Archives of Sexual Behavior (2020) 49:2893–2905
https://doi.org/10.1007/s10508-020-01805-9

ORIGINAL PAPER

A Typology of Women with Low Sexual Desire

Siobhan E. Sutherland[1] · **Uzma S. Rehman**[1] · **Jackson A. Goodnight**[2]

Received: 25 June 2019 / Revised: 10 July 2020 / Accepted: 18 July 2020 / Published online: 8 September 2020

Abstract
Low sexual desire is the most common sexual issue reported by women and research suggests that the presentation and experience of low sexual desire may vary considerably between women. This study explored whether women with low desire differ qualitatively from one another based on several key contextual factors theoretically associated with low desire. We collected data from women in long-term relationships ($N = 508$) using an online platform. Using latent profile analysis, we explored whether women could be distinguished from one another based on several contextual variables (sexual and relationship satisfaction, life stress, sexual communication). Results supported a 3-profile solution, with two distinct profiles emerging for women with low sexual desire. The first profile consisted of women with low desire who were dissatisfied with the sexual and nonsexual aspects of their relationships (Globally Distressed Group: 8%). The second profile consisted of women with low desire who were sexually, but not relationally, dissatisfied (Sexually Dissatisfied Group: 24%). In addition, a third profile emerged that consisted of generally satisfied women with average desire (Average Desire Group: 67%). *t*-tests revealed that the two low desire groups shared similar mean levels of sexual desire, but that their overall presentations were conceptually distinct. This research supports a categorical conceptualization of low sexual desire in women and suggests that evaluating category membership for women with low desire can provide valuable information about women's sexual experiences beyond assessing mean levels of sexual desire alone.

Keywords Low sexual desire · Women's sexuality · Typology · Romantic relationships · DSM-5

Introduction

A sex therapist is seeing two different female clients who are seeking treatment for low sexual desire. The first client, Michelle, is quite satisfied in her romantic relationship, but is generally disinterested in sexual activity and is unhappy with her sex life as a whole. The second client, Claire, cites high relationship conflict and general dissatisfaction with her romantic partner, which has coincided with a decrease in Claire's desire to engage in sex. Michelle appears to have low desire that presents primarily as a sexual problem, while Claire is experiencing relational problems that correspond with reduced sexual interest. While these women share a common presenting problem, the context of their sexual problems is different. The current study investigated whether women with low sexual desire are best conceptualized as one unitary group that experiences quantitative, but not qualitative differences in their desire, or whether there are qualitatively distinct subtypes of women with low desire.

Much of the past empirical work has treated women with low sexual desire as a unitary group that generally shares a common experience (e.g., Hurlbert, Apt, Hurlbert, & Pierce, 2000; MacPhee, Johnson, & van der Veer, 1995; Mintz, Balzer, Zhao, & Bush, 2012). However, with close to 40% of women reporting low sexual desire over the course of a year (Laumann, Paik, & Rosen, 1999), we wondered whether this large subset of women really do share a common experience or whether they are part of a more conceptually diverse group.

Heterogeneity Among Women with Low Sexual Desire

There is theoretical and empirical writing to suggest that there may be important qualitative differences among women with low sexual desire. As was the case with Claire and Michelle in the above scenario, research suggests that women with low sexual desire, or a lack of motivation to pursue and/or become receptive

✉ Siobhan E. Sutherland
siobhan.sutherland@uwaterloo.ca

[1] Department of Psychology, University of Waterloo, 200 University Ave. W., Waterloo, ON N2L 3G1, Canada

[2] Department of Psychology, University of Dayton, Dayton, OH, USA

to sexual activity (Basson, 2008), are a heterogeneous group. For example, women with low desire tend to differ in reports of desire-related distress (Rosen et al., 2009), satisfaction with sexual functioning (Ferenidou et al., 2008), sexual satisfaction (Bridges & Horne, 2007), and help-seeking behavior (Ferenidou et al., 2008; Laumann et al., 1999). Further, in a study examining variability in women's sexual responses, Leavitt, Leonhardt, and Busby (2019) found that a variety of patterns in women's desire levels over the course of a single sexual experience were associated with positive sexual and relational outcomes. The authors therefore concluded that women in satisfying sexual relationships may display a diverse range of patterns in their desire levels.

Some of our understanding regarding heterogeneity in women with low sexual desire is informed by past studies that have investigated women's sexual problems more broadly. Given that desire problems are the most frequently reported sexual problems for women (Laumann et al., 1999, 2005), it is reasonable to extrapolate some of these results to inform our understanding of women's sexual desire. One way to examine diversity among women with sexual dysfunction is to determine how they differ with respect to various sexual outcomes. For example, in a study of women with different types of sexual problems (e.g., low sexual desire, sexual pain, orgasmic disorders), Ferenidou et al. (2008) found that women who have sexual problems tend to differ from one another in their perceptions of their sexual functioning. Specifically, 80% of their total sample was satisfied with their sexual functioning despite the fact that 69.5% of the participants had at least one self-reported sexual problem. This finding suggests that women with sexual problems are not unilaterally unhappy with their ability to engage in sexual activity and that it should not be assumed that women with sexual difficulties share a common experience. In addition, research has shown that many women with low sexual desire do not experience associated distress. For example, Rosen et al. (2009) found that among a sample of 10,429 women with low sexual desire, only 27.5% reported associated distress. This work shows that many women with low sexual desire are not particularly distressed by the issue and suggests that specific variables may separate sexually distressed from nondistressed individuals. Others have shown high variation in women's motivation to seek treatment for sexual problems. For example, Laumann et al. (1999) found that just 20% of women who experience sexual dysfunction seek professional help for the issue. Despite the fact that these studies have focused on women's sexual dysfunctions more generally, low sexual desire was consistently the leading sexual problem reported by women across studies. Taken together, this research suggests that women experience sexual dysfunctions, including low sexual desire, in diverse ways. We were interested in exploring the variables that distinguish distinct groups of women with low desire. To this end, we sought to develop a typology of women with low desire to elucidate whether women can be classified based on distinct response patterns across several environmental, sexual, and relational variables.

