agreed” or “Strongly Agreed”
<i>Please select how much you agree or disagree with the following statements regarding possible barriers to participating in this research program...</i>	
1. I had no interest in participating in research.	9.1%
2. I had no interest in body image or eating behavior research.	0.0%
3. I was concerned about my privacy.	18.2%
4. I mistrust researchers.	0.0%
5. I was too busy for research.	72.7%
6. Research does not target minorities.	9.1%
7. This research topic is not representative of my racial/ethnic group.	0.0%
8. I believe research has no value.	0.0%
9. The program content did not seem inclusive of my personal beliefs about eating disorder, body image, beauty, etc.	18.2%
10. I did not want to share my personal behaviors and thoughts through on an online program.	9.1%
11. I did not want to share my personal behaviors and thoughts with the offered coach.	45.5%
12. I did not feel that the coach would understand my cultural experiences and/or influences of my racial/ethnic identity.	45.5%
13. I didn’t have a computer or smartphone to participate in the online research.	9.1%
14. I was concerned about using too much of my data plan on my phone.	18.2%

15. I did not have reliable access to the Internet.

18.2%

Note. All items rated on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale.

Table 6.

Barriers to Seeking Treatment Reported by Control Group Participants Who Reported Not Receiving Any Treatment For Eating Problems in the Past Two Years (n = 63)

Treatment Barriers <i>In the past two years, I have not sought treatment for an eating problem because...</i>	% “Agreed” or “Strongly Agreed”
1. I felt shame or embarrassment	36.7%
2. I have not known where to go to find help	34.7%
3. I believed I should be able to help myself	65.3%
4. I worried about being labeled or judged	36.7%
5. I believed that my problem was not serious enough to warrant treatment	77.6%
6. Treatment was too expensive	40.8%
7. I have been unaware of the different treatment options available	34.7%
8. I have had a lack of trust in providers	40.8%
9. I have turned to other sources of support such as family and friends	46.9%
10. I have had a lack of social support for seeking treatment	28.6%
11. I worried that providers would lack expertise or not understand my issues	26.5%
12. I have not believed that an eating disorder is a psychological problem	22.4%
13. I have had a fear of being separated from my family	22.4%
14. I am scared that my family would disapprove if they found out	30.6%
15. I have not had transportation to get to treatment	18.4%

16. I have been concerned about stigma	36.7%
17. In my culture, people do not seek out mental health care treatment	30.6%
18. People of my racial/ethnic background do not have eating disorders	18.8%
19. In my culture, it is frowned upon to discuss topics related to mental health and treatment	34.7%
20. I did not have time to seek treatment	51.0%
21. I have been very happy with my weight	4.1%
22. I do not believe that I have any problems with my eating or weight	12.2%

Note. All items rated on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale.