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Body-, eating-, and exercise-related social comparison behavior and disordered eating in college women in the U.S. and Iran: A cross-cultural comparison

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Introduction

Though once considered to be an exclusively Western phenomenon, disordered eating symptoms are increasingly identified as a worldwide issue (Hoek, 2016). Research in the last decade has examined prevalence of disordered eating in both the United States (U.S.) and Iran (Rauof et al., 2015; Sahlan, Saunders, Mond, & Fitzsimmons-Craft, in press; Udo & Grilo, 2018), and found the rates to be similar. Approximately 17% of the U.S. college women meet the criteria for high-ED-risk (Lipson & Sonnevile, 2017) and those living in Muslim countries are at risk of developing a clinical eating disorder (ED; Thomas et al., 2018). Sociocultural pressures for thinness and thin-ideal internalization are implicated in the development and maintenance of disordered eating in Western young adult women (Culbert, Racine, & Klump, 2015). These findings extend to Chinese undergraduate women (Jackson, Jiang, & Chen, 2016). Research on these interrelations is in nascent stages in Iranian college women (Sahlan, Saunders, Fitzsimmons-Craft, & Taravatroy, 2020).

As proposed by Festinger's (1954) social comparison theory, each person possesses an innate drive to assess their attitudes, opinions, and abilities through comparisons to relevant others. A growing body of literature identifies that body-, eating- and exercise-related comparison are each associated with disordered eating and predict disordered eating symptoms (Fitzsimmons-Craft, Bardone-Cone, & Harney, 2012; Fitzsimmons-Craft et al., 2014; Fitzsimmons-Craft, Ciao, & Accurso, 2016). Driven by sociocultural factors promoting the thin-ideal, women engage in social comparison with both familiar and unfamiliar others and identify a discrepancy between their ideal and actual selves (Fitzsimmons-Craft, 2011; Fitzsimmons-Craft et al., 2016) and may aim to address that discrepancy through disordered eating behaviors. This link between body-related social comparison and disordered eating symptoms is also evident in Chinese female samples (Jackson et al., 2016).

East vs. West: Cultural Differences in Social Comparison

Social comparison is an important ED antecedent and maintenance factor; however, differences in cultural norms may lead to dissimilarities in the frequency and implications of this social-cognitive process (White & Lehman, 2005). One important cultural factor is the way in which Eastern and Western cultures view the self. The Eastern cultural view of the self as collectivistic and communal (Markus & Kitayama, 1991) leads individuals to be interdependent and maintain their self-esteem by fitting into their social and cultural group (Cross, Hardin, & Gercek-Swing, 2011). Interdependent self-construal is the extent to which people construe the self as being fundamentally connected to other people. Individuals with high interdependent self-construal focus strongly on their relationships with others and are concerned with the ways in which they can benefit their social group (Giacomin & Jordan, 2017). However, the accuracy of categorizing Iranians as high in interdependent self-construal has been questioned (Ghorbani et al., 2004; Nordfjærn & Zavareh, 2016). Nordfjærn and Zavareh (2016) found that Iranians endorsed comparable scores on measures of individualism and collectivism. In contrast, individuals from Western, individualistic cultures are more likely to highlight their unique characteristics to bolster self-esteem (Cross et al., 2011). Although contradictory to prior research, both Iranian and U.S. samples reported comparable scores on individualism and collectivism in another study (Ghorbani et al., 2004). Although cultural differences have historically been found in views of the self, it is unclear if these differences persist, and if they can be extended to ED-related social comparisons. Thus, these issues merit further investigation. Though as yet unstudied, interdependent self-construal may also be linked to greater engagement in eating- and exercise-related social comparison, as these women are increasingly attuned to the behaviors of others around them.