Gender and Sexual Desire

The current study focused on women's sexual desire for several reasons. First, despite a growing body of research which speaks to the similarities in women and men's desire (e.g., Carvalho & Nobre, 2011; Dawson & Chivers, 2014), some key gender differences have been documented in the literature. For example, women and men tend to differ with respect to mean levels of dyadic and solitary desire, frequency of masturbation and sexual fantasizing, desired number of sexual partners, desired frequency of sex, and the goals related to their sexual desire (Baumeister, 2000; Dosch, Rochat, Ghisletta, Favez, & Van der Linden, 2016; Mark, Herbenick, Fortenberry, Sanders, & Reece, 2014). An additional empirically supported gender difference in sexual desire, and one that is particularly relevant to the current study, is the extent to which contextual factors contribute to men's and women's desire for sex. Research has shown that women's sexual desire tends to be more variable and context-dependent than men's desire. Baumeister (2000) coined the term "erotic plasticity" to describe the observed variability in women's sexual desire across cultures and life circumstances. Given the robust link between contextual factors and sexual desire for women, we chose to conduct a within-gender study aimed at identifying whether variations in contextual variables could be used to identify distinct subgroups of women with low desire. Next, we describe the specific variables that we expected to distinguish between low desire groups.

Women's Sexual Desire and Context

While research suggests that women's experiences with low sexual desire differ with regard to intrapersonal (e.g., sexual attitudes, sexual functioning, sexual history) and interpersonal (sexual and relationship satisfaction) contexts, it is important to understand *why* these differences might exist. One possible explanation for these differences relates to the principle of equifinality, which states that one particular outcome may be reached via several disparate paths. Related to the current research, it is possible that women with low sexual desire share a similar outcome, but have followed unique trajectories to get to this point. Basson (2000, 2001) has proposed a model of the female sexual response cycle that illustrates the broad range of biological, psychological, relational, and environmental factors that contribute to and/or detract from a woman's motivation to engage in sexual activity. For example, a woman may feel less inclined to pursue sex with a romantic partner if intimacy in the relationship has been undermined by high relational conflict, a lack of close connection, or previous negative sexual experiences. Likewise, a woman who is experiencing particularly high life stress (e.g., financial hardship, loss of a loved one) may have difficulty prioritizing or focusing on sexual activity. Based on Basson's model, as well as related clinical, theoretical, and empirical evidence, we expected to find distinct subgroups of women with low sexual

desire that could be distinguished from one another based on group differences in the following four contextual variables.

Relationship Satisfaction

Sharing a close emotional bond with a romantic partner is a consistent predictor of sexual desire (e.g., Mark & Lasslo, 2018). While research has shown that intimacy is associated with sexual desire in men and women, this link appears to be particularly strong for women (Birnbaum et al., 2016). Couples who engage in relationship undermining behaviors (e.g., poor conflict management, negative communication, avoidance) tend to be more emotionally and physically distant (Birnbaum, Mikulincer, & Austerlitz, 2013), and less inclined to engage with one another sexually (Basson, 2001). It is therefore possible that, for a subset of women, low relationship satisfaction is associated with decreased sexual desire.

Sexual Satisfaction

Perhaps unsurprisingly, sexual desire and sexual satisfaction are closely linked constructs (Dosch et al., 2016). Štulhofer, Ferreira, and Landripet (2014) have shown that higher sexual desire not only predicts increases in one's own sexual satisfaction, but also predicts increases in estimates of one's partner's sexual satisfaction. Given the robust link between sexual satisfaction and desire, we expected to find that low sexual satisfaction is a primary concern for one subset of women with low sexual desire.

Life Stress

The relationship between sexual desire and stress is a topic of increasing interest to sex researchers. Mark and Lasslo (2018) suggested that this topic is of particular relevance to couples in long-term relationships as they jointly navigate countless life stressors over time. Research has shown a link between lack of energy and low sexual desire in women (Murray & Milhausen, 2012), a finding which may reflect the reality that women continue to take on the majority of unpaid emotional and household labor, regardless of work hours and income level (Horne, Johnson, Galambos, & Krahn, 2018). Indeed, Bodenmann, Ledermann, Blattner, and Galluzzo (2006) showed a link between daily stress and clinically low sexual desire in women after controlling for relationship satisfaction and psychopathology. In this study, we expected to find that one subset of women with low sexual desire would report high associated life stress.

Sexual Communication

Research suggests that actively discussing sexual problems can act as a buffer against negative relational outcomes (e.g., Cupach & Comstock, 1990; Rehman, Rellini, & Fallis, 2011). Specifically, research has shown that regular sexual communication contributes to the maintenance of desire in long-term relationships (Mark & Lasslo, 2018; Murray & Milhausen, 2012) and can help couples with desire discrepancies maintain satisfying sexual relationships (Herbenick, Mullinax, & Mark, 2014). Given the link between sexual communication and satisfaction in relationships, we expected that the subsets of women struggling with low sexual satisfaction, low relationship satisfaction, and high life stress would also engage in poor quality sexual communication. That is, poor sexual communication may be linked with greater dissatisfaction and stress in the relationship and act as a maintaining factor in low sexual desire for women.

The above research highlights that multiple factors are associated with the experience of low sexual desire in women. While we know that these variables tend to impact sexual desire, it is unclear whether they can be used to distinguish between subgroups of women with low desire. The current study aimed to extend what is currently known about the link between contextual factors and low desire by examining whether women fall into distinct groups based on their standing on each of these variables.

The Current Study

The first goal of our study was to examine whether women with low sexual desire are best conceptualized as one homogenous group or as unique subtypes. We predicted that we would find 4 subgroups of women with low desire. The first group was expected to consist of women who were largely satisfied with the sexual and nonsexual aspects of their romantic relationships (Satisfied Group). It is possible that this subset of women use constructive techniques, such as positive sexual communication, to discuss their low desire and negotiate various ways to maintain sexual and nonsexual intimacy in their relationships. A second group of women was expected to be primarily dissatisfied with the sexual aspects of their romantic relationship (Sexually Dissatisfied Group). For this group, low sexual desire was expected to mainly coincide with issues of sexual functioning and low sexual satisfaction, but not with low relationship satisfaction. Specifically, this group was hypothesized to have domain specific problems that pertained to the sexual as opposed to the nonsexual aspects of the relationship. We further expected that this group would engage in poor sexual communication, a factor that could serve to maintain their sexual dissatisfaction. In contrast, a third group of women was hypothesized to have a primary relationship problem (Globally Distressed Group). Unlike those with a primary sexual problem, whose difficulties are mainly confined to the sexual domain, women in this group were expected to experience more diffuse problems in their relationships (e.g., high conflict) that permeate both sexual and nonsexual relational domains. Therefore, we expected that women in this group would report similarly low sexual and relationship satisfaction. As with the previous group, we also anticipated that this group would engage in poor sexual communication which may be a factor that contributes to their overall distress.

The final proposed group consisted of women experiencing significant life stress (e.g., transition to parenthood, death of a loved one, job loss) (Life Stress Group). For this group, we expected that the presence of one or more acute stressors would shift women's focus away from sexual wants and needs, and thus reduce desire for sex. We expected that this group would experience relatively average relationship satisfaction as they might attribute their problems to specific stressors (e.g., job loss) and not to the relationship or their partner per se. We anticipated that this group would experience low sexual satisfaction given the link between poor sexual functioning and heightened stress (Bodenmann et al., 2006). As with the previous two groups, this group was expected to engage in poor sexual communication.

We decided to test our typology on women who report a broad range of sexual desire levels as opposed to focusing on a clinical sample. We made this decision for two reasons. First, research shows that the majority of women who report low sexual desire do not meet clinical criteria for Female Sexual Interest/Arousal Disorder as outlined in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (Brotto, 2017). Selecting only women with clinically low desire would cut out a large subset of the population of interest and reduce the generalizability of our findings. Second, we wanted to validate our typology by comparing any high versus low desire subtypes that emerged in the data. We tentatively expected that women in the high desire (comparison) subgroup would look similar to our Satisfied Group of women with low desire in that they would report generally positive sexual communication, high sexual and relationship satisfaction, and low life stress.

A second aim of this study was to empirically validate this typology by investigating mean differences between subgroups on their attributions for low sexual desire. Based on the defining characteristics of each subgroup, we expected to find significant between-group differences in attributions for low sexual desire. Attributions have been defined as an individual's attempt to explain the main causes of an outcome, event, or experience (Vannier, Adare, & Rosen, 2018). Attributions are generally measured along three independent continuums: global versus specific, internal versus external, and temporary versus stable (Bradbury & Fincham, 1992). Vannier et al. (2018) have cited a fourth dimension, partner responsibility, which is specific to couples' relationships, and reflects the extent to which a person considers their partner to be the cause of a certain experience (e.g., "I am unhappy with my sex life because my partner is too busy for sex"). Attributions for negative experiences that are more stable, internal, global, and assign blame to one's partner tend to be associated with negative outcomes including psychopathology (Graham, 1991), negative affect (McFarland & Ross, 1982), and relationship and sexual dissatisfaction (Jodoin et al., 2011). We expected to find meaningful differences in attributional styles between groups of women with low sexual desire. For example, if women in the Globally Distressed Group experience diffuse relational issues that spillover into the sexual and nonsexual domains of their relationships, we would expect them to have more global attributions for their low sexual desire than other groups. In contrast, women in the Sexually Dissatisfied Group were expected to report that their problems with low desire are specific to their sex life and do not significantly impact other life or relationship domains. Women in the Life Stress Group may see their low desire as more external and temporary than women in the Globally Distressed Group or women in the Sexually Dissatisfied Group, if they attribute it to acute environmental stressors. Finally, we would expect women in the Satisfied Group to report the most positive attributions relative to the other three groups (i.e., external, temporary, specific, low partner responsibility) as holding these constructive views on their low sexual desire may be one way that they maintain satisfaction in their relationships.

Method

Participants

Participants were recruited for the current study from Amazon Mechanical Turk, a large online participant pool. The recruitment material stated that female volunteers in long-term relationships were invited to participate in a 2-part online study designed to examine the relationship between sexuality and relationship outcomes in women. Research has shown a negative relationship between survey length and data quality (Galesic & Bosnjak, 2009). In an attempt to combat participant fatigue and improve the quality of our data, this study was divided into two 30-minute parts. To ensure that participants were reading and attending to questions carefully, validity questions (e.g., Select "agree" to show that you have read this question carefully) were randomly added to online questionnaires. To be eligible for the study, participants had to be female, at least 18 years old, in a long-term relationship of 1 year or more, and residing in the U.S. We recruited women who have been in their relationships for at least 1 year as research shows that desire peaks early on in relationships and levels off over time (Murray & Milhausen, 2012). We wanted to capture the experiences of women whose desire had stabilized following the initial stages of their relationships.

The initial sample consisted of 658 women who participated in at least Part 1 of the study. Of these participants, 120 were excluded from analyses because they did not complete both parts of the study (18.2% attrition rate). Due to validity concerns regarding data collection from online participant pools, several validity checks were conducted. First, we examined whether participants correctly responded to the validity questions (e.g., Please select "B" to show that you have read this question carefully). Participants who responded incorrectly to two or more of these questions were excluded from analyses ($N=6$). Second, GPS data (i.e., latitudinal and longitudinal coordinates) were scanned for repeating coordinates. Multiple responses from identical GPS coordinates may be indicative of robotic devices responding to online surveys.

Cases with identical GPS coordinates were flagged, and data were checked for quality (e.g., nonsensical responses to qualitative questions, completion times under 5 min). Cases with identical GPS coordinates or cases that consisted of poor quality data were excluded from analyses ($N=22$). Finally, participants were asked at the end of the study about whether the researchers should use their data (Yes/No). Two participants responded "No" to this question and so their data were also excluded.

The final sample consisted of 508 women. Participants ranged in age from 19 to 76 years ($M=37.55$) and were in their current relationships for 11.30 years (SD = 9.55). With regard to ethnicity, participants identified as Caucasian/White (80.9%), African (6.1%), Hispanic (6.5%), South Asian (1.0%), Other Asian (1.8%), and Other (2.0%).

Procedure

Participants first read an information letter outlining the study purpose and procedures and then gave their consent to participate. Next, participants completed Part 1 of the study, which began with a background questionnaire followed by measures of sexual satisfaction, relationship satisfaction, and life stress, as well as several questionnaires unrelated to the current study, which were all presented in random order. At the end of Part 1, participants were presented with a feedback letter, which stated that they would be contacted in 24 h to complete Part 2 of the study. In appreciation for their participation, volunteers were given $1.50 (USD) per part of the study for a total of $3.00 for completing both parts of the study. Remuneration was deposited into their Amazon Mechanical Turk account.

After 24 h, participants received an email in their Mechanical Turk account notifying them that they were invited to participate in Part 2 of the study and providing a link to the online questionnaires. Once again, participants were presented with an information letter and provided their consent to participate. Next, they were asked to complete another battery of measures related to sexual and nonsexual communication, sexual desire, attributions for low sexual desire, and sexual functioning, as well as several measures unrelated to the current study, in random order. At the end of the study, participants received a final feedback letter and received $1.50 (USD) in remuneration for their time.