Conversely, this nuanced effect of interdependent self-construal may not apply to certain types of comparisons for women in Eastern cultures in which women cover their bodies, including Iran. For example, head and body covering and/or mandated hijab-wearing may limit direct opportunities for appearance-related social comparison and may reduce their frequency and function among Iranian women comparing themselves with their Iranian counterparts. Research indicates that Iranian hijab-wearing college women endorsed lower mean scores on the Physical Appearance Comparison Scale-Revised (i.e., PACS-R; Atari et al., 2015; Sahlan, Akoury, & Taravatrouy, 2020) compared to the U.S. college women (i.e., Schaefer & Thompson, 2014). However, irrespective of hijab, body-related social comparison contributed to disordered eating in Iran. Accordingly, one study with a community sample of Iranian hijab-wearing women indicated that body-related comparison is associated with disordered eating (Garrusi & Baneshi, 2013). Another study among Iranian hijab-wearing adolescent women reported that body-related social comparison was implicated in body image (Shahyad et al., 2018). Only one study to date has examined the effects of eating- or exercise-related comparison on disordered eating in Iranian hijab-wearing college women (Sahlan, Saunders et al., 2020).

Body Image and Disordered Eating in Iranian Women

The use of Islamic head and body cover, also known as hijab (i.e., Islamic-head and body coverings), relates directly and uniquely to Muslim women's lived bodily experiences

(Tolaymat & Moradi, 2011). Iran is one of the few places in the world where the wearing of hijab is *legally* mandated by the government since the revolution of 1979. The vast majority of research to date, however, has focused on women who elect to wear the hijab. For example, Muslim women who elect to regularly wear a hijab in the U.S., Serbia, France, and Great Britain report lower body dissatisfaction, thin-ideal internalization, and pressures for thinness compared to Muslim women who do not regularly wear a hijab (Dunkel et al., 2010; Durovic et al., 2016; Kertechian & Swami, 2017; Swami et al., 2014). Less frequent wearing of a hijab is significantly correlated with greater body dissatisfaction, drive for thinness, and bulimic tendencies among French Muslim women (Kertechian & Swami, 2017). However, a recent experimental study showed that body satisfaction decreased for veiled Muslim women upon viewing thin idealized images compared to women who viewed images of furniture, suggesting that the hijab may not fully buffer against body dissatisfaction and sociocultural messages (Wilhelm et al., 2019). Another study reported that though hijab had a lower association with positive body image in a sample of Israeli Muslim women; the association of hijab with body image concerns was not significant (Sidi et al., 2020). These findings predominantly come from communities where the hijab is voluntary and Muslims are a minority.

However, findings on body image and disordered eating in community and college samples from Iran show comparable prevalence to global levels (i.e., 30–75%; Garrusi & Baneshi, 2013; Naeimi et al., 2016; Sahlan, Taravatrouy, Quick, & Mond, 2020; Shoraka, Amirkafi, & Garrusi, 2019). Iranian culture may reflect increased Westernization in recent years. Anecdotally, the use of Instagram is increasing in Iran. In a sample of Iranian college women, exposure to Western media (especially via uncensored social media, such as Instagram; Sharifi et al., 2016) may be a particularly salient influence on body image as it was associated with negative body image in Iranian hijab-wearing college women. These findings may indicate that the hijab does not fully protect against body dissatisfaction and/or disordered eating. Moreover, one study suggests that hijab is not directly associated with body image concerns in a sample of community women (Pahlevan Sharif, Ahadzadeh, & Ong, 2019). Taken together, these findings may demonstrate the fact that the protective effect of the hijab may be diminished in cultures, such as Iran, where its wearing is compulsory.

Current Research

Given the prior mixed results regarding potential buffering effect of hijab-wearing, and the lack of research on ED-related social comparison and disordered eating in countries where the hijab is mandatory, this study examined these constructs and their interrelations in a sample of Iranian women. Levels of social comparison and ED cognitions and psychopathology in Iranian and U.S. college women were also compared. Social comparison has been identified as a robust predictor of the development of clinically significant ED behavior in U.S. college samples (Arigo et al., 2014). To date, few ED risk factors for hijab-wearing women have been identified (Dunkel et al., 2010; Durovic et al., 2016; Kertechian & Swami, 2017; Swami et al., 2014). The current study thus presents important information on a non-clinical risk factor in an understudied population.