Measures

Demographics

Background Questionnaire This questionnaire asked participants to report basic demographic information regarding their age, ethnicity, and relationship status/length.

Typology Metrics

We used the following measures to test the typology:

Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995) On this measure of sexual satisfaction, participants were asked to rate their satisfaction with their sexual relationship using several 7-point scales with adjective pairs anchored to each end (e.g., Very Bad-Very Good). Scores on the 5-item measure range from 5 to 35 with higher scores showing greater satisfaction with the sexual relationship. In the current sample, this measure showed strong reliability (Cronbach's alpha = .97).

Quality of Marriage Index (QMI; Norton, 1983) This 6-item measure examines overall satisfaction in romantic relationships. Participants indicated the extent to which they agree with 5 items (e.g., "We have a good relationship") on a scale from 1 ("Very Strongly Disagree") to 7 ("Very Strongly Agree"). One additional item asked participants to rate their overall happiness in the relationship on a 10-point scale (1—"Very Unhappy" to 10—"Perfectly Happy"). Scores range from 6 to 45, with higher scores indicating more satisfaction in the relationship. This measure showed excellent reliability in the current sample (Cronbach's alpha = .96).

Social Readjustment Rating Scale (Holmes & Rahe, 1967) This 42-item checklist was created to assess the amount of stressful life events participants have recently experienced. Participants were asked to select each event that occurred in their life over the past year (e.g., marriage, death of a family member, birth of a child). Each event was assigned a weight, called a Life Change Unit (LCU), which indicates the amount of readjustment required to adapt to the event. For example, "Death of a Spouse" would receive an LCU of 100 and "Marriage" would receive an LCU of 50. A total score was created by summing the LCU's for all events selected. This scale has shown strong rank order stability (Gerst, Grant, Yager, & Sweetwood, 1978) and predictive validity (Holmes & Rahe, 1967; Rahe, 1974) in previous research.

The Dyadic Sexual Communication Scale (Catania, 1986) This 13-item questionnaire examined the quality of sexual communication in participants' romantic relationships (e.g., "My partner and I never seem to resolve our disagreements about sexual matters"). Using a 6-point Likert-type scale (1—"Strongly Disagree" to 6—"Strongly Agree") participants indicated how much they agreed with each statement. Scores range from 13 to 78 with higher scores indicating greater communication skill. The measure demonstrated strong reliability in this sample (Cronbach's alpha = .90).

Hurlbert Index of Sexual Desire (HISD; Apt & Hurlbert, 1992) This 25-item questionnaire measures participants' dyadic (e.g., "I look forward to having sex with my partner") and solitary (e.g., "I daydream about sex") sexual desire. Participants rated each item on a 5-point scale

(0–"All of the Time" to 4–"None of the Time"). Higher scores indicate greater sexual desire (range = 0–100). The measure demonstrated excellent reliability in this study (Cronbach's alpha = .96).

Measure Used to Validate Typology

Attributions for Sexual Desire Concerns Questionnaire This measure, which was adapted for the current study from Vannier et al.'s (2018) Attributions for Postpartum Sexual Concerns Questionnaire, assessed explanatory styles for events relating to low sexual desire along four causal dimensions: internal versus external, stable versus unstable, global versus specific, and caused by partner versus not at all caused by partner. Participants were presented with 6 hypothetical events related to sexual desire problems (e.g., "You feel low levels of sexual desire") and asked to write down one major cause of each event and then rate the cause along a 7-point continuum for each of the four causal dimensions. Higher scores indicated greater internal, stable, global, and partner responsibility beliefs. Similar versions of this measure have been validated in previous research (e.g., Jodoin et al., 2011; Vannier et al., 2018). In the current study, reliability coefficients were satisfactory for all subscales: Internal (Cronbach's alpha = .64), Stable (Cronbach's alpha = .78), Global (Cronbach's alpha = .62), and Partner Responsibility (Cronbach's alpha = .76). These reliability coefficients are consistent with prior research using similar measures (Vannier et al., 2018).

Results

Preliminary Analyses

Before conducting our main analyses, we examined descriptive statistics for each of the five core variables included in our typology. Means, SDs, and correlations are presented in Table 1.

Testing a Typology of Women with Low Sexual Desire Using Latent Profile Analysis

We used latent profile analysis (LPA) to determine whether women fell into distinct subgroups based on four key variables that are conceptually and empirically linked to women's sexual desire (relationship and sexual satisfaction, sexual communication, life stress). We additionally included a measure of sexual desire in our analyses (HISD; Apt & Hurlbert, 1992), which allowed us to examine how subgroups of women with lower sexual desire scores differ from subgroups of women with higher scores. LPA is a type of latent variable mixture modeling that aims to identify hidden subgroups, or latent profiles, from a set of observed, continuously distributed variables. The resulting subgroups include cases that are similar to one another in their pattern of responses across variables, but different from the pattern of responses found among cases in other groups. Data were analyzed using Mplus (version 6.12; Muthén & Muthén, 2011).

LPA uses a stepwise approach to identify the smallest number of latent profiles (i.e., subgroups) needed to fully describe the various patterns of associations among variables. To determine the number of profiles that best fit our data, we examined the Lo–Mendell–Rubin likelihood ratio (LMR), a statistical test which examines whether k profiles fit the data better than $k-1$ profiles. We first examined the fit of a 1-profile solution against that of a 2-profile solution. We continued to compare solutions for up to 7 profiles and identified the point at which the addition of a profile resulted in a nonsignificant ($p > .05$) improvement in model fit. In addition, the BIC and Entropy values were examined to inform our selection of profiles to retain. In general, Entropy values that are closer to 1 suggest a better model fit, while BIC values that drop by increments of 10 or more suggest improvements in model fit (Raftery, 1995). Results of the LMR test revealed that a 3-profile solution fit the data significantly better than a 2-profile solution, but the addition of a fourth profile resulted in a nonsignificant improvement in model fit (see Table 2). The BIC and Entropy values suggested that the 5 and 6 latent profile solutions were the best fit for the data, respectively. Therefore, the 3, 5, or 6 latent profile solutions could have been considered

Table 1 Means, SDs, and correlations for the five core variables

Variable	*M*	SD	1	2	3	4
1. GMSEX	26.94	7.95	–			
2. QMI	37.68	8.11	.65**	–		
3. SRRS	151.33	108.33	−.16**	−.18**	–	
4. DSCS	59.92	13.49	.57**	.54**	−.11*	–
5. HISD	56.09	21.89	.44**	.28**	−.14**	.38**

QMI range: 6–45, GMSEX range: 5–35, SRRS range: 0–1466, DSCS range: 13–78, HISD range: 0–100

GMSEX Global Measure of Sexual Satisfaction, *QMI* Quality of Marriage Index, *SRRS* Social Readjustment Rating Scale, *DSCS* Dyadic Sexual Communication Scale, *HISD* Hurlbert Index of Sexual Desire

*Correlation is significant at the .05 level (2-tailed)

**Correlation is significant at the .01 level (2-tailed)

acceptable choices for the final model. The more conservative 3-profile solution was retained as the addition of more profiles did not add particularly meaningful information to the model and also resulted in small subgroups that were not clearly differentiated from other subgroups. Cases were assigned a number (1–3) according to their profile membership. Profile centroids (means across profile members on each of the 5 variables) were plotted using *z*-scores, examined for patterns, and labeled according to their defining characteristics (see Fig. 1). Based on these patterns, the three profiles were labeled as follows: (1) Globally Distressed Group (8.3%), (2) Sexually Dissatisfied Group (24.3%), and (3) Average Desire Group (67.3%). With respect to demographic variables, these groups did not differ significantly in relationship duration or years of education. The only significant difference in age between groups was that the Average Desire Group was significantly younger ($M = 37.06$, SD = 10.92) than the Globally Distressed Group ($M = 41.14$, SD = 10.44), $t(385) = 2.30$, $p = .02$.

Globally Distressed Group

See Table 3 for the LPA results for the 3-profile solution. The most notable characteristics of women in the Globally Distressed Group were relatively low sexual desire and very low relationship satisfaction. Women in this group had the lowest ratings on the Hurlbert Index of Sexual Desire (HISD; $M = 42.81$, SD = 23.0), which were consistent with HISD scores from clinical samples identified in previous research (Mintz et al., 2012). In addition, this subgroup reported extremely low relationship satisfaction ratings on the Quality of Marriage Index (QMI; $M = 16.93$, SD = 5.78) and low sexual satisfaction on the Global Measure of Sexual Satisfaction (GMSEX; $M = 13.52$, SD = 6.64). This pattern of results suggests that women in this group experience diffuse distress that permeates both sexual and nonsexual domains of the relationship. Perhaps unsurprisingly, this group also reported poor sexual communication on the Dyadic Sexual Communication Scale (DSCS; $M = 41.71$, SD = 10.44). This group of women also reported the highest levels life stress on the Social Readjustment Rating Scales ($M = 203.60$, SD = 121.33).

Sexually Dissatisfied Group

See Table 3 for the LPA results for the 3-profile solution. Like the Globally Distressed Group, this group of women reported

Table 2 Fit statistics used to evaluate different numbers of latent profiles

Model	Log likelihood	Free parameters	LMR test (relative to k−1)	*p* value	BIC	Entropy
1 Latent profile	−3141.87	10	–	–	6346.03	–
2 Latent profiles	−2851.93	16	564.77	< .001	5803.54	.89
3 Latent profiles	−2744.59	22	209.09	< .001	5626.24	.89
4 Latent profiles	−2708.78	28	69.76	.15	5592.00	.89
5 Latent profiles	−2677.40	34	61.12	.29	5566.80	.90
6 Latent profiles	−2658.03	40	37.73	.21	5565.28	.91
7 Latent profiles	−2642.33	46	30.58	.54	5571.27	.88

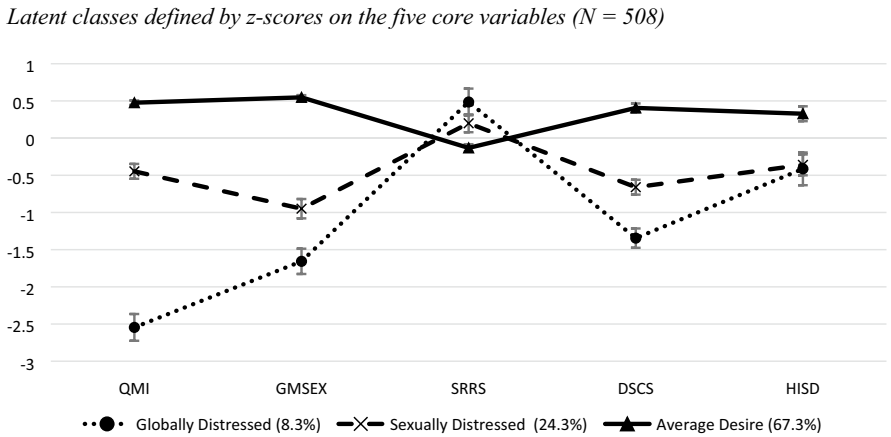

Fig. 1 Latent classes defined by z-scores on the five core variables ($N = 508$). *Note*: Scores on the y-axis are presented as z-scores. *QMI* Quality of Marriage Index, *GMSEX* Global Measure of Sexual Satisfaction, *SRRS* Social Readjustment Rating Scale, *DSCS* Dyadic Sexual Communication Scale, *HISD* Hurlbert Index of Sexual Desire

Note: Scores on the y-axis are presented as z-scores. QMI = Quality of Marriage Index;GMSEX = Global Measure of Sexual Satisfaction; SRRS = Social Readjustment Rating Scale; DSCS = Dyadic Sexual Communication Scale; HISD = Hurlbert Index of Sexual Desire.

Table 3 Estimates of means from 3-profile solution

Variable	Globally distressed			Sexually dissatisfied			Average desire		
	B	S.E.	*p* value	*B*	S.E.	*p* value	*B*	S.E.	*p* value
QMI	−2.55	.18	< .001	−.45	.10	< .001	.48	.03	< .001
GMSEX	−1.66	.17	< .001	−.95	.13	< .001	.55	.03	< .001
SRRS	.49	.18	.008	.20	.12	.082	−.13	.05	.013
DSCS	−1.35	.13	< .001	−.66	.10	.000	.41	.06	< .001
HISD	−.41	.22	.055	−.36	.14	.011	.33	.10	.001

All variables were z-score transformed

QMI Quality of Marriage Index, *GMSEX* Global Measure of Sexual Satisfaction, *SRRS* Social Readjustment Rating Scale, *DSCS* Dyadic Sexual Communication Scale, *HISD* Hurlbert Index of Sexual Desire

low desire levels on the HISD ($M = 44.80$, SD = 21.41) that were similarly consistent with scores of clinical samples from previous research. The primary distinguishing feature of this group was low sexual satisfaction ($M = 19.05$, SD = 5.66), coupled with low average relationship satisfaction ($M = 33.74$, SD = 4.87). As predicted, this pattern of results suggests that this group experiences sexual problems that are primarily confined to the sexual domain. This group also noted low average sexual communication ($M = 51.12$, SD = 11.45) and average life stress ($M = 171.72$, SD = 117.94).