This study evaluated mean levels of ED-related social comparison tendencies (Aim 1), core ED cognitions (i.e., overvaluation of weight and shape; Fairburn, Cooper, & Shafran, 2003) and key ED behavioral indicators (i.e., binge eating, purging, excessive exercise, and dietary restraint; Aim 2), and the interrelations between the two (Aim 3) in Iranian and U.S. women. Given prior findings regarding lower body-related comparisons in Iranian vs. U.S. college women (Atari et al., 2015; Sahlan, Akoury et al., 2020; Schaefer & Thompson, 2014), we hypothesized that the U.S. women would engage in more frequent social comparison behaviors than Iranian women (H1). Additionally, we postulated that U.S. women would report higher levels of ED-related cognitions and behaviors than Iranian women (H2). As the interrelations between ED-related social comparison tendencies and ED cognitions and behaviors have not yet been examined in non-Western cultures, our third hypothesis was exploratory, examining similarities and differences in the strengths of the relations between ED-related social comparison tendencies and disordered eating outcomes.

Method

Participants

Participants were 564 college women from U.S. ($n = 180$) and Iran ($n = 384$). Participants were recruited via university classrooms (Iran), social media (U.S.), and the psychology undergraduate extra credit research pool (U.S.). None of the participants were offered remuneration for their participation beyond extra credit. The U.S. women's age ranged from 18–65 ($M = 26.14$, $SD = 6.13$); 10 participants failed to provide their age. Iranian women's age ranged from 18–54 ($M = 21.91$, $SD = 3.89$). On average, U.S. women were older than Iranian women ($t = 9.78$, $p < .001$, $d = .82$). We include age as a covariate in all analyses.

Procedure

The current study is a secondary data analysis of survey data collected for scale validation studies (Saunders, Eaton, & Fitzsimmons-Craft, 2019; Sahlan, Saunders et al., 2020). The data were collected at overlapping points in time in U.S. (2017–2018) and Iran (2016–2017). After consenting, U.S. college women were routed to the survey on an online survey platform. Iranian college women were given the paper-pencil version of the questionnaires to complete in the presence of the author, as online survey platforms are not yet used at Iranian universities. All research was approved by the respective university ethics boards.

Measures

Body, Eating, and Exercise Comparison Orientation Measure (BEECOM).—The BEECOM in English (Saunders et al., 2019) and Farsi (Sahlan, Saunders et al., 2020) were administered to U.S. and Iranian participants, respectively. Participants responded to six items related to body comparison, four items related to eating comparison, and five items related to exercise comparison of the 18-item BEECOM (Fitzsimmons-Craft et al., 2012). Possible responses ranged from 1 (*Never*) to 7 (*Always*). Participants were asked to rate the frequency with which they engaged in comparisons of these types to a same-sex peer. The full 18-item BEECOM was administered to U.S. participants. However, given that three items were removed due to cross-loading in Iranian study (Sahlan, Saunders et al., 2020), we only analyzed the 15 items for the purposes of cross-cultural comparison. Both F-BEECOM

and BEECOM show adequate reliability and validity. With respect to Cronbach's alphas from the current sample, please see the bottom of Table 2.

Eating Disorder Examination-Questionnaire (EDE-Q 6th).—The EDE-Q in English (Fairburn & Beglin, 2008) and Farsi (Mahmoodi et al., 2016; Sahlan, Taravatroy et al., 2020) were administered to assess disordered eating. The Farsi version with cultural and linguistic equivalency and appropriateness was used in this study (Mahmoodi et al., 2016; Sahlan, Taravatroy et al., 2020). In this study, we administered the dietary restraint subscale of the EDE-Q and questions that asked about the frequency with which eating disorder behaviors were engaged over the past 28 days. Two items of weight concern and shape concern subscales were averaged to form a composite “overvaluation of weight and shape” item which reflects the core psychopathology of EDs (Fairburn et al., 2003). Binge eating and excessive exercise were each quantified by the number of times an individual endorsed these behaviors over the past 28 days. We combined each of the behavioral items related to self-induced vomiting and laxative misuse into one purging index. We used objective bulimic episodes (had a sense of losing control over your eating and ate an unusually large amount of food) to assess binge eating. The EDE-Q is both reliable and valid in U.S. (Luce et al., 2008) and Iranian (Sahlan, Saunders, Mond, & Fitzsimmons-Craft, in press; Sahlan, Taravatroy et al., 2020) samples. Cronbach's alphas from the current sample appear in Table 2.