Average Desire Group

See Table 3 for the LPA results for the 3-profile solution. Several characteristics distinguished the Average Desire Group from the two groups of low desire women. First, this group reported higher levels of sexual desire ($M = 61.65$, SD = 19.65) than the two subgroups of low desire women. Mean HISD scores for this group were in line with those of women categorized as having "average" desire levels in previous research (Conaglen & Evans, 2006) which allowed us to use this group as a comparison point for examining how women with higher levels of sexual desire differ from subgroups of women with lower desire. Second, in line with our hypotheses, these women reported the highest sexual satisfaction ($M = 31.34$, SD = 3.68), relationship satisfaction ($M = 41.58$, SD = 3.36), and sexual communication ($M = 65.25$, SD = 10.63). They also reported the lowest life stress of all three subgroups ($M = 137.82$, SD = 100.14).

Profile Comparisons

Globally Distressed Group Versus Sexually Dissatisfied Group

t-tests revealed that women in the Globally Distressed and Sexually Dissatisfied Groups did not differ with respect to sexual desire ($t[159] = -.51$, $p = .61$) or life stress ($t[161] = 1.50$, $p = .14$). However, these groups differed in reports of sexual satisfaction ($t[161] = -5.21$, $p < .001$), relationship satisfaction ($t[161] = -18.34$, $p < .001$), and sexual communication ($t[159] = -4.70$, $p < .001$). Specifically, women in the Globally Distressed Group reported significantly lower sexual and relationship satisfaction, and poorer quality sexual communication than those in the Sexually Dissatisfied Group.

Globally Distressed Group Versus Average Desire Group

Women in the Globally Distressed and Average Desire Groups differed significantly across each of the five variables included in the typology. Overall, women in the Globally Distressed Group reported significantly lower sexual desire ($t[382] = -5.75$, $p < .001$), sexual satisfaction ($t[385] = -26.57$, $p < .001$), relationship satisfaction ($t[385] = -40.81$, $p < .001$), and sexual communication ($t[380] = -13.60$, $p < .001$) than those in the Average Desire Group. The Globally Distressed Group reported significantly greater life stress as compared to the Average Desire Group ($t[385] = 3.92$, $p < .001$).

Sexually Dissatisfied Group Versus Average Desire Group

Women in the Sexually Dissatisfied and Average Desire Groups also differed significantly on all five variables included in the typology. Specifically, women in the Sexually Dissatisfied Group reported significantly lower sexual desire ($t[459] = -7.87$, $p < .001$), sexual satisfaction ($t[464] = -27.15$, $p < .001$), relationship satisfaction ($t[464] = -19.47$, $p < .001$), and sexual communication ($t[457] = -12.24$, $p < .001$) than those in the Average Desire Group. The Sexually Dissatisfied Group also reported significantly greater life stress as compared to the Average Desire Group ($t[464] = 3.05$, $p = .002$).

External Validation

Attributions for Low Sexual Desire

We used the BCH method (Bolck, Croon, & Hagenaars, 2004) as implemented in Mplus to test subgroup differences in attributions for sexual desire concerns. The BCH method tests differences between latent profiles on variables that are external to the

construction of the typology (i.e., variables that do not inform profile membership), using a weighting procedure to account for classification error. This method addresses the problem of underestimation of differences between profiles on external variables that is common among alternative approaches to testing these differences (Vermunt, 2010). We tested differences in each of the four dimensions of the Attributions for Sexual Desire Concerns Questionnaire (internal versus external, stable versus unstable, global versus specific, and caused by partner versus not at all caused by partner).

Omnibus Wald χ^2 tests revealed significant subgroup differences on all dimensions (internal: $\chi^2(2)=13.73$, $p=.001$; stable: $\chi^2(2)=69.23$, $p<.001$; global: $\chi^2(2)=5.86$, $p=.05$; partner responsibility: $\chi^2(2)=66.45$, $p<.001$). Wald χ^2 tests comparing individual profiles revealed that the Globally Distressed Group reported attributions that were significantly more external, $\chi^2(1)=4.65$, $p=.03$, stable, $\chi^2(1)=7.07$, $p<.01$, and blaming of their partner, $\chi^2(1)=11.80$, $p=.001$, than the Sexually Dissatisfied Group. Contrary to expectations, there were no differences in global attributions for sexual desire concerns between the Globally Distressed and Sexually Dissatisfied Group, $\chi^2(1)=1.49$, $p=.22$. The Globally Distressed Group also reported attributions that were significantly more external, $\chi^2(1)=12.17$, $p<.001$, stable, $\chi^2(2)=58.01$, $p<.001$, global, $\chi^2(1)=4.78$, $p=.03$, and blaming of partner, $\chi^2(1)=45.01$, $p<.001$, than the Average Desire Group. The Sexually Dissatisfied Group reported greater stability, $\chi^2(1)=23.09$, $p<.001$, and partner blame, $\chi^2(1)=24.76$, $p<.001$, than the Average Desire Group, but these groups did not differ with respect to global and internal attributions (p's $>.05$).

Discussion

The current study tested a typology of women with low sexual desire by examining group differences in response patterns across sexual, relational, and environmental variables. Our results supported our hypothesis that there are important qualitative differences in women's experiences of low desire and we found support for two specific low desire subtypes. We did not, however, find support for all of the specific subgroups that we had predicted. Below, we first describe the subtypes that we found in our data, followed by a discussion of possible reasons that some of the other subtypes were not present in our data.

Our analyses showed that the women in our sample fell into three subgroups: Globally Distressed Group, Sexually Dissatisfied Group, and Average Desire Group. Two of these groups (Globally Distressed and Sexually Dissatisfied) included women with low sexual desire, and one group included women with average levels of sexual desire. As the aim of this study was to develop and test a typology of women with low sexual desire, we will focus this discussion on the two low desire groups, drawing on results from the Average Desire Group for comparison purposes only.

The most outstanding feature of the Globally Distressed Group was very low relationship satisfaction, along with low sexual satisfaction and poor sexual communication. As predicted, this group showed a diffuse pattern of distress whereby the women in this group showed high levels of relationship dissatisfaction that extends to different domains in their relationships, including the sexual domain. A possible explanation for this pattern is that relationship distress was more primary for this group and may have developmentally preceded their sexual dissatisfaction. However, because the current study was cross-sectional in design, we do not have the data to speak to time sequences or directionality between variables. Follow-up analyses provided clues as to one of the mechanisms that could be contributing to the Globally Distressed Group's experience of distress. Namely, this subgroup reported attributions for their low sexual desire that were significantly more external, stable, and blaming of the partner than the other two groups—a pattern that points to a sense of hopelessness and relational discord. Though the attributions literature has typically shown that internal attributions for negative experiences are associated with negative outcomes (Kindernam & Bentall, 1996; Klein, Fencil-Morse, & Seligman, 1976; Weiner, 1985), in our sample, the more distressed subgroups expressed more external attributions, whereas the Average Desire Group reported the most internal attributions for sexual desire problems. It is possible that viewing sexual desire concerns as caused by internal factors gives women a sense of control and self-efficacy over managing the issue, consistent with past research that shows that implicit beliefs about sexual desire influence how women respond to desire problems (Sutherland & Rehman, 2018). When women perceive sexual desire concerns to be caused by external factors, they may feel powerless to instigate change.

The Sexually Dissatisfied Group presented with issues that were primarily contained to the sexual domain. Women in this subgroup reported quite low sexual satisfaction and communication, but relatively average relationship satisfaction. These results suggest discontent with sexual, but not nonsexual, aspects of the relationship. Contrary to expectations, this subgroup did not differ significantly from the Globally Distressed Group in their attributions of how global versus specific their sexual desire concerns were. However, they also did not differ from the Average Desire Group on this attributional dimension. An examination of means revealed that the Sexually Dissatisfied Group fell between the other two groups with regard to the specificity of their desire concerns, suggesting that this group shared views similar to both satisfied and relationally distressed women on the global versus specific dimension.

Both the Globally Distressed Group and the Sexually Dissatisfied Group reported significantly poorer sexual communication than the Average Desire Group. A large body of research shows that skillful sexual communication is strongly associated with sexual satisfaction in couples' relationships (see review by Rehman, Fallis, & Byers, 2013). It is possible that avoiding discussions of sexual topics, including preferences, dislikes, and concerns, may be one factor that contributes to low sexual desire

in these groups. Indeed, recent work has shown that couples in which the female partner has been diagnosed with Female Sexual Interest/Arousal Disorder have poorer quality sexual communication compared to nonclinical controls (Rosen, Dubé, Corsini-Munt, & Muise, 2019).

Importantly, the Globally Distressed Group and the Sexually Dissatisfied Group did not differ significantly in mean levels of sexual desire. Despite this finding, women in the two low-desire subgroups had distinct presentations, with one group reporting distress in their relationship, including both sexual and nonsexual domains, while the other group's distress seemed to focus more exclusively on the sexual domain of their relationship. This crucial finding highlights that examining mean levels of sexual desire alone may be insufficient for understanding the nature of a woman's desire-related concerns. By examining response patterns across a range of sexual and relational variables, we were able to identify the factors that distinguish between groups of women who share similarly low levels of sexual desire.

Contrary to hypotheses, we did not find a subgroup where high life stress was the defining feature of their low sexual desire. Based on research showing that women with higher stress report lower sexual desire (Bodenmann et al., 2006), we expected that acute life stress would be a primary concern for a subset of women with low desire. Why did this variable not distinguish between women with low desire in our sample? One potential explanation pertains to the measure we used to examine life stress in this study. The Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967) measures acute life stressors that tend to occur relatively infrequently (e.g., death of a loved one, loss of a job). It is possible that examining day-to-day stressors (e.g., work hours, childcare provision) would have better distinguished between subgroups of women with low desire than the rare events listed on the SRRS. Indeed, Murray and Milhausen (2012) found that fatigue is significantly related to low desire in women, a factor that may be more closely tied to common daily stressors than to major life events. A second possible explanation for this pattern of results is that there may be high stress for both of the low desire groups. That is, stress may play a role in low desire, but it may not help us discriminate between the subtypes because it is not a specific marker of any one group. In fact, follow-up analyses showed that women in the two low desire groups did not significantly differ from one another in levels of stress, but both groups had significantly higher life stress (p's $< .01$) than the Average Desire Group. This finding suggests that life stress may play a role in low desire, but it is not particularly useful for discriminating between low-desire subgroups of women.

Though we found a subgroup of women with *average* levels of sexual desire (Average Desire Group), we did not find a parallel group of satisfied women with *low* desire. We had anticipated that one subset of women with low desire would report using positive coping strategies such as strong sexual communication, which we suspected might act as a buffer against sexual and relational dissatisfaction and result in a low-desire subgroup that was satisfied overall. What we found instead was a subgroup of women with *average* levels of sexual desire who reported skillful sexual communication as well as average sexual and relationship satisfaction, but no such group among women with *low* desire. One explanation for not finding a satisfied low desire group is that women who experience low sexual desire, but tend to engage in skillful sexual communication, experience an increase in desire causing them to move out of the low-desire subgroups and into the Average Desire Group with average desire. As this study was cross-sectional in nature, we were unable to clarify whether women move between groups after employing certain strategies to cope with low desire. An important next step for this work will be to conduct longitudinal analyses examining the trajectories that lead women to potentially change group membership over time. In addition, we did not find a unique subgroup of women with high desire. Although some women in our sample reported higher than average desire levels, these women and those with average desire levels shared similar profiles with respect to the five typology variables. Therefore, the women with higher desire levels were subsumed into the Average Desire Group.

It is also noteworthy that we did not find a sexually or relationally dissatisfied group with average desire. Specifically, women who experience sexual and relational dissatisfaction tended to fall into lower desire groups, while those who reported greater satisfaction fell into the Average Desire Group. This finding supports the notion that women's sexual desire is strongly tied to the context of her relationship and that desire tends to be higher when women are content in their partnerships.