Statistical Analyses and Data Screening

We used SPSS-25 to complete all statistical analyses. A series of One-Way Analyses of Covariance (ANCOVA) tested mean differences on BEECOM subscale scores (H1), dietary restraint, overvaluation of weight and shape, binge, purge, and excessive exercise behaviors (H2) by country while controlling for age. Partial correlation coefficients were calculated to quantify the degree of association between ED-related comparison tendencies and disordered eating cognitions and behaviors. These coefficients were compared to one another using Fisher's z tests (H3). A power analysis at .80 and alpha at .05 to detect significant differences between groups indicated the need for 251 total participants; our sample met this recommendation. The Iranian data set was not missing any data, while the missingness for the U.S. group ranged from 0–11.9% per BEECOM or EDE-Q item, with 42 participants missing data at the item level. The missing EDE-Q data for the U.S. group were not missing at completely random (MCAR), Little's MCAR, $X^2(62)=99.86, p < .002$. Therefore, all missing data were imputed in SPSS using Expectation-Maximization (EM), shown to produce relatively unbiased estimates both for item-level missing data (Enders, 2003) and data not missing at random (Little, 1988).

Results

Women in the U.S. reported greater body-, eating-, and exercise-related comparisons, dietary restraint, and overvaluation of weight and shape compared to Iranian women after controlling for age. In contrast, the differences in binge eating, purging, and excessive exercise were non-significant after controlling for age across U.S. and Iranian women. The

effect sizes of these differences ranged from small ($\eta^2 = .01$ for excessive exercise) to large ($\eta^2 = .15$ for dietary restraint) after controlling for age (see Table 1).

Hypothesis one was supported; aligned with our expectation, women in the U.S. engaged in more body-, eating-, and exercise-related comparison than Iranian women. Hypothesis two was partially supported; US women reported higher dietary restraint and overvaluation of weight and shape compared to Iranian women. No group-level differences were evident for binge, purge, or exercise behaviors (see Table 1). The Partial correlations for each sub-scale of the BEECOM and ED cognitive and behavioral indicators are reported in Table 2. Partial correlations ranged from .04-.91 for U.S. women and from .08-.88 for Iranian women. A series of Fisher's z tests revealed that the correlations between body comparison ($z = 2.15, p < .05$), eating comparison ($z = 2.38, p < .05$), exercise comparison ($z = 2.1, p < .05$), and overvaluation of weight and shape ($z = 2.78, p < .01$) with binge eating were significantly stronger for US women than for Iranian women. The strengths of the interrelations among other variables did not differ significantly by country.

Discussion

To the best of our knowledge, this was the first known study to examine eating disorder-related social comparison and disordered eating in the U.S. and Iranian college women. Consistent with hypotheses, mean levels of body, eating, exercise-related social comparison and disordered eating symptoms were higher in US women than Iranian women, even after controlling for age. However, binge and purge behaviors were comparable across cultures. Also, consistent with our hypothesis, we found that eating disorder-related social comparison and disordered eating symptoms were inter-correlated in each culture; these associations between variables were stronger for the U.S. women compared to Iranian women.

Each of these findings has important implications for future research and clinical practice. Women in the U.S. endorsed higher levels of body-, eating-, and exercise-related social comparison and higher levels of dietary restraint and overvaluation of weight and shape than Iranian women. While reported dietary restraint and body dissatisfaction levels for Iranian women in the current sample were lower than those previously found among Western women (Luce et al., 2008; Mitchison et al., 2017; Rose et al., 2013), reported mean scores for binge and purge behaviors were similar in both samples in the current study and reported levels are also in line with another study among U.S. college women (Rose et al., 2013). Previous research among women with voluntary hijab highlighted the buffering nature of religious dress (Kertechian & Swami, 2017); however, research has indicated that the hijab may not function as a protective factor against body image concerns in cultures, like Iran, where it is compulsory, potentially because the wearing of hijab is standard across all women (Pahlevan Sharif et al., 2019). Another possible factor may be the effects of religiosity or religious pride in a sample of community women from Iran (Pahlevan Sharif et al., 2019). Religious rituals such as prayer could also serve as further protection for women, above and beyond the wearing of hijab (Henderson & Ellison, 2015).

The current findings may demonstrate that binge and purge behaviors are high among Iranian college samples (Sahlan, Taravatroy et al., 2020). Moreover, the clinical disordered eating symptoms (i.e., 4 EDE-Q global score; Luce & Crowther, 1999) in Iranian women (i.e., 4.0%; Sahlan, Akoury et al., 2020) nearly match those of US college women (5–6%; Habashy & Culbert, 2019; Quick & Byrd-Bredbenner, 2013). The overall salience of the disordered eating symptoms among Iranian women suggests an effect of adapting Western beauty standards, though further empirical investigation is necessary to substantiate this hypothesis. Anecdotally, despite official Western media censorship, Iranians demonstrate increased familiarity with Western media, via the international Dish television network and online social media (e.g., Instagram; Sharifi, et al., 2016). These changes in media consumption may have shifted the standards of appearance ideal and body weight (Sharifi, et al., 2016). Studies have recently reported a major shift in Arab females' desire for a thin body image instead of a once idealized plump physique (Eshak et al., 2020; Eapen et al., 2006). This trend may be stronger among Iranian college women, a particularly high-risk group (Berg et al., 2009). However, there may other reasons, including living standard, government, and individual freedom which need to be examined in the future to best understand the cultural drivers of disordered eating behavior.

The interrelations among ED-related social comparison tendencies and disordered eating outcomes (i.e., overvaluation of weight and shape, binge eating) were significantly stronger for the U.S. women than for Iranian women. However, there is evidence to note that body image-related social comparison is being implicated in disordered eating in Iran (Garrusi & Baneshi, 2013; Sahlan, Saunders et al., 2020). In light of the current findings, future research should examine whether ED-related social comparisons are antecedents to disordered eating behavior and the development of a clinically significant ED profile in Iranian women, as has previously been found in Western samples (Arigo et al., 2014). Moreover, the relationship between cognitive and behavioral indicators of disordered eating symptoms with BEECOM subscales suggested that purge behaviors are implicated in multiple domains of social comparison within Iranian culture as the occurrence of purge behaviors are high among Iranian college women (Sahlan, Taravatroy et al., 2020). However, as prior research has identified key cultural differences in the conceptualization of self and function of general social comparison behavior (White & Lehman, 2005), it is imperative to account for social comparison motive to optimize the efficacy of future intervention and prevention strategies.

The current findings are the first to examine cross-cultural similarities and differences in ED-related social comparison yet are limited in several ways. Our use of cross-sectional data precludes the ability to draw any causal influences, and future prospective research is needed. Given that hijab was not associated with disordered eating symptoms in a sample of community women from Iran but that religiosity was (Pahlevan Sharif et al., 2019), replicating this study by examining hijab and religiosity as moderator factors would be necessary in future studies in Iran. Moreover, despite the anecdotally observed accessibility of main stream Western media in Iran and its impact on body image concerns using Instagram (Sharifi et al., 2016), we did not directly measure the extent of exposure to Western and local media in connection to ED-related social comparison disordered eating. As such, future studies should include a survey of mainstream media access and exposure among Iranians. Additionally, the study included only college women. These results cannot

be generalized to other populations, which should be investigated in the future. A final limitation was the use of different methods (paper-pencil version vs. Qualtrics) to collect data, and the inability to conduct analyses of measurement equivalence between the two samples. These limitations notwithstanding, the current research provides foundational knowledge concerning Eastern and Western cultural similarities and differences in ED-related social comparison. Lastly, we recommend examining other cultural differences and their associations with social comparison and disordered eating symptoms in future studies.

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Table 1. Comparisons of BEECOM Subscales and Disordered Eating Symptoms among U.S. and Iranian College Women.

	U.S.		Iran		Cohen's <i>d</i>		ANCOVA controlling for age	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>F</i> ^{<i>a</i>}	Partial η^2
BEECOM								
Body Comparison	18.24	9.18	14.59	8.33	.42		12.77**	.02
Eating Comparison	14.93	5.86	11.30	5.84	.62		35.98**	.06
Exercise Comparison	21.50	7.45	16.44	8.33	.64		35.09**	.06
Global Score	54.68	20.25	42.34	19.81	.62		32.57**	.06
Disordered eating symptoms								
Dietary Restraint Subscale	2.48	1.43	1.09	1.32	1.01		93.08**	.15
OEWS	3.28	2.01	2.08	1.91	.61		29.24**	.05
Binge behaviors	2.87	4.27	2.71	4.12	.04		.021 ^{<i>b</i>}	.00
Purge behaviors	.87	4.49	.51	2.45	.01		.162 ^{<i>b</i>}	.00
Excessive exercise	1.84	4.96	1.15	3.67	.16		2.98 ^{<i>b</i>}	.01

Note: BEECOM = Body Comparison, Eating Comparison, Exercise Comparison, Global Score; Disordered eating symptoms = Dietary Restraint; OEWS = Overvaluation of weight and shape.

^{*a*}. *df*(1,552)

***p* < .01

^{*b*} Not significant

Partial Correlations among BEECOM Subscales and Disordered Eating Symptoms among U.S. and Iranian College Women, After Controlling for Age.

Table 2.

	1	2	3	4	5	6	7	8	9
1. Body Comparison	-	.73 ^{***}	.63 ^{***}	.89 ^{***}	.43 ^{***}	.40 ^{***}	.44 ^{***}	.08 ^d	.28 ^{***}
2. Eating Comparison	.67 ^{***}	-	.77 ^{***}	.91 ^{***}	.35 ^{***}	.47 ^{***}	.44 ^{***}	.04 ^d	.17 [*]
3. Exercise Comparison	.60 ^{***}	.71 ^{***}	-	.88 ^{***}	.38 ^{***}	.50 ^{***}	.32 ^{***}	.07 ^d	.11 ^d
4. Global Score	.87 ^{***}	.87 ^{***}	.88 ^{***}	-	.44 ^{***}	.50 ^{***}	.45 ^{***}	.07 ^d	.22 [*]
5. Dietary Restraint	.31 ^{***}	.29 ^{***}	.33 ^{***}	.36 ^{***}	-	.40 ^{***}	.27 ^{***}	.14 ^d	.32 ^{***}
6. OEWS	.41 ^{***}	.47 ^{***}	.54 ^{***}	.54 ^{***}	.38 ^{***}	-	.46 ^{***}	.10 ^d	.18 [*]
7. Binge behaviors	.27 ^{***}	.25 ^{***}	.28 ^{***}	.31 ^{***}	.28 ^{***}	.24 ^{***}	-	.21 ^{**}	.24 ^{***}
8. Purge behaviors	.21 ^{***}	.13 [*]	.14 [*]	.18 ^{***}	.20 ^{***}	.22 ^{***}	.15 [*]	-	.09 ^d
9. Excessive exercise	.24 ^{***}	.08 ^d	.14 [*]	.19 ^{***}	.24 ^{***}	.17 ^{***}	.28 ^{***}	.18 ^{***}	-
Cronbach's α									
U.S.	.93	.87	.93	.95	.79	.94	-	-	-
Iran	.91	.79	.91	.94	.82	.89	-	-	-

Note. U.S. results are above the diagonal; Iranian results are below the diagonal.

* $p < .05$

** $p < .01$

*** $p < .001$

^d Not significant