This work has several theoretical, empirical, and clinical implications. On a theoretical level, this study suggests that women with low sexual desire differ qualitatively from one another and from women with higher desire. Current conceptualizations of women's sexual desire implicitly place women on a spectrum with high desire on one end and low desire on the other (e.g., Carvalho & Nobre, 2011; Mintz et al., 2012; Murray & Milhausen, 2012). The assumption underlying this conceptualization is that the overall *degree* of a woman's sexual desire is most important for predicting sexual and relational outcomes. While much research supports that mean levels of desire predict key outcomes for women (Brezsnyak & Whisman, 2004; Chao et al., 2011), researchers and clinicians also note that women with low desire appear to be a heterogeneous group (Basson, 2001; Baumeister, 2000). Furthermore, there are significant inconsistencies in the literature on sexual desire discrepancy and relationship variables (e.g., Mark, 2012; Mark & Murray, 2012; Sutherland, Rehman, Fallis, & Goodnight, 2015; Willoughby & Vitas, 2012). This study provides one possible explanation for the observed inconsistencies in the past literature on low sexual desire and desire discrepancies. We have found that women with low desire fall into two distinct groups and that the type of low sexual desire a woman experiences provides additional information that is not captured

by examining mean levels of desire alone. Specifically, our two low desire groups reported nearly identical levels of sexual desire, but the contextual variables surrounding their experiences differed markedly. For example, we found the Globally Distressed Group reported significantly less relationship satisfaction than the Sexually Dissatisfied Group. If we had examined mean levels of desire alone, we might have assumed that these women share a common experience as members of a unitary low desire group.

After further replication and validation of these findings, our typology could be used to examine key predictors and outcomes for women in different low-desire subgroups. It is likely that women in the Globally Distressed, Sexually Dissatisfied, and Average Desire Groups follow unique trajectories into these subgroups. Research shows that relationship stage is negatively correlated with sexual desire in women (Murray & Milhausen, 2012). One potential interpretation of our findings might be that women in each group differ with respect to relationship stage, with women in the Average Desire Group being earlier on in their relationships than women in the Globally Distressed Group. However, our results refute this possibility given that women in the three subgroups showed no differences in relationship duration. Future longitudinal research mapping the course of relationships for women in each subgroup will elucidate the factors that predict group membership and movement between groups. For example, it is possible that most couples begin their relationships in the Average Desire Group, but that specific factors (e.g., communication, conflict management, psychopathology) predict whether women will remain in this group or move into one of the two low desire groups.

We believe that other classifications of sexual desire in women, based on the work done by Dosch et al. (2016) and Leavitt et al. (2019), could be integrated with the typology we have identified in our study. Whereas our work has focused on contextual variables, the typology advanced by Dosch et al. (2016) emphasized the role of psychological traits in shaping an individual's profile of sexual desire and sexual activity, while the classification identified by Leavitt et al. (2019) focused on fluctuations in desire and arousal over the course of a single sexual experience. The focus of these three studies (the current study, Dosch et al., 2016, and Leavitt et al., 2019) is complementary and examining how time course, individual difference variables, such as personality states, and the interpersonal context jointly inform our understanding of women's sexual desire, is an important direction for future work.

Clinically, this work could eventually be used as a basis for developing tailored assessment and treatment protocols for groups of women with low desire. Sex therapists and other professionals treating women with low desire might benefit from assessing which subgroup their clients fit into most closely. Referring back to our earlier example, the sex therapist treating clients Michelle and Claire might conclude that Claire, who cited general dissatisfaction with her romantic relationship, falls into the Globally Distressed Group, while Michelle, who was satisfied with her relationship, but disinterested in sexual activity, fits best in the Sexually Dissatisfied Group. Assessing for these differences could help to inform the case conceptualization and treatment course, and to predict treatment outcomes for these two women. For example, the clinician working with Michelle may choose to begin therapy by exploring her psychosexual history, while Claire's therapist may begin by examining her current relational issues. This work will need to undergo further empirical validation and extension before being translated for clinical use. A particularly fruitful line of inquiry may be longitudinal research that clarifies the pathways that lead to specific group membership. With this knowledge, clinicians can develop more rich and nuanced conceptualizations of presenting desire problems. For instance, if the pathway to membership in the Globally Distressed group suggests that, for this subtype, relational issues spill into the sexual domain over time, couples therapy might be an important initial step in the treatment of sexual desire problems. Although skilled clinicians are trained in the importance of considering context, a stronger empirical basis for the pathways that lead to group membership will provide an empirical foundation for clinical case conceptualization and could aid in the development of prevention efforts by identifying individuals who may be at greater risk for developing sexual desire problems as a result of primary relational discontent.

Consistent with many studies on sexuality in committed relationships, a limitation of the current study is that we employed a community sample of women who reported high average levels of relationship and sexual satisfaction. It is possible that ceiling effects reduced variability in responses from women in our sample. Replicating this work with clinical populations will clarify whether the findings generalize to women experiencing greater relational and sexual dissatisfaction. A second limitation is that this study is cross-sectional in design, which means that we cannot draw conclusions about causality. In future work, we would like to examine the developmental trajectories of each subgroup using a longitudinal design. Further, we acknowledge that two of the fit statistics (BIC and Entropy) reported in our results suggest that additional profiles may exist within our sample. However, retaining a greater number of profiles would have resulted in subgroups consisting of just 2–3% of the total participant sample. We chose to retain the more conservative number of groups that provided the most theoretically meaningful representation of the data. In future research, it would be interesting to recruit a clinically distressed sample of participants in order to determine whether finer discriminations can be made between the identified subgroups.

Conclusions

The current study was the first to develop a typology of women with low sexual desire. We found that women with low sexual desire fall into two groups that are distinguished by key differences in response patterns across variables related to the context of women's romantic relationships. Specifically, the Globally Distressed Group presented with a relationship issue that

permeated both sexual and nonsexual aspects of their relationships as evidenced by extremely low relationship satisfaction and low sexual satisfaction. In contrast, the Sexually Dissatisfied Group's distress appeared to be confined to the sexual domain, as indicated by low sexual satisfaction, but average relationship satisfaction. These distinctions are important for refining current conceptualizations of low desire in women. Our results suggest that women with low desire not only differ qualitatively from women with average desire, but also from one another in meaningful ways. We hope that by elucidating the unique experiences of women with low sexual desire, this research will eventually help to inform assessment and treatment practices for professionals working with women with low sexual desire.

Funding This research was supported by a grant from the Social Sciences and Humanities Research Council of Canada awarded to Uzma Rehman (435-2017-0311) and a Vanier scholarship awarded to Siobhan Sutherland.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by a University of Waterloo Research Ethics Committee (#41380).

Informed Consent Informed consent was obtained from all individual participants included in the study.

